UNIVERSITY OF NAIROBI

INCENTIVIZING PRIVATE LANDOWNERS FOR THE SUSTAINABLE MANAGEMENT OF WETLANDS IN KENYA: A CASE OF NYANDO WETLAND

BY

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DECLARATION

I hereby declare that this Thesis is my original work and has not been submitted nor is it currently under consideration in any other University or Institution of higher learning.

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DEDICATION

I dedicate this thesis to everyone who committed their efforts towards its successful completion.

Specific dedication to my daughter Zara who in many ways inspired me to believe in myself.

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ABSTRACT

The private land tenure system empowers landowners to exercise autonomy over their land, a situation that has somehow promoted the dominant belief that the utility of wetlands can only be realized by converting them to more productive uses like agricultural production. Private landowners perceive laws and tools meant to promote conservation needs as an infringement on their property rights. Despite the existence of the doctrines of eminent domain and police power as tools for regulating property rights, wetlands in private lands and those adjacent to such lands are continuously degraded as people convert them for agriculture, industrial uses, and human habitation. Nyando wetland is a classic example of the wetlands in Kenya that face serious degradation from private landowners who encroach and convert parts of it for agricultural purposes. The private tenure system has therefore encouraged activities that continue to jeopardize the ecological characteristics of the wetland an indication that there is a need to explore incentives to ensure its sustainable utilization and exploitation. This research investigated how private landowners can be incentivized to ensure that wetlands in Kenya are sustainably managed. The study's objectives were to analyze the extent to which Kenya's legal framework advocates for the use of incentives in the conservation of wetlands; examine challenges that private landowners in Nyando have faced with the current tools for regulating private property rights; analyze the incentives that can be used to encourage private landowners in Nyando to conserve Nyando Wetland and draw experiences and lessons from other jurisdictions on approaches that can be used to incentivize private landowners to ensure the sustainable management of wetlands. The study was conducted in the villages of Kakola-Ombaka location in the Nyando sub-county. Through purposive sampling, a total of 48 villagers and 8 key informants were selected for the study. Data was collected through key informant interviews and Focus Group Discussions (FGDs). The data was then analyzed through content analysis. The findings presented in this study show that private landowners in Kakola-Ombaka engage in unsustainable activities among them overfishing, overharvesting of papyrus reeds, cultivating on the river banks leading to soil erosion and loss of biodiversity. The landowners revealed that they engage in these unsustainable activities due to the deepening poverty that characterizes the Nyando area as well as debilitating floods that destroy their property. As a result, they felt that conservation was too expensive and thus they exploited the wetland resources. Building from the reinforcement theory of motivation, the findings affirmed that private landowners can be pulled towards sustainably managing wetlands by providing them with financial incentives such as loans, stipends, and bursaries for children from child-led families and by providing them with alternative sources of income. This study recommends that to successfully adopt the incentives such as financial incentives in wetland management, there is a need to entrench them into the existing wetland laws, regulations, and policy for successful implementation. The government through its lead agencies should also ensure that private landowners appreciate the value of wetlands through education and awareness programs so that they can willingly take part in conservation.

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5. Phenom Limited v National Environment Management Authority [2005] eKLR.

ACRONYMS

CBD	Convention on Biological Diversity
CRP	Conservation Reserve Program
EIA	Environmental Impact Assessment
ELC	Environment and Land Court
EMCA	Environmental Management and Coordination Act
FAO	Food and Agriculture Organization
FGDs	Focus Group Discussions
HIP	Habitat Improvement Program
IDFG	The Idaho Department of Fish and Game
KIIs	Key Informant Interviews
KWS	Kenya Wildlife Service
LBDA	Lake Basin Development Authority
MEA	Millennium Ecosystem Assessment
NEMA	National Environment Management Authority
NWHSA	National Water Harvesting and Storage Authority
PAS	Protected Areas
PDR	Purchased Development Rights
SDGs	Sustainable Development Goals
UNDP	United Nations Development Programme
VIRED	Victoria Institute for Research on Environment and Development
WCMA	Wildlife Conservation and Management Act

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CHAPTER ONE

INTRODUCTION

1.1: Background Information

Wetlands are indispensable for the countless ecosystem goods and services that they offer humanity ranging from food, supply of freshwater, flood control, climate change mitigation, and groundwater recharge.[1] They are also essential to human well-being, national development, ecological integrity, and the realization of Sustainable Development Goals (SDGs).[2] Due to their unique natural characteristics, they are among the most productive ecosystems in the world comparable only to coral reefs and rain forests.[3] Yet, studies continue to demonstrate that wetland loss and degradation remain persistent problems around the world because their goods and services are not adequately valued by human institutions.[4] This global loss and degradation indicate that managing wetlands is a global challenge that requires concerted efforts hence the formulation of the 1971 Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), one of the first international conservation agreements that promote the global wise use of wetlands.[5]

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[1] Maithya, J., Ming'ate, F., & Letema, S. (2020). A Review on Ecosystem Services and their Threats in the Conservation of Nyando Wetland, Kisumu County, Kenya. *Tanzania Journal of Science*, *46*(3), 711-722.
[2] Ibid.
[3] United States Environmental Protection Agency. Why are Wetlands Important? https://www.epa.gov/wetlands/why-are-wetlands-important
[4] Owuor, J.B., Raburu, P.O. and Kwena, F., 2012. Community based approach to the management of Nyando wetland, Lake Victoria Basin, Kenya.
[5] Kingsford, R. T., Bino, G., Finlayson, C. M., Falster, D., Fitzsimons, J. A., Gawlik, D. E., ... & Thomas, R. F. (2021). Ramsar wetlands of international importance–improving conservation outcomes. *Frontiers in Environmental Science*, *9*, 53. https://www.frontiersin.org/articles/10.3389/fenvs.2021.643367/full?&utm_source=Email_to_authors_&utm_medium=Email&utm_content=T1_11.5e1_author&utm_campaign=Email_publication&field=&journalName=Frontiers_in_Environmental_Science&id=643367

According to Article 1 of the Ramsar Convention, wetlands are;

> "areas of marsh, fen, peatland, or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters."[6]

The definition embraces an enormous variety of habitat types and reveals an enormous amount of resources that people can get from wetlands thus pointing to the need to conserve them. The Convention's main objectives are to halt the global loss of wetlands and to conserve them through wise use and management. To realize these objectives, the convention under Article 2(1) requires parties to set aside suitable wetlands to be included in the List of Wetlands of International Importance and further mandates them to formulate and implement their planning so that they can promote the wise use and conservation of listed wetlands and to promote the conservation of wetlands by establishing nature reserves. Although The Ramsar Convention has been reasonably successful in attracting parties, nearly five decades after coming into force, wetland degradation and loss continue to occur all over the world.[7] For instance, between 1970 and 2015, wetlands have declined by 35%.[8] Global initiatives such as the Convention on Biological Diversity (CBD) and SDGs 6 and 15 increasingly express the persistent degradation of wetlands and the need to

[6] 1971 Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)
[7] Gardner, R. C., Barchiesi, S., Beltrame, C., Finlayson, C., Galewski, T., Harrison, I., ... & Walpole, M. (2015). State of the world's wetlands and their services to people: a compilation of recent analyses. Retrieved from http://biblioteca.cehum.org/bitstream/CEHUM2018/1409/1/Gardner%2C%20Barchiesi%2C%20Beltrame%2C%20Finlayson%2C%20Galewski%2C%20Harrison%2C%20Paganini%2C%20Perennou%2C%20Pritchard%2C%20Rosenqvist%2C%20Walpole.%20State%20of%20the%20World%E2%80%99s%20Wetlands%20and%20their%20Services.pdf
[8] Darrah, S. E., Shennan-Farpón, Y., Loh, J., Davidson, N. C., Finlayson, C. M., Gardner, R. C., et al. (2019). Improvements to the Wetland Extent Trends (WET) index as a tool for monitoring natural and human-made wetlands. *Ecol. Indic.* 99, 294–298. doi:10.1016/j.ecolind.2018.12.032

conserve and sustainably utilize them.[9] Reports indicate that compared to other ecosystems, the damage to and disappearance of wetlands occur at a high speed throughout the world. These initiatives increasingly voice the global menace of wetland loss and degradation and advocate for the need to sustainably utilize and manage them.

Kenya acceded to the Ramsar Convention on October 5, 1990, and ratified it in June 1991[10] and since then it has been duty-bound to meet its obligations among them formulating national laws and policies that ensure their sustainable utilization. For instance, by 2019, Kenya had designated seven Ramsar sites as required under Article 2. They include Lake Nakuru which was listed in 1990, Lake Naivasha (1995), Lake Bogoria (2001), Lake Baringo (2002), Lake Elementaita (2005), and River Tana (2012).[11] Lake Ol' Bolossat became a protected wetland in 2018[12] further indicating the country's commitment to the Ramsar obligations. Kenya has also integrated the obligations of the Ramsar Convention into law and policy to ensure that wetlands are protected and that their goods and services are sustainably utilized. For instance, the Wildlife Conservation and Management Act, 2013 (WCMA) provides clear guidelines for the conservation and management of wetlands under section 33.[13]

As the principal law on wetlands, WCMA works in collaboration with other laws and regulations such as the Environmental Management and Coordination Act, 1999 (EMCA), Environmental Management and Coordination (Wetlands, River Banks, Lake Shores, and Sea Shore Management) Regulations, 2009 and The Sessional Paper No. 12 of 2014 on National Wetlands

[9] Kingsford, R. T., Bino, G., Finlayson, C. M., Falster, D., Fitzsimons, J. A., Gawlik, D. E., ... & Thomas, R. F. (2021). Ramsar wetlands of international importance–improving conservation outcomes. *Frontiers in Environmental Science*, *9*, 53. https://www.frontiersin.org/articles/10.3389/fenvs.2021.643367/full#B4

[10] Shah, P. (2020). Domestication of the Ramsar Convention in Kenya. *Kenya Policy Briefs*, *1*(1), 13-14.

[11] Ibid.

[12] East Africa Natural Historic Society (EANHS). Lake Ol' Bolossat now protected! *Nature Kenya.* https://naturekenya.org/2018/02/28/lake-ol-bolossat-now-protected/

[13] The Wildlife Conservation and Management Act, 2013 No. 47 of 2013.

Conservation Policy (The National Wetlands Policy) to ensure conservation and wise use of wetlands in Kenya. The provisions of these laws work collaboratively to ensure the sustainable management of wetlands in Kenya. For instance, Section 42 of EMCA, 1999 provides for the protection and conservation of wetlands and emphasizes that activities such as excavation, reconstruction, or draining should not be undertaken without the prior and written approval of the Director-General after an environmental impact assessment (EIA).[14] This provision is echoed by EMCA Wetland Regulations, 2009 which provide detailed measures for the management of wetlands and wetland resources in Kenya such as the procedure for declaration of wetlands, permitted uses of wetlands, and the duty of landowners, users, and occupiers in wetland conservation and management.[15] Also, the National Wetland Policy seeks to ensure the sustainable management and wise use of wetlands so that their ecological, social, and economic functions are sustained for the benefit of the present and future generations.[16] These are indications that Kenya has a comprehensive legal and policy framework that is committed to the sustainable utilization and management of wetlands. More importantly, Kenya has a robust Constitution that is committed to the sustainable utilization and management of natural resources. Article 60 (1)(e) emphasizes the principle of sound conservation and protection of ecologically sensitive areas, and wetlands fall under the category of ecologically sensitive areas.

[14] The Environmental Management and Co-Ordination Act (No 8 of 1999). http://kenyalaw.org/kl/fileadmin/pdfdownloads/AmendmentActs/2015/EnvironmentalManagementandCo-ordination_Amendment_Act_2015_No5of2015_.pdf

[15] The Environmental Management and Co-Ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009 (Legal Notice No. 19) http://www.nema.go.ke/images/Docs/Regulations/Wetlands%20regulations-1.pdf

[16] The National Wetlands Conservation and Management Policy, 2015

Wetlands in Kenya cover approximately 3% to 4% of the land surface and thus constitute a critical part of the country's economy.[17] Despite being a signatory to the Ramsar Convention[18] and having a comprehensive legal and policy framework to oversee the sustainable management of wetlands, wetland ecosystems in Kenya continue to face serious threats. Human dependency on wetlands for livelihood and other associated activities such as reclamation for agriculture and settlement, unsustainable harvesting of wetland resources, the introduction of invasive species, pollution, and population growth continue to exert a lot of pressure on Kenya's wetlands.[19] Research indicates that during dry periods, people clear large portions of wetlands to pave way for human settlement, grazing, and cultivation of crops.[20] For instance, conversion of wetlands for agriculture is a major driver of encroachment and ultimate wetland loss and degradation in Kapkatet wetland.[21] As a result, there is a loss of biodiversity, habitats, and breeding grounds for fish. Also, populations around most wetlands continue to grow thus fueling the conversion of wetlands for agriculture, industrial development, and settlements. Issues such as climate change which are major threats to the sustainability of wetlands are exacerbated by unsustainable human activities and inadequacies in legal and policy implementation.

Some of these pressures and threats are attributed to the existing land tenure regimes in Kenya. For instance, a classic example of wetland reclamation and conversion is evidenced in Yala Swamp where a US company Dominion Farms (K) Ltd was authorized by the Lake Basin Development

[17] The National Wetlands Conservation and Management Policy, 2015
[18] Shah, P. (2020). Domestication of the Ramsar Convention in Kenya. *Kenya Policy Briefs*, *1*(1), 13-14.
[19] Maithya, J., Ming'ate, F., & Letema, S. (2020). A Review on Ecosystem Services and their Threats in the Conservation of Nyando Wetland, Kisumu County, Kenya. *Tanzania Journal of Science*, *46*(3), 711-722.
[20] Twesigye CK, Onywere SM, Getenga ZM, Mwakalila S and Nakiranda JK 2011 The impact of land use activities on vegetation cover and water quality in the Lake Victoria watershed. The Open Environmental Engineering Journal 4: 66–77.
[21] Kibet, R., Olatubara, C. O., Ikporukpo, C. O., & Jebiwott, A. (2021). Land Use Land Cover Changes and Encroachment Issues in Kapkatet Wetland, Kenya. *Open Journal of Ecology*, *11*(7), 493-506.

Authority (LBDA) in 2003 to convert a section of the wetland for rice farming through a 25-year lease.[22] The result is that the wetland goods and services have been diminishing leading to loss of biodiversity in the wetland.[23] Also, the Tana Delta which is a Ramsar site faces increased pressures from the conversion of large tracks of land for rice irrigation and the creation of a 43-kilometer long dyke that has significantly affected the ecological integrity of the wetland and interfered with the hydrological cycle of the area.[24] The National Wetlands Conservation and Management Policy, 2015 recognized that the management of wetlands under the diverse Land Tenure System has been a challenge.[25] Some of these challenges are related to land ownership rights and encroachment into riparian areas.[26] For instance, a study of Manguo and Ondiri wetlands in central Kenya revealed that private land ownership contributes to 53% of challenges to the conservation of the swamps.[27]

Nyando Wetland in Kisumu County similarly faces serious degradation from private landowners some of whom have encroached on and converted parts of the Wetland for agricultural purposes.[28] For instance, there is private allocation and farming at the upper parts of the Wetland, a situation that escalates its degradation. It is a large deltaic wetland in Kisumu County found at the mouth of River Nyando and fringing Lake Victoria and is also home to a diversity of organisms that inhabit the various macro habitats that the ecosystem provides. It occurs on the Nyando River basin which

[22] Owiyo, P., Bor, E. K., & Sutter, P. (2014). The effect of Dominion irrigation project on environmental conservation in Yala Swamp, Siaya District, Kenya. *International Journal of Science and Research*, *3*(10), 83-86. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.658.5293&rep=rep1&type=pdf
[23] Ibid.
[24] Abdullahi, G. A. (2016). *Land Use Practices And Their Impacts On Wise Use And Conservation Of The Tana Delta Wetland* (Doctoral dissertation, University of Nairobi). Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/100125/Abdullahi%20_Land%20Use%20Practices%20And%20Their%20Impacts%20On%20Wise%20Use%20And%20Conservation%20Of%20The%20Tana%20Delta%20Wetland.pdf?sequence=1
[25] The National Wetlands Conservation and Management Policy, 2015
[26] Macharia, J. M., Thenya, T., & Ndiritu, G. G. (2010). Management of highland wetlands in central Kenya: The importance of community education, awareness and eco-tourism in biodiversity conservation. *Biodiversity*, *11*(1-2), 85-90. Retrieved from http://www.indiaenvironmentportal.org.in/files/file/wetlands%20central%20Kenya.pdf
[27] Ibid.
[28] Owuor, J.B., Raburu, P.O. and Kwena, F., 2012. Community based approach to the management of Nyando wetland, Lake Victoria Basin, Kenya.

faces serious agricultural stagnation, poverty, and deepening environmental degradation.[29] On a business as usual scenario, the Nyando Wetland communities continue to degrade the Wetland through conversion for agriculture as the need for food production increases. The population of private landowners around the Wetland continues to put pressure on the wetland since human activities tend to disregard environmental protection. The private land tenure system in the Nyando Basin has therefore created numerous problems for the conservation and sustainable management of Nyando Wetland. The situation exposes the complexity of ownership as a right and the extent to which it can advance private interests at the expense of the environment.

Under Article 61(2) of the Constitution, the land is classifieds as public, community or private land characterizes private land as land owned under any freehold tenure, leasehold tenure, or any other land that an Act of Parliament has declared private.[30] Unlike in public tenure and to an extent community tenure systems, the hidden nature of activities under the private and tenure system has awakened the need for more conservation efforts.[31] The private land tenure system empowers landowners through ownership rights to exercise autonomy over their land and this has somehow promoted the dominant belief that the utility of wetlands on private lands can only be realized by converting them to more productive purposes such as agricultural production.[32] According to Honore, ownership which is the greatest possible interest in a thing as recognized by a mature legal system comprises a bundle of rights that encourages private landowners to use their land as they please.[33] They include the rights to possess, use, manage, the right to the income and capital of a

[29] Ibid.
[30] The Constitution of Kenya, 2010
[31] Stern, S. (2006). Encouraging conservation on private lands: a behavioral analysis of financial incentives. *Ariz. L. Rev.*, *48*, 541. Retrieved from https://arizonalawreview.org/pdf/48-3/48arizlrev541.pdf
[32] Odote, C., 2010. *Regulating property rights to ensure sustainable management of wetlands in Kenya* (Doctoral dissertation, University of Nairobi).
[33] Honore, A.M., Ownership, in Oxford Essays in Jurisprudence 107 (A.G. Guest, ed., 1961)

thing, the right to security, the rights of incidents of transmissibility and absence of term, the prohibition of harmful use, liability to execution, and the incident of residuarity.[34] The right to possess is the foundation of the whole structure of ownership since it grants property owners the right to exclude others.

Therefore, a private landowner has exclusive physical control of their land, the right to use it at their discretion, and the right to profit from the land. However, the enjoyment of this bundle of rights is subject to the legal condition that forbids the harmful use of the property to harm other members of society. For instance, the incident that prohibits harmful use of property seeks to ensure that ownership does not become a destructive force. Although a private property owner is subject to prohibitions and limitations by law, the right to use one's property as they wish and the right to exclude others are cardinal features of ownership, and thus in many instances, landowners overlook the wider public interest. As a result, they tend to perceive laws and tools meant to promote conservation needs as an infringement on their right to own property. To many of them, the concept of conservation interferes with their interest in the property. Therefore, most private landowners will only undertake conservation initiatives when they are given incentives, compensation, or when they are compelled by law.

In Kenya, the law provides the doctrines of eminent domain and police power as regulatory tools that can compel private landowners to advance public interests in private property.[35] The doctrine of eminent domain which is also known as compulsory acquisition refers to the right of the state by dint of sovereignty to extinguish any title or interest in land for public use and is subject to

[34] Ibid.
[35] Larkin, J. B. (2011). The Evolution of Constitutional Environmental Law in Kenya. *Kentucky Journal of Equine, Agriculture, & Natural Resources Law*, *3*(2), 6.

prompt payment of adequate compensation.[36] Article 40(1) of the Constitution and Land Act, 2012 provides elaborate guidelines on how to exercise eminent domain. For instance, Art. 40(3)(b) of the Constitution provides that private property can only be acquired for public use and that the use must be weighed against the hardship that the landowner may incur.[37] Police power refers to the power of the state to regulate private property in the public interest such as securing proper resource utilization and management. Unlike eminent domain, it does not extinguish title or interest in land but regulates the use so that the overriding property interests can be vindicated and there is also no payment of compensation. Police power is mainly exercised through land-use legislation which operates on the concept of sustainable utilization of land and land-based resources.

The power of compulsory acquisition and police power can therefore provide the state with useful instruments that can be used to enforce the conservation and sustainable utilization of environmental resources on private lands, this being in the interest of the public. They can ensure that private land ownership does not become a destructive force that only benefits a few at the expense of the public. The regulatory tools recognize that without proper control, private landowners could be a source of widespread environmental harm especially in their quest for productivity at the expense of conservation.[38] For instance, research indicates that agricultural developments and farming practices which are private landowners' major pursuits are a major

[36] Kameri-Mbote, P. (2019). The land Question in Kenya: Legal and Ethical Dimensions. Strathmore University and law Africa.
[37] Migai-Akech, J. M. (2006). Land, the Environment and the Courts in Kenya: Background Paper for the Environment and Land Law Reports, a DFID/KLR Partnership. *Nairobi: UK Department for International Development (DFID) and Kenya Law Reports (KLR), February*.
[38] Stern, S. (2006). Encouraging conservation on private lands: a behavioral analysis of financial incentives. *Ariz. L. Rev.*, *48*, 541. Retrieved from https://arizonalawreview.org/pdf/48-3/48arizlrev541.pdf

cause of wetland loss and degradation.[39] Therefore, the regulatory tools seek to reconcile private property rights and public interests. However, they have not provided a complete solution to the problem of environmental degradation in Kenya mainly because they have not been extensively applied in matters of the environment. In the cases where they have been used, their command and control nature makes them undesirable for many people since they impose stringent and punitive measures on them. For instance, while eminent domain extinguishes title, police power restricts people from fully enjoying their land rights and thus prevents them from benefiting from their land. In many ways, they do not encourage people to conserve and protect the environment and its resources. People need to feel that they can benefit by foregoing their private initiatives by partially or fully undertaking conservation on their lands.

Incentives are the inducements that are designed to make it worthwhile for communities to protect, conserve and maintain natural resources instead of degrading them.[40] Merriam Webster defines an incentive as something that incites or may have a tendency to incite people to action. It, therefore, provides additional compensation so that people can perform well in a given activity. For instance, economic incentives which seek to make it worthwhile for communities to conserve natural resources as they go about their activities emphasize the financial and livelihood terms of those communities. They, therefore, play an important role in the conservation of the environment .at various levels of society.[41] According to the Food and Agriculture Organization (FAO), the livelihood and activities of the communities that are riparian to wetland ecosystems are linked to

[39] Odote, C., Ochieng, B. and Makoloo, O., 2008. The implications of property rights for wetlands management in Kenya. In *12th Biennial Conference of the International Association for the Study of Commons: Governing shared resources: connecting local experience to global challenges, University of Gloucestershire, Cheltenham, England*. Can we us consistent footnoting style

[40] Emerton, L. (2001). Community-based incentives for nature conservation. Retrieved from http://www2.ecolex.org/server2neu.php/libcat/docs/LI/MON-067017.pdf

[41] Ibid.

the exploitation of wetland resources.[42] This shows that when they are properly incentivized, they can promote rational use and conservation of wetland resources. Incentives motivate behavior change in natural resource conservation especially since conservation poses a threatening dilemma for people. For instance, research finds that when it is in the interest of society to exercise collective restrain in their use of a resource, they seldom do so since they are tempted to use as much for their convenience.[43] However, with the introduction of incentives, the social dilemma can be remedied so that people can consider conservation. In Kenya, there has been increased advocacy to use incentives to enhance the protection of natural resources since the explicit directives regarding environmental matters have not been effective.[44]

1.2: Statement of the Research Problem

Wetlands regardless of where they are, are vital resources for the survival of humanity. As unique ecosystems, they provide colossal benefits that capture the social, economic, and ecological needs of humanity. The Ramsar Convention having recognized the global role of wetlands stepped up to promote their wise use globally and rallied parties, Kenya being one of them to ensure the sustainable utilization of wetland goods and services. To this effect, Kenya has organized itself in an attempt to realize the objectives of the Convention by coming up with relevant laws to oversee their sustainable use and management. These laws clearly outline permitted and prohibited uses of wetlands and mandate various agencies to oversee the management of all wetlands. In addition, Kenya has a robust Constitution that can effectively regulate private property rights, including

[42] Owuor, J.B., Raburu, P.O. and Kwena, F., 2012. Community based approach to the management of Nyando wetland, Lake Victoria Basin, Kenya.
[43] Van Vugt, M. (2001). Community identification moderating the impact of financial incentives in a natural social dilemma: Water conservation. *Personality and Social Psychology Bulletin*, *27*(11), 1440-1449. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.459.9692&rep=rep1&type=pdf
[44] Muigua, D. K. (2021). Integrated Natural Resources and Environmental Management for Sustainable Development in Kenya. *Kariuki Muigua & Co Advocates*.

private property, in the interest of the environment. The 2010 Constitution encapsulates the doctrines of Eminent Domain and Police Power as instruments for restricting private land rights and advancing the public good, wetland conservation being one of them.[45]

Despite these elaborate legislative guarantees, wetlands in Kenya such as Nyando wetland are increasingly subjected to indiscriminate destruction, a situation that exacerbates their loss and degradation. More specifically, the existence of a comprehensive framework to regulate private property rights has not controlled the loss and degradation of wetlands under the private land tenure system. Instead, private landowners openly pursue their interests to an extent of encroaching in and converting parts of the sensitive ecosystems for more profitable activities such as farming and settlement. Since the doctrines of eminent domain and police power are command and control in nature, they tend to impose stringent and punitive measures on people, a situation that has encouraged rebellion and therefore challenges in promoting environmental conservation. While the legal framework on wetlands captures the use of incentives, and scholars continuously voice their suitability in wetland management, they have not been fully implemented.[46] Research indicates that there is a need for a more cooperative regulation that will drive behavior change and encourage people on private lands to conserve rather than degrade wetlands.[47] As long as private landowners feel that they do not gain from conserving wetlands, the massive loss and destruction of wetlands will continue.

[45] Veit, P. (2019). Government control of private land use—Kenya. *Gates Open Res*, *3*. Retrieved from http://www.focusonland.com/countries/government-control-of-private-land-use-in-kenya/#:~:text=The%20government%20of%20Kenya%20restricts,state%20or%20a%20designated%20agency.
[46] Muigua, D. K. (2021). Integrated Natural Resources and Environmental Management for Sustainable Development in Kenya. *Kariuki Muigua & Co Advocates*.
[47] Ibid.

Incentives can promote a shift from stringent and punitive measures to more cooperative regulation which will enhance the conservation and sustainable management of wetlands. They promote voluntary compliance and therefore achieve a greater level of environmental protection as compared to command and control mechanisms.[48] Incentives also provide flexibility and can motivate people to devise new mechanisms of reducing environmental harm. As a result, incentivizing private landowners can motivate them to adopt measures that protect wetlands while discarding those that lead to their degradation.

Therefore, the study sought to evaluate appropriate mechanisms to incentivize private land owners and motivate their behavior change and encourage them to conserve rather than contribute to the loss and degradation of wetlands.

1.3: Research Objectives

1.3.1: The Main Research Objective

The main research objective of this study was to investigate how private landowners can be incentivized to promote the sustainable management of wetlands in Kenya. This is to determine the most effective incentives that can encourage private land owners to undertake activities that can promote the sustainable management of wetlands that are located on or adjacent to their lands.

1.3.2: Specific Objectives

To achieve the main objective, this study specifically sought to:

1. To assess the extent to which Kenya's legal framework advocates for the use of incentives in the conservation of wetlands.

[48] Davies, J. C., & Mazurek, J. (2014). *Pollution control in United States: Evaluating the system*. Routledge.

2. To examine the perception of private landowners in Nyando towards the doctrines of eminent domain and police power as regulatory tools for private property rights.
3. To identify and analyze the most appropriate and relevant incentives that can encourage private landowners in Nyando to conserve Nyando wetland.
4. To draw experiences and lessons from other jurisdictions on approaches that can be used to incentivize private landowners to ensure the sustainable management of wetlands.

1.4: Research Questions

1.4.1: The Main Research Question

How can private landowners be incentivized to promote the sustainable management of wetlands in Kenya?

1.4.2: Specific Questions

1. To what extent does Kenya's legal framework advocate for the use of incentives in the conservation of wetlands?
2. What is the perception of private landowners in Nyando towards the doctrines of eminent domain and police power as regulatory tools for private property rights?
3. Which incentives can encourage private landowners in Nyando to conserve Nyando wetland?
4. Drawing from the experiences of other jurisdictions, what lessons can Kenya draw on the approaches to incentivize private landowners for the sustainable management of wetlands?

1.5: Justification of the Study

Wetlands are critical to the attainment of sustainable development and in the realization of the country's blueprint agenda for development, Vision 2030. They perform varied socio-economic

and ecological functions such as climate regulation, groundwater discharge and recharge, water purification, and flood stabilization. Because of this, The Ramsar Convention alongside other national laws, regulations, and policy has recognized the need to sustainably manage and utilize wetlands.

The private land tenure system is central to the sustainable utilization of wetlands debate in Kenya. As a result, there is a need to properly regulate private property rights so that the need to conserve and sustainably manage wetlands is engendered. The main aim of regulating private land tenure is to advance public interests even while promoting the social and economic interests of various landowners. Research indicates that despite existence of a comprehensive regulatory framework for wetlands, they are still subjected to massive destruction hence the need to invest more effort towards the sustainable management of wetlands. Studies show that incentives can help in realizing wetland conservation targets by influencing behavior change.

Nyando Wetland is facing serious threats from private landowners in the form of encroachment and conversion to profitable uses which have significantly interfered with its ecological integrity. It has witnessed biodiversity loss and a reduction in the value of its ecosystem goods and services. The private landowners in the Nyando basin are pursuing their interests at the expense of the environment, a situation that jeopardizes the concept of sustainable management. The study appreciates the central role that the private land tenure system plays in conservation by focusing on its impact on the sustainable management of wetlands and how private landowners can be encouraged to conform to conservation initiatives.

The study will be a useful reference material to government agencies such as NEMA and policymakers on how people can be properly incentivized to consider conservation imperatives on

private lands. It will be useful to students of environmental law and policy and other relevant stakeholders and it may also influence policy and legal change.

1.6: Analytical Framework

1.6.1: Theoretical framework

The study is based on the reinforcement theory of motivation which was developed by Burrhus Frederic Skinner, an American Professor of Psychology at Harvard University in 1957. This is one of the oldest theories of motivation that explains human behavior. The theory is extensively taught in psychology where it is also known as behaviorism or operant conditioning. It is also widely used in business and management to motivate good behaviors among employees in the workplace.

Reinforcement refers to various rewards that are used to encourage good behaviors and punishments that are used to reduce bad behavior. The theory, therefore, suggests that people's behaviors are motivated by the desire for reinforcement or rewards. This means that people are generally pulled towards behaviors that lead to rewards and pushed away from actions that can lead to negative reinforcements.[49] The rewards can also motivate people to do things that they would otherwise find unpleasant.

The theory is anchored on the principle of cause and effect and maintains that a person's behavior is regulated by the type of reward they get. For instance, it states that when people are rewarded for positive behavior, their positive behavior is reinforced and when they are punished for negative behavior, the behavior is weakened. Skinner maintains that an individual's behavior is a function of its consequence. According to Gordan and Krishanan (2014), motivation is a concept that refers

[49] Stern, S. (2006). Encouraging conservation on private lands: a behavioral analysis of financial incentives. *Ariz. L. Rev.*, *48*, 541. Retrieved from https://arizonalawreview.org/pdf/48-3/48arizlrev541.pdf

to the forces that act within or on an organism to direct or initiate a specific behavior.[50] Therefore, the reinforcement theory of motivation concentrates on the behavioral changes that occur in people when they are subjected to different forms of motivation.

Skinner states that there is a need to effectively and positively design the external environment to motivate people. It forms a strong tool for analyzing the controlling mechanism for people's behaviors. It also explains in detail how people learn a behavior and how they can be motivated. For instance, in management, managers are encouraged to tell their employees what they are doing correctly so that their positive behavior is enhanced. Through Skinner's thoughts on adjusting motivation through various stimuli, people can gain a better understanding of human behavior.

From the theory, three interesting points emerge. First, is that incentives can be used to enhance people's engagement in positive activities and behaviors and they can also be invoked to stop their engagement in negative activities. The second is that incentives can be powerful and effective when people place importance on the reward. Third, rewards should be obtainable to be motivating. For instance, when assigned tasks for receiving a reward are not realistically achievable, people cannot be motivated.

This theory applies to the study in that it can be used to effectively analyze and understand how incentives can be used to promote the sustainable utilization and management of wetlands. For instance, the theory shows that when people place importance on the rewards they get for sustainably utilizing and managing wetlands, that behavior can be enhanced while at the same time discouraging behaviors that encourage wetland loss and degradation. The theory, as applied to the

[50] Gordan, M., & Krishanan, I. A. (2014). A Review of BF Skinner's 'Reinforcement Theory of Motivation'. *International Journal of Research in Education Methodology*, *5*(3), 680-688. Retrieved from https://d1wqtxts1xzle7.cloudfront.net/56471035/

current study demonstrates that with the right incentives, private landowners can be pulled away from unsustainable activities such as overharvesting of wetland goods and services, the indiscriminate exercise of ownership rights, encroachment, and conversion of wetlands that are detrimental to the survival of wetlands. It can therefore be used to affirm that reinforcements or rewards can motivate private landowners through behavior change to consider conservation and sustainable management of wetlands; initiatives that would otherwise seem unpleasant since they hinder the full enjoyment of their property rights.

1.6.2: Conceptual Framework

The conceptual framework is based on incentivizing private landowners in Nyando and how incentives can promote the sustainable management of the wetland's ecosystem. Currently, the private land ownership in Nyando has led to numerous challenges for the sustainable utilization of the wetland's goods and services. Actions of the landowners such as unsustainable harvesting of the wetland's resources like papyrus, clearance of large portions of the wetland to pave way for the cultivation of crops, unsustainable farming practices, and the use of fertilizers on nearby farms that wash into the wetland, and encroachment define some of the threats that have been influenced by private land ownership. In Nyando, the people are also contending with high incidences of poverty which encourages the unsustainable use of the wetland.

Because ownership accords people the right to use and manage and the right to the income of the property, the private landowners in Nyando are not likely to undertake any deliberate efforts to conserve and sustainably utilize the wetland. Under such scenarios, the government may invoke the doctrines of eminent domain or police power to ensure the conservation of the wetland in the interest of the public. However, given the command and control nature of the eminent domain and police power, they would impose stringent and punitive measures on the landowners that would

either extinguish their title to land or deter them from enjoying their full property rights respectively.[51] The result is deep-rooted grievances that advance the degradation and may ultimately lead to the loss of the wetland.

Incentives as opposed to the command and control measures will offer more certainty that the private landowners will undertake conservation efforts on their lands. Research agrees that incentives can be powerful tools that encourage people to rethink and reform their behaviors towards the environment and this can reduce the wholesale destruction of the environment.[52] Incentive measures such as direct financial assistance, government support for sustainable farming, alternative sources of income, and government involvement in flood control initiatives through the building of dykes can significantly influence behavior change among private land owners in Nyando. Coupled with interventions such as improvement in income levels and implementation of existing wetlands laws, the consequence of applying these incentive measures will be sustainable harvesting of wetland goods and services, reduced cultivation on the wetland, reduced encroachment, and sustainable fishing. Ultimately, a sustained incentivization of private land owners in Nyando will lead to the sustainable management of Nyando wetland. Figure 1 illustrates the conceptual framework.

[51] Babich, A., 'Understanding the New Era in Environmental Law,' op. cit, p.375; See 'Chapter xv. Regulatory And Economic Instruments For Solid Waste Management,' UNEP Division of Technology, Industry and Economics (DTIE), Available at http://www.unep.org/ietc/Portals/136/SWM-Vol1-Part4.pdf
[52] Ibid

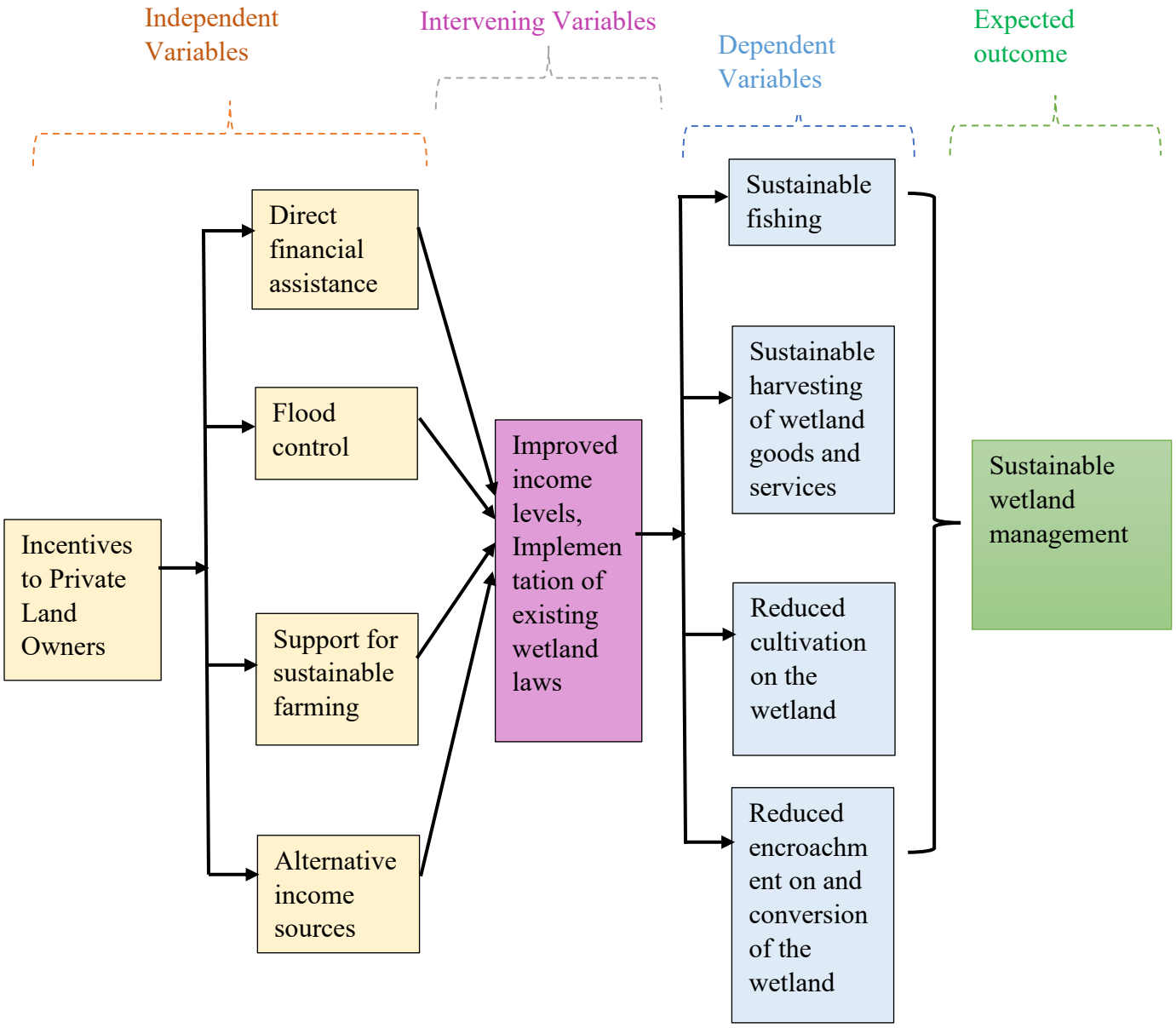

Figure 1: Conceptual Framework

1.7: Thesis Outline

The study is grouped into five chapters. The introductory chapter provides the background to the study, a summary of the problem that the study investigates, the research objectives and questions, and also outlines the theoretical basis of the study and the conceptual framework. The conceptual framework shows that incentivizing private landowners is linked to the sustainable management of wetlands since it promotes behavior change and therefore a shift from unsustainable to sustainable activities.

In chapter two, key literature that informs the study is analyzed and gaps that the study seeks to fill are identified and explained. The literature is organized around five major themes namely; the link between private land tenure and the sustainable management of wetlands, limitations of eminent domain and police power in regulating private land use in Kenya, incentives for the conservation of wetlands, the value of Nandi Wetland to surrounding communities and assessment of Kenya's legal framework on wetlands. The chapter concludes that there lacks a comprehensive study on how private land owners can be incentivized to ensure the sustainable management of wetlands in Kenya.

Chapter three provides the research methodology of the study. It describes the study area in detail and the research design that the study adopted as well as the methods of data collection. It also presents the ethical considerations in the study and the limitations of the research. Chapter four presents the results in detail and offers a succinct analysis and discussion of the results. The results will show the measures that can be used to incentivize private landowners in Nyando to ensure the sustainable management of the wetland and thus answer the main objective of the study. This will be supported by results on the perceptions of the private landowners on the doctrines of eminent domain and police power. The discussion section will, following the research objectives seek to

demonstrate the extent to which incentivizing private landowners can ensure that wetlands in Kenya are sustainably managed, the extent to which Kenya's legal framework advocates for the use of incentives in the conservation of wetlands and the lessons that Kenya can learn from the United States and Australia given that the two jurisdictions have a history of success with incentives in wetland conservation.

Chapter five provides the conclusion and recommendations of the study. The chapter establishes that indeed incentives can ensure the sustainable management of wetlands in Kenya and makes appropriate recommendations that are geared towards ensuring the sustainability of wetlands through incentives.

CHAPTER TWO

LITERATURE REVIEW

2.1: Overview

The literature review enabled the researcher to contextualize the research problem and also supported the discussions arising from the findings. The materials that were reviewed stemmed from the study's central focus which was to investigate the ways of incentivizing private landowners given the limitations of the two regulatory tools; eminent domain and police power. This section discusses the link between private land ownership and wetland conservation, eminent domain, and police power as well as their limitations in regulating private land use in Kenya, literature on incentives for the sustainable management of wetlands, literature on the value of Nyando wetland, and Kenya's legal framework and how it regulates wetlands in the private tenure system and the research gaps. A discussion around these themes provided more clarity on the study by explaining how the private land tenure system contributes to the unsustainable utilization of wetlands, and how eminent domain and police power have provided an incomplete solution in natural resource management and thus would be ineffective in the sustainable management of wetlands. These themes also helped the study to justify the use of incentives as an alternative to the command and control measures in realizing the sustainable management of wetlands. A discussion on the value of the Nyando wetland further validated the reason for choosing it as a case study for the research.

2.2: The Link Between Private Land Tenure and the Sustainable Management of Wetlands

The ecological value of private lands and the unending land use conflicts make private land stewardship a critical issue in environmental policymaking.[1] With most conservation efforts channeled to public lands, society is currently grappling with the costs of reducing environmental impacts from individual landowners. Given the hidden nature of activities on private lands, even traditional regulatory tools cannot provide a complete solution. As a result, there is a growing need to consider a more holistic approach that conserves biodiversity irrespective of ownership. Although it is unlikely that the private land tenure can sufficiently meet conservation needs, it can substantially contribute to the sustainable management of natural resources such as wetlands.[2]

Studies show that individual landowners play a pivotal role in the preservation of biodiversity, conservation, and management of wetlands. Like wildlife, the majority of wetlands occur on privately owned land rather than publicly owned land hence private lands are integral in wetland conservation.[3] According to the Wetland Policy, 2015, over 80% of Kenya's wetlands occur outside protected areas thus making them vulnerable to degradation from unsustainable human activities. Private landowners tend to take up agricultural developments that threaten biodiversity such as farming which can be destructive to the soil. Studies show that farming leads to challenges such as non-point pollution and soil erosion.[4] Also, some of the activities of private landowners are associated with fragmentation of land and thus accelerates land degradation which negatively

[1] Stern, S. (2006). Encouraging conservation on private lands: a behavioral analysis of financial incentives. *Ariz. L. Rev.*, *48*, 541. Retrieved from https://arizonalawreview.org/pdf/48-3/48arizlrev541.pdf

[2] Kamal, S., Grodzińska-Jurczak, M., & Brown, G. (2015). Conservation on private land: a review of global strategies with a proposed classification system. *Journal of Environmental Planning and Management*, *58*(4), 576-597.

[3] Morrisette, P. M. (2001). Conservation easements and the public good: preserving the environment on private lands. *Natural Resources Journal*, 373-426. Retrieved from https://digitalrepository.unm.edu/cgi/viewcontent.cgi?article=1566&context=nrj

[4] Ruhl, J. B. (2002). Farmland stewardship: Can ecosystems stand any more of it. *Wash. UJL & Pol'y*, *9*, 1. Retrieved from https://ir.vanderbilt.edu/xmlui/bitstream/handle/1803/7332/Farmland_Stewardship.pdf?sequence=1&isAllowed=y

impacts the sustainable management of wetlands.[5] In Kenya, through the tool of EIA, several land users have been restricted in the interest of protecting the environment. For instance, in May 2013, a Kenyan court ruled in favor of the National Environment Management Authority (NEMA) by upholding an order that prevented a leaseholder from constructing a camp and a tourist lodge outside the Maasai Mara Game Reserve.[6] The order was meant to protect local wildlife and a nearby Cheetah breeding ground.

According to Patricia Kameri-Mbote, private property rights to land should be subordinate to the need to conserve and sustainably manage natural resources.[7] However, she observes that this can only be realized through cooperation between landowners and the government. Kameri-Mbote notes that servitudes can be used to ensure that private property rights engender sustainable management of natural resources such as wildlife. Some of the servitudes which are recognized under Kenyan laws on property rights include restrictive covenants, easements, and profits. These discussions point to the central role of private land tenure in the sustainable management of natural resources, in this case, wetlands.

However, integrating private landowners into conservation and management planning is very complicated considering the economic and social factors that are related to its use. The constitutional entrenchment of private property rights further complicates the matter. This is because biodiversity exhibits the characteristics of public goods and thus there is very little incentive for individual landowners. Also, top-down approaches to conservation on private lands

[5] Kasimbazi, E. (2017). Land tenure and rights for improved land management and sustainable development. UNCCD: Bonn, Germany.
[6]Veit, P. (2019). Government control of private land use—Kenya. *Gates Open Res*, *3*. Retrieved from http://www.focusonland.com/countries/government-control-of-private-land-use-in-kenya/
[7] Kameri-Mbote, P. (2005). Land tenure, land use and sustainability in Kenya: Towards innovative use of property rights in wildlife management. Retrieved from http://www.ielrc.org/content/w0504.pdf

have not been effective since landowners express their unwillingness to engage in conservation initiatives that provide little or no benefits to them.[8] This is the reason why strategies related to conservation on private lands are being explored from other prescriptions.

From the foregoing, the sustainable management of wetlands is intricately linked to the private land tenure system. According to Odote, Ochieng, and Makoloo (2008), private land tenure ignores wider societal interests and thus presents huge shortcomings in the sustainable management of wetlands.[9] This is mainly because wetlands exhibit public good characteristics and with the traditionally led government involvement, there is little incentive to encourage the sustainable management of wetlands on private lands.[10] Also, from the experience of wetlands such as Yala Swamp and the Tana Delta, it is evident that private land tenure can contribute to both degradation and the conservation of wetlands.

2.3: Limitations of Eminent Domain and Police Power in Regulating Private Land Use in Kenya

In most Kenyan communities, wealth is measured in terms of the land owned and such ownership gives people a sense of prestige and identity among their peers. As a result, when it comes to losing even a piece of the land, there will be a lot of resistance. Also, the Kenyan economy is predominantly agrarian hence people heavily rely on the land for agriculture.[11] Under such a scenario, the exercise of regulatory tools such as police power and eminent domain is fairly

[8] Ibid.
[9] Odote, C., Ochieng, B., & Makoloo, O. (2008). The Implications of Property Rights for Wetlands Management in Kenya. In *12th Biennial Conference of the International Association for the Study of Commons: Governing shared resources: connecting local experience to global challenges, University of Gloucestershire, Cheltenham, England*.
[10] Kamal, S., Grodzińska-Jurczak, M., & Brown, G. (2015). Conservation on private land: a review of global strategies with a proposed classification system. *Journal of Environmental Planning and Management*, *58*(4), 576-597.
[11] Alila, P. O., & Atieno, R. (2006). Agricultural policy in Kenya: issues and processes. A paper for the future agricultures Consortium Workshop, Institute of Development Studies, 20–22 March 2006. Retrieved from http://www.fao.org/fileadmin/user_upload/fsn/docs/Ag_policy_Kenya.pdf

delicate. This is because people view the application of such regulatory powers as an infringement of their property rights and this has greatly impeded the successful exercise of the powers. There are also contentious procedural issues around their application with some focusing on interpretation.

2.3.1: The Doctrine of Eminent Domain

Although the doctrine of eminent domain by its nature runs against the foundations of the concept of property as described as Honore, research indicates that the conservation community has tended to support it despite its consequences and procedure. However, an emerging rank of conservationists are skeptical of the traditional position of eminent domain arguing that it fails to deliver its stated goals and promises especially in regards to the conservation of natural resources.[12] In addition to this, there are several other impediments to the use of the eminent domain in regulating private land use in Kenya.

One of the impediments to the exercise of the doctrine of eminent domain is the constitutional entrenchment of private property rights. By entrenching the sanctity of private property in the constitution, the government accords the right to considerable inviolability that places owners beyond the reach of any other law, policy, or practice. Moreover, the supremacy of the Constitution trumps any other existing laws and elevates the position of the private landowner. Sifuna states that Kenyan law confers landowners' usufruct and proprietary rights over their lands.[13] Based on this, the landowners have indefeasible and absolute proprietorship rights to own and use their land

[63] Institute of Law and Environmental Governance (ILEG). (2020, October 19). The Use of Powers of Eminent Domain in Kenya. *Linking Environment, Governance and Sustainable Development*. Retrieved on August 13, 2021, from https://ilegkenya.org/2020/10/19/the-use-of-powers-of-eminent-domain-in-kenya/

[13] Sifuna, N. (2009). Public regulation of the use of private land: Opportunities and challenges in Kenya. *Law Env't & Dev. J.*, *5*, 38. Retrieved from http://docs.manupatra.in/newsline/articles/Upload/37A5C53F-8398-4AEB-A0FC-F19CD50B9FDD.pdf

as they wish. Due to the existence of this right, the government's efforts to acquire lands for conservation purposes have been previously perceived as a violation of the rights. People also develop negative attitudes towards eminent domain thus thwarting all efforts to realize its goals and promises in the interest of the public. For instance, past enactments such as the 1968 Forest Preservation Policy, the Nyayo Tea Zones, and the National Food Policy which were deemed valuable to the economy enabled the government to exercise eminent domain and in the process took land from communities that relied on the land for subsistence and identity reasons. One of the people's main concerns was inadequate community involvement in the process. All the attempts to involve the affected communities in the allocation and in addressing any other grievances that may have arose from the exercise of eminent domain fell short and instead people developed negative attitudes towards the government's efforts to conserve the environment. These issues point to several contentious issues that arise from the government's application of eminent domain, and given the inviolability of the right to own property in Kenya, they present some of the issues that have impeded the government's conservation efforts through eminent domain.

Also, the circumstances under which the government may exercise the power of eminent domain are expressly stated under article 40(3) of the Constitution and part VIII of The Land Act, 2012. Under these laws, the government may only compulsorily acquire private lands when such an acquisition is in the public interest after which prompt payment in full and of just compensation is made to the owner. Although these issues are clearly explained in law, the discussions around the application of eminent domain present contentious legal issues. For instance, the law, on one hand, guarantees its people with the right of private ownership and on the other hand turns around to

expropriate the property sometimes against the will of the landowner.[14] To many people, this is akin to giving with one hand and taking with the other hand, a situation that is not acceptable among many.

The application of the doctrine of eminent domain in Kenya can be traced to wildlife conservation and management in which the government established protected areas (PAs) in line with its international obligations towards environmental conservation efforts. History records that the establishment of the first PAs was marred by forceful displacement of natives and a lack of compensation for their land that had been appropriated for conservation purposes.[15] Although the procedure for the application of eminent domain has changed over the years, there are unresolved legal issues that have impeded its success especially in regards to environmental conservation and management. With the expansion of democratic space, there is more emphasis on good governance when it comes to matters of land use and the application of eminent domain. However, governance is deemed unsuccessful and draconian without effective consultation and public participation, issues that form part of the legal contentions surrounding the exercise of eminent domain.[16]

One of the conditions that are set out in law for the exercise of eminent domain which focuses on public use does not expressly list environmental protection or conservation as one of the public uses for which private land may be acquired. This is a great omission that should have been considered especially in the age where the constitution recognizes sustainable development as a principle of governance. The fact that the conditions of eminent domain do not make express

[14] Sifuna, N. (2006). Using eminent domain powers to acquire private lands for protected area wildlife conservation: a survey under Kenyan law. *Law Env't & Dev. J.*, *2*, 84. Retrieved from http://docs.manupatra.in/newsline/articles/Upload/ADA844CE-D0C3-46E4-BAE5-C3B79F71E1AA.pdf
[15] Ibid.
[16] Veit, P. G. & Larson, G. (2013, March). Police Powers and Environmental Management: Experiences from East Africa—DRAFT REPORT. Retrieved from http://www.abcg.org/action/document/show?document_id=572

provision for the conservation of the environment makes it difficult for private land to be compulsorily acquired for that purpose. For instance, in *Niaz Mohamed Jan Mohamed v The Commissioner of Lands & 4 others* the court held that the government has no right to compulsorily acquire private land other than for the reasons provided for by the Constitution.[17] This shows that the omission of environmental protection as one of the reasons for compulsory acquisition may present legal impediments in its application.

These factors show that the exercise of eminent domain to secure the sustainable management of wetlands on private lands or those adjacent to private lands may equally elicit negative attitudes from people who may deem it unfair and an infringement on their constitutional right to own property. The procedure around the exercise of eminent domain presents legal contentions that would impede efforts towards the sustainable management of wetlands. For instance, even if the government would compulsorily acquire private lands for the conservation of wetlands, they would still require public cooperation to realize the goals of conservation. However, when the public has a negative attitude towards the government's efforts to conserve wetlands, the exercise of eminent domain may not be effective. The factors also attest that while eminent domain may be used to advance conservation initiatives on private property, it may not offer a sustained solution since private landowners feel that conservation is an expensive initiative that does not benefit them individually.

A classic example that reveals legal contentions and complexities surrounding the exercise of eminent domain is *Dorcas Matoke v Attorney General & 2 others* in which the plaintiff itemized several issues among them failure of the government to make due compensation even after a

[17] Niaz Mohamed Jan Mohamed v The Commissioner of Lands & 4 others [2003] eKLR

valuation of the land and thus sought an order restraining the defendants from encroaching into her property and interfering with her quiet enjoyment.[18] This case indicates the complexities of exercising eminent domain in Kenya and demonstrates its inability to secure the sustainable management of wetlands through cooperation. Although the court ruled that the plaintiff failed to show that the government had contravened the Constitution in its exercise of eminent domain, it is one of the cases that criticizes the suitability and acceptability of eminent domain in ensuring the sustainable management of wetlands in Kenya.

2.3.2: The Doctrine of Police Power

The doctrine of police power also referred to as development control is enshrined in Article 66(1) and (2) where the Constitution provides for land use and property regulation. Article 261 and the Fifth Schedule also empower parliament to enact police power regulation within five years to secure public interests. More specifically, the application of police power traces back to the British colonial government which routinely exercised it for environmental outcomes such as soil and wind erosion. Until independence, they forced the villagers to construct terraces on their farms and to reduce the number of livestock and in many instances, colonial officers carried out such activities without notifying the local people. In Kenya, people resisted these practices since they interrupted their livelihood and traditional resource use.[19] These activities fueled grievances against the British and their forced conservation practices and the application of police power to protect the environment significantly contribute to many independence movements in Kenya. The resistance to conservation efforts has persisted to date especially among private landowners who would rather pursue profitable activities on their lands.

[18] Dorcas Matoke v Attorney General & 2 others [2018] eKLR. http://kenyalaw.org/caselaw/cases/view/160556
[19] Veit, P. G. & Larson, G. (2013, March). Police Powers and Environmental Management: Experiences from East Africa—DRAFT REPORT. Retrieved from http://www.abcg.org/action/document/show?document_id=572

Although the use of police power has changed over the years and governments exercise it in the form of EIAs and environmental easements, it has not been fully enforced due to political pressure, weak institutional capacity, community and developer resistance, and a lack of public awareness.[20] In Kenya, there are concerns over the adverse implications of the exercise of police power on the wellbeing and livelihoods of people. Many individuals and private companies have sued the government for lost economic opportunities and demanding to be compensated. However, in many instances, the courts have upheld the government's decision to protect the environment for public interest thus fueling negative attitudes among people. Some of the tools and instruments that the government of Kenya uses to exercise the doctrine of police power include; EIAs, conservation orders, land use planning, land preservation orders, and zoning.

Experts believe that the exercise of police power to conserve the environment will improve in the future given the debilitating effects of climate change and the accelerating nature of investments and economic development. Research indicates that there is a greater agency for governments to efficiently use such authorities to protect the environment. In Kenya, despite the constitutional entrenchment of police power and the damaging anthropogenic effects on the environment, the procedure for its application is not comprehensive enough. Moreover, it is currently scattered in various statutes such as EMCA, Water Act, Agriculture, Fisheries Act, and the Penal Code. For instance, under EMCA, the law allows restrictions on land use to ensure environmental protection in the name of pollution control, water, and wildlife protection. It achieves these through EIA which ensures that development projects do not negatively impact the environment. Section 112

[20] Ibid.

of EMCA also allows courts to grant conservation orders to protect resources such as water and sensitive geographic features.

Land use planning is another instrument that the government uses to exercise police power. Through the Physical Planning Act, the government can control developments on land through land-use planning at various levels. Through this Act, non-governmental actors such as chiefs have the authority to restrict private land rights by regulating the use of water and restricting the cutting of trees. The Agriculture Act allows for the exercise of police power through the issuance of land preservation orders against landowners or occupiers of land. The orders can restrict the landowners from carrying out activities that are detrimental to the land or the environment. Zoning which refers to a standard approach to control land use is also an instrument that the government uses to exercise police power. It specifies the allowable land uses or restricts development to protect the environment.

Apart from the scattered nature of police power, most of the laws provide unclear guidelines for its exercise. For instance, EMCA does not provide clear procedures for who may request conservation orders and when they should be granted thus leaving a lot of discretion to the requesting authority and the presiding judge. Also, EMCA spells out procedures for carrying out EIAs such as public participation and access to information all of which have been the basis for most cases that argue against the effectiveness of EIA in protecting the environment. Unlike conservation orders, EMCA does not provide guidance for the list of permitted purposes for environmental easements thus provides little discretion as to when an easement should be granted. Without formal and comprehensive guidance for the exercise of police power, its application in the sustainable management of wetlands may be problematic and inefficient. The current laws

empower various authorities to guide the exercise of police power in the interest of the environment.

In many instances, the authorities' exercise of power results in inconsistencies which create risks and uncertainties for many landowners.[21] For instance, while the government has invoked police power on several occasions such as in *Phenom Limited v National Environment Management Authority* where the government restricted a private landowner to develop a maximum of four flours instead of eight[22] and in *A. T. Kaminchia v. National Environment Management Authority and M/S Bell Ways Garden Limited* where it restricted a private landowner's development by requiring it to adhere to the six-meter riparian reserve of River Kirichwa Kubwa[23] without any arising claims for compensation, several claims have since arisen thus pointing to challenges in exercising the doctrine of police power's. In *Malindi Green Town Movement & Another v. NEMA, Silversand Camping Site Ltd. & Another* when the government through the National Environment Tribunal stopped the construction of two luxury villas by a private developer, the situation led to the emergence a claim of a regulatory nature. An appeal filed against the Authority argued several issues among them the flawed nature of approving licenses, illegal acquisition of land, and inadequate public involvement in the process of approving the development.[24] In response, the investor argued that the Constitution guaranteed him the right to utilize his land and that this right was being infringed on by the parties that sought to stop the development of the land and later filed for a judicial review application in the High Court. The case encouraged the emergence of similar

[21] Veit, P. G. & Larson, G. (2013, March). Police Powers and Environmental Management: Experiences from East Africa—DRAFT REPORT. Retrieved from http://www.abcg.org/action/document/show?document_id=572
[22] Phenom Limited v National Environment Management Authority [2005] eKLR. http://kenyalaw.org/caselaw/cases/view/44852
[23] 4. A. T. Kaminchia v. National Environment Management Authority And M/S Bell Ways Garden Limited [2006] eKLR.
[24] Jane, D. (2013). International Takings: Emergence of Takings Litigation in Kenya. *Hastings W.-Nw. J. Envt'l L. & Pol'y*, *19*, 445.

claims since investors wanted to avoid the regulatory limitation on their development activities. Similar cases later revealed the discontent among private landowners regarding the exercise of police power with many asserting that they have a constitutional right to use their lands and the government needed to pay them for stopping their commercial utilization of land.

2.4: Incentives for the Conservation of Wetlands

The proper administration of incentives for the conservation of the environment considers three main landowner concerns namely, voluntary participation, maintained privacy, and a recognition of their stewardship towards land.[25] Voluntary participation, as opposed to command and control mechanisms such as zoning, is likely to encourage private landowners to cooperate and work towards environmental conservation. Most landowners also prefer to maintain their right to exclude others from their property and thus strategies and policies that do not alter or split their property rights are more effective at encouraging conservation. More importantly, successful incentive programs should recognize and acknowledge the stewardship efforts by landowners to enhance the habitats on their land. According to Shelton, incentive programs should increase conservation and public profit without infringing on landowners' rights thus affirming the need to adhere to the aforementioned factors when designing successful incentive programs for the conservation of wetlands.[26] Shelton further notes that incentives can take the form of tax credits and deductions, payments for conservation projects, tradeable credits, low-interest loans, and free expert knowledge that educate the landowners on how they can maximize potential on their lands while conserving at the same time.[27] Incentives, therefore, give a sense of authority to landowners

[25] Parkhurst, G. M., & Shogren, J. F. (2003). Evaluating incentive mechanisms for conserving habitat. *Natural Resources Journal*, 1093-1149.
[26] Shelton, H. C. (2018). Conservation in Texas: Bridging the Gap Between Public Good and Private Lands Using Landowner Incentive Programs. *Vt. J. Envtl. L.*, *19*, 273.
[27] Ibid.

and makes them realize that they have an obligation to the human and natural community to protect the functions that their lands perform.

Several forms of incentive measures can be considered towards the conservation of natural resources such as wetlands. From an economic perspective, the incentives that have been considered for environmental conservation include subsidies and conservation easements. In many jurisdictions such as in the United States, governments offer subsidies to landowners in the form of financial assistance to encourage them to participate in conservation initiatives. Subsidies can encourage private landowners to maintain the integrity of their lands by reducing the negative environmental impact of their development activities. They achieve this by assisting the landowners to cater for the maintenance and restoration costs of their lands. The subsidies can be in the form of loans, tax allowances, cash payments, and grants. A classic example of the application of subsidy in environmental conservation is The Idaho Department of Fish and Game (IDFG) that administers a Habitat Improvement Program (HIP) to encourage private landowners to invest in waterfowl habitat restoration and increase the populations of wild species.[28] IDFG currently attributes the increase of wild birds, in part, to the private landowners' decreased dependence on water and them embracing new technologies such as sprinkling.[29] Under the program, interested landowners contact the local IDFG office after which a habitat biologist will evaluate the land and designs appropriate restoration projects that can benefit wild birds and upland

[28] Goldstein, E. (2003). " Introduction to Environmental Economics": By Nick Hanley, Jason F. Shogren and Ben White (Oxford University Press, 2001); and" Environmental Economics: Theory, Application and Policy", By Duane Chapman (Addison Wesley Longman, 2000). *European Journal of Political Economy*, *19*(2), 391-392.

[29] Murphy, C. 2014. Idaho's Wetland Program Plan: A plan for implementing the Idaho Wetland Conservation Strategy focused on Idaho Department of Fish and Game's wetland and riparian habitats. Prepared for U. S. Environmental Protection Agency, Region 10, Wetland Program Development Grant. Idaho Department of Fish and Game, Wildlife Bureau, Habitat Section, Boise, ID. 99 pp. plus appendix.

game.[30] IDFG does not impose stringent obligations on the landowners and instead encourages but does not mandate public access to the land and allows the participants to leave the program at any time as long as they return the cost-sharing funding.[31] The subsidy has since encouraged more landowners to participate in HIP thus promoting habitat restoration and an increase in the species of wild birds.

Conservation easements are an incentive program that uses financial measures to encourage landowner participation.[32] The use of conservation easements has become one of the most popular strategies used today in developed countries. Kenya through WCMA also provides for the application of conservation easements in the conservation of wildlife. For instance, section 65(4) offers guidelines to create conservation easements one of them being the sustainable conservation and management of wildlife. They offer a less expensive tool and therefore an efficient mechanism for encouraging conservation initiatives on private lands.[33] They also limit conflicts over property rights since they are voluntary and legally binding agreements between the government and a landowner. In these agreements, the landowner gives up some of their rights over the land to protect the environment in exchange for financial benefits.[34] For instance, in the US, conservation easements assume an important role in biodiversity conservation and therefore address the conservation and economic needs of people thus bridging the gap between nature conservation and

[30] Parkhurst, G. M., & Shogren, J. F. (2003). Evaluating incentive mechanisms for conserving habitat. *Natural Resources Journal*, 1093-1149.
[31] Ibid.
[32] Shelton, H. C. (2018). Conservation in Texas: Bridging the Gap Between Public Good and Private Lands Using Landowner Incentive Programs. *Vt. J. Envtl. L.*, *19*, 273.
[33] Yonavjak, L., and T. Gartner. 2011. "Gaining Ground: Increasing Conservation Easements in the US South." *World Resources Institute Issue Brief* 7: 1–9.
[34] TNC (The Nature Conservancy, USA). 2011. "Private Lands Conservation." http://www.nature.org/ about-us/private-lands-conservation/index.htm

private landowners.[35] Conservation easements can be in the form of purchased development rights (PDR) easements and donated easements.[36] Under PDR easements, the landowners can sell their conservation-incompatible uses for a specific period and for a cash payment that is compatible with the forgone opportunity. Donated easements are based on tax incentives in which the landowners value the preservation of land and would accept compensation that is less than the fair market value of their land. In the United States, the Internal Revenue Service (IRS) provides tax incentives to landowners who donate the development interests in their land for conservation purposes.[37]

Conservation contracts can also make it attractive for landowners to voluntarily apply conservation measures on their lands. They provide economic incentives for activities that restore or enhance the quality of land or those activities that limit the negative impacts on biodiversity.[38] Conservation contracts ensure that the government provides compensation that is commensurate with the foregone benefits for a landowner. They have been successful in countries such as the United States where the government targeted the preservation of species and habitats.[39] Closely related to conservation contracts is the Conservation Reserve Program (CRP) in which landowners volunteer their lands for a specified time in return for annual payments which cover both the foregone benefits and the costs of restoration.[40] CRP is currently applicable in the United States where the

[35] Stein, S.M., M.A. Carr, R.E. McRoberts, L.G. Mahal, and S.J. Comas. 2010. "Threats to At-risk Species in America's Private Forests: A Forest on the Edge report." General Technical Report NRS-73, US Department of Agriculture, Forest Service. Northern Research Station. USA.
[36] Parkhurst, G. M., & Shogren, J. F. (2003). Evaluating incentive mechanisms for conserving habitat. *Natural Resources Journal*, 1093-1149.
[3737] Ibid.
[38] Kamal, S., Grodzińska-Jurczak, M., & Brown, G. (2015). Conservation on private land: a review of global strategies with a proposed classification system. *Journal of Environmental Planning and Management*, *58*(4), 576-597. Retrieved from https://www.tandfonline.com/doi/pdf/10.1080/09640568.2013.875463
[39] Ibid.
[40] Clough, P. (2000). Encouraging private Biodiversity-Incentives for biodiversity conservation on private land.

main objective is to remove land from agricultural production towards grassland and forest cover restoration.[41]

Technical and expert guidance is another form of an incentive program that can assist landowners with knowledge in property management in an environmentally friendly manner.[42] For instance, in the United States, the Texas Parks, and Wildlife Department has a dedicated Private Lands and Habitat Program that provides free advice and guidance to landowners about conservation and strategies of developing habitats.[43] Upon a landowner's request, a wildlife biologist will carry out necessary assessments that take into considerations factors such as the landowner's objectives for their land, history of use, and a description of recommendations for habitat conservation and management of wildlife. The program ensures that the landowners are equipped with expert knowledge on how to manage their land for their benefit and the surrounding ecosystem. However, the technical guidance incentives place the burden on landowners to seek out guidance and effectively follow instructions.

Stern (2006) argues that unlike other efforts to change people's attitudes and behaviors towards conservation, incentives are more effective since they lead to behavior change. McDowell (1986) states that private landowners accrue various conservation liabilities and thus should be entitled to at least partial state compensation for their economic losses or expenses incurred while conserving sensitive ecosystems.[44] Ideally, when land is developed to its full agricultural potential, it sells for considerably more on the open market as compared to the same land had it been set aside for

[41] Hellerstein, D. M. (2017). The US Conservation Reserve Program: The evolution of an enrollment mechanism. *Land Use Policy*, *63*, 601-610.
[42] Shelton, H. C. (2018). Conservation in Texas: Bridging the Gap Between Public Good and Private Lands Using Landowner Incentive Programs. *Vt. J. Envtl. L.*, *19*, 273.
[43] Private Lands & Habitat Program, TEXAS PARKS & WILDLIFE, https://tpwd.texas.gov/landwater/land/private/description/
[44] McDowell, C. (1986). Legal strategies to optimise conservation of natural ecosystems by private landowners-Economic incentives. *Comparative and International Law Journal of Southern Africa*, *19*(3), 460-473.

conservation purposes.[45] This introduces the application of tax concession-related incentives and subsidy-related incentives as discussed above. Tax concession incentives can be applied by exempting from property rates lands that have been affected by restrictions imposed by directives issued for conservation. Such an incentive, McDowell argues, could go some way towards offsetting the lost opportunity cost. When the benefits of conserving the environment outweigh the costs, private landowners will be more willing to conserve, sustainably utilize and manage natural resources as stewards instead of degrading.[46]

Successful incentive programs need to have active landowner participation and strategies for actively involving them in developing management plans. The effectiveness of incentive-based programs depends on the clarity of conservation goals and these should be both ecologically sound and acceptable to private landowners.[47]

2.5: The Value of Nyando Wetland to Surrounding Communities

Wetlands are among the most productive environments in the world. Some people have described them as "biological supermarkets" because of their extensive food webs that sustain livelihoods and their richness in biodiversity.[48] Some have also described them as "kidneys of the landscape" due to their value in hydrological and chemical cycles.[49] In addition to this, they offer numerous ecosystem goods and services that are classified by Millennium Ecosystem Assessment (MEA)

[45] Ibid.
[46] Farmer, J. R., Ma, Z., Drescher, M., Knackmuhs, E. G., & Dickinson, S. L. (2017). Private landowners, voluntary conservation programs, and implementation of conservation friendly land management practices. *Conservation Letters*, *10*(1), 58-66.
[47] Kamal, S., Grodzińska-Jurczak, M., & Brown, G. (2015). Conservation on private land: a review of global strategies with a proposed classification system. *Journal of Environmental Planning and Management*, *58*(4), 576-597. https://www.tandfonline.com/doi/pdf/10.1080/09640568.2013.875463
[48] Mitsch, W. J. and J. G. Gosselink. 1993. Wetlands, second edition. Van Nostrand Reinhold, New York, NY, USA.
[49] Barbier, E. B., Acreman, M. and Knowler, D. (1997). Economic Valuation of Wetlands: A guide for policy makers and planners, Ramsar Convention Bureau, Gland, Switzerland

into provisioning, regulating, cultural, and supporting services all of which generate economic value to humans.[50]

Like many wetlands, the Nyando wetland performs numerous socioeconomic and ecological functions. It is endowed with numerous natural resources on which the riparian local communities largely depend. For example, the continued supply of freshwater from the Nyando River coupled with the fertile soils from the surrounding plains have enabled the establishment of an irrigation system for sugarcane, rice, and other horticultural crops.[51] The hydrological functions that are performed by the wetland are responsible for regulating the discharge of River Nyando. As a result, there is the sustenance of natural irrigation and drainage, improved buffering of excess discharge of the river, and regulation of channel flow which provides a medium for transportation for some people.

The wetland is also useful in flood control. As a natural phenomenon, flooding is vital for the maintenance of the ecological functions of wetlands. For example, floods offer a natural means for the transport of dissolved or suspended material and nutrients into the wetland. Nyando wetland also ensures that the destructive nature of floods in the area is reduced by absorbing the energy of currents and waves thus preventing the potential for catastrophic effects of flash floods storms and droughts. Floods in the Nyando plains have led to the loss of life and property, destruction of crops, and the disruption of important economic activities thus increasing the poverty levels in the region. According to JICA (2005), if the wetland continues to face the risk of loss and degradation, the

[50] Millennium Ecosystem Assessment, (2005). Ecosystems and Human Well-Being: Wetlands And Water Synthesis. World Resources Institute, Washington, DC

[51] Owuor, J. B., Raburu, P. O., & Kwena, F. (2012). Community based approach to the management of Nyando wetland, Lake Victoria Basin, Kenya.

people residing in the high flood risk areas within the Nyando basin will continue to experience the destructive nature of floods.[52]

An estimated 72% of the people around the wetland use fertile soils to grow crops.[53] Some of the crops that are grown here include millet, sorghum, maize, peas, beans, sweet potato, cassava, tomatoes, and onions. Maize is the most dominant crop with an estimated 77% of households growing it.[54] During periods of drought, the wetland becomes vital for food production although there is a growing concern that continues commercial exploitation may become unsustainable. It also offers a greater percentage of freshwater with the rest coming from boreholes within homesteads.

The wetland has an abundance of natural products and renewable products such as papyrus, reeds, grass, sedges, and clay for building and wood. Close to 80% of people in Nyando wetland live in traditional huts made from materials from the wetland such as clay, wood, and papyrus while an estimated 85% use wood as a source of energy.[55] Some of the materials are important energy sources such as fiber, fodder, and fuel. Livestock grazing is one of the most important activities with close to 78% of people grazing for subsistence. People also harvest medicinal products from the wetland for various ailments. This has also become a source of income for most people.

The wetland hosts a variety of fish and plant species and a high diversity of other forms of wildlife some of which are threatened or endemic. It also acts as breeding and nursery grounds for fish

[52] JICA (2005) Strategy for flood management for the Lake Victoria Basin. Prepared by Japan International Cooperation Agency.
[53] Obiero K. O., Philip O. Raburu., J. B. Okeyo-Owuor. and Elizabeth Raburu. (2012). Community Perceptions on the Impact of the Recession of Lake Victoria Waters on Nyando Wetland. *Scientific Research and Essays* Vol. 7(16), pp. 1647-1661
[54] Onyango, F.O. (2012): Valuation of Consumptive Wetland Resources in the Nyando Wetland. Thesis, Moi University, Kenya.
[55] Owuor, J. B., Raburu, P. O., & Kwena, F. (2012). Ibid

species hence ensuring the sustenance of lake fisheries and livelihoods. Overall, the economic value of the Nyando wetland is estimated at Ksh. 204.1 Billion shillings (US$ 2.1 Billion), an indication that there should be improved efforts towards its sustainable management.

More importantly, the wetland significantly contributes to carbon sequestration which refers to the process of capturing and storing atmospheric carbon dioxide, and thus they play an important role in the reduction of carbon dioxide from the atmosphere. This significantly reduces climate change pointing to the urgent need for concerted efforts to ensure that the wetland is sustainably managed. Research indicates that wetlands carry a disproportionate amount of soil carbon and the anoxic conditions that characterize these soils slow down decomposition leading to the accumulation of organic matter.[56] They can therefore accumulate large stores of carbon becoming important sinks for atmospheric carbon. According to a study on the restoration of productive wetlands for carbon sequestration, there is a growing global interest in wetlands for their ability to store carbon given the long residence time and the fact that wetlands can act as negative emission technologies that can help to mitigate climate change.[57] These studies affirm that wetlands are among the most critical ecosystems in response strategies towards climate change and thus efforts should be made to prevent their current decline.[58] Therefore, draining and degradation of the Nyando wetland can significantly reduce its ability to sequester carbon and thus exacerbate climate change. For instance, studies in the United States show that due to anthropogenic activities, more than half of the historical wetland area has been lost resulting in a significant transfer of carbon from the soil

[56] Nahlik, A. M., & Fennessy, M. S. (2016). Carbon storage in US wetlands. *Nature Communications*, *7*(1), 1-9.
[57] Valach, A. C., Kasak, K., Hemes, K. S., Anthony, T. L., Dronova, I., Taddeo, S., ... & Baldocchi, D. D. (2021). Productive wetlands restored for carbon sequestration quickly become net CO2 sinks with site-level factors driving uptake variability. *PloS one*, *16*(3), e0248398.
[58] Were, D., Kansiime, F., Fetahi, T., Cooper, A., & Jjuuko, C. (2019). Carbon sequestration by wetlands: a critical review of enhancement measures for climate change mitigation. *Earth systems and Environment*, *3*(2), 327-340.

into the atmosphere.[59] One of the key outcomes from the COP26 climate summit in Glasgow is that the world remains off-track in its efforts to beat the climate crisis.[60] COP26 focused on climate mitigation and adaptation and wetlands can be part of this solution if countries can enhance their sequestration ability. At the climate summit, wetlands featured prominently as a nature-based solution to climate change. According to the United Nations Environment Programme (UNEP), protecting and restoring wetlands can reduce global greenhouse gas emissions by 800 million metric tonnes yearly.[61] This evidence proves that the Nyando wetland is not only vital to the local community but also the world at large due to its contribution change. As a result, there is urgent to explore measures that can ensure its sustainable management.

2.6: Assessment of Kenya's Legal Framework on Wetlands

Kenya's framework for wetland management is regulated by several laws, regulations, and policy among them the Constitution which is the supreme law, Wildlife Conservation and Management Act, 2013 which is the principal law on wetlands in Kenya, Wildlife Management and Conservation (Protected Wetlands) Regulations, 2016, Environmental Management and Coordination Act, 1999 (EMCA), The Environmental Management and Coordination (Wetlands, River Banks, Lake Shores, and Sea Shore Management) Regulations, 2009 and National Wetlands Conservation and Management Policy, 2015. Other laws include The Land Act, No. 6 of 2012, Physical and Land Use Planning Act, No. 13 of 2019. Concerning Nyando Wetland, the Lake Basin Development Authority Act, No. 14 of 1991 is also relevant.

[59] Nahlik, A. M., & Fennessy, M. S. (2016). Ibid.
[60] Mountford, H., Waskow, D., Gonzalez, L., Gajjar, C., Cogswell, N., Holt, M., Fransen, T., Bergen, M., & Gerholdt, R. (2021, November 17). COP26: Key Outcomes From the UN Climate Talks in Glasgow. *World Resources Institute*. https://www.wri.org/insights/cop26-key-outcomes-un-climate-talks-glasgow
[61] United Nations Environment Program (UNEP). (2021, November 25). Peatlands in spotlight at COP26. https://www.unep.org/news-and-stories/story/peatlands-spotlight-cop26

The Constitution lists the concept of sustainable development as one of the principles of governance under Article 10(1)(d). This concept calls for the rational use of natural resources for the present and future generations. Under Article 40(1), the Constitution gives every person the right to acquire and own property, either individually or in association with others. It goes further to protect people from deprivation of their property under clause 3 and explicitly explains the conditions for which such deprivation may occur. Article 61(2) gives the classification of land as public, community, or private. Under this classification, the Constitution brings out the property rights regimes in Kenya from which the issues of natural resource management arise. Article 66 gives provisions for the regulation of land use and property. It states that the state may regulate the use of any land in the interest of defense, public safety, public order, public morality, public health, or land use planning thus empowering relevant agencies to exercise the doctrines of eminent domain and police power.

The Constitution is very clear under Article 10(1)(d) that it operates under the concept of sustainable development which is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Phillippe Sands (2003) states that two concepts arise from the definition of sustainable development.[62] The concept of needs, specifically the needs of the present generation, and the idea of limitations which is imposed by the state of social organization on the ability to meet present and future needs. The constitution thus offers a strong background for the need to conserve and enhance the country's resource base. It also provides backing for international laws that aim towards the conservation of biological diversity as enshrined in Article 2(5) and (6).[63] It is on this basis that the Ramsar

[62] Philippe, S. (2003). Principles of international environmental law. *Cambridge*: *Cambridge UP*.
[63] Art. 2(5), (6) The general rules of international law shall form part of the law of Kenya.
Sovereignty; Any treaty or convention ratified by Kenya shall form part of the law of Kenya under this Constitution.

Convention forms an important part of the legal framework for wetlands management in Kenya. More importantly, the Constitution through the principle of sustainable development affirms the need for collaborative efforts to explore strategies that can enhance environmental conservation. Although it does not expressly direct the use of incentives in natural resource management, the principle of sustainable development offers a strong foundation for the implementation of incentives so that the sustainable management of natural resources such as wetlands can be realized.

The Environmental Management and Coordination Act, 1999 (EMCA) is the framework law that governs the management and conservation of natural resources in Kenya. Section 42(1) provides for the protection and conservation of the environment and establishes the importance of an Environmental Impact Assessment (EIA) concerning a river, a lake, or a wetland. It further lists activities that should not be carried out in these areas including interfering with their natural nature in the form of draining them, excavating, or erecting structures. It also empowers the minister to declare a lakeshore, riverbank, or wetland as a protected area and this includes the imposition of restrictions that protect them from environmental degradation. Under this provision, the Minister may also issue orders, regulations, and standards for the management of wetlands. In addition, Section 57(1) of EMCA provides for the application of incentives and disincentives to realize the sustainable management of wetlands. EMCA, therefore, encourages the use of legal and fiscal incentives to encourage people to willingly take part in initiatives that conserve rather than degrade the environment. By entrenching the use of incentives in the conservation and management of the environment, EMCA recognizes that, unlike the command and control measures that have been emphasized, incentives revolve around behavior change and thus can be more effective in realizing sustainable management of wetlands.

Regulations 3 to 14 under Environmental Management and Coordination (Wetlands, River Banks, Lake Shores, and Sea Shore Management) Regulations, 2009 provide guidelines for the management of wetlands and wetland resources. For instance, Regulation 3 states that the provisions of Part II of the Regulations apply to all wetlands in Kenya whether occurring in private or public land thus according to protection to wetlands in all tenure regimes. Thus regulation bestows an obligation on private landowners to safeguard the integrity of wetlands even while pursuing their individual needs. Regulation 14 sub-regulation 1 stipulates the duty of landowners, users, and occupiers for wetland conservation and management. The regulation uses a language that considers wetlands as 'public goods' and thus outlines the need to utilize all wetlands sustainably and thus forms an important guideline for this thesis. Moreover, it shows that given the vitality of wetlands, there is a need to explore appropriate strategies alongside the law to ensure sustainable management of wetlands.

The Wildlife Conservation and Management Act, 2013 recognizes that Wetlands are an important part of wildlife since they provide habitats for rich flora and fauna which form part of biodiversity. It also outlines how conservation easements and incentives can be used to promote the sustainable utilization of natural resources (wildlife) thus revealing its appreciation of the value of incentives in wetland conservation. For instance, it encourages the creation of wildlife conservation easements by the voluntary private arrangement or upon the application to the Environment and Land Court (ELC) and further establishes the objectives of creating conservation orders and easements by insisting on the principles of sustainable conservation and management of wildlife. The Wildlife Conservation and Management (Protected Wetlands) Regulations, 2016 applies to all protected wetlands in the country thus offering maximum protection to them. For instance, Section 6(1) states that the regulations shall apply to all protected wetlands in Kenya irrespective

of where they are found (public, community, or private land). Although this is plausible, it does not capture the vitality of wetlands that do not have protection status and thus wetlands such as Nyando wetland remain vulnerable to unsustainable utilization. However, WCMA already provides a strong background for the consideration and implementation of incentives such as conservation easements alongside other relevant incentives to secure the sustainable management of wetlands in Kenya. For instance, Section 52 of the Act allows for the creation of wildlife conservation easements through voluntary private arrangements to further the principles of sustainable wildlife conservation and management. In addition, Section 63 provides guidelines for the use of incentives stating that they should be subjected to public scrutiny upon their formulation. As a result, discussions around the use of incentives can start from here, and given their legal backing, they can result in positive improvements in wetland conservation.

The Land Act, No. 6 of 2012 emphasizes the security of land rights and considers the conservation and protection of ecologically sensitive areas. It establishes under section 9 the process of converting private land to public land through compulsory acquisition (eminent domain) thus opening up opportunities to advance environmental initiatives on private lands. It also empowers the NLC under section 11 to take relevant action to protect public land that has endangered or endemic species, critical habitats, or protected areas. Although it does not expressly list incentives as an alternative to existing regulatory tools, it empowers NLC to take appropriate action which may include a consideration of incentives to ensure that sensitive ecosystems are sustainably utilized, and managed. However, the Land Act mostly tends to veer towards the use of command and control measures such as eminent domain as opposed to the use of incentives.

The Physical and Land Use Planning Act, 2019 No. 13 of 2019 seeks to incorporate environmental concerns into all physical development plans by stating that all developmental activities should be

planned in a manner that integrates social, economic, and environmental needs of the present and future generations. It also brings out the concept of preservation of land-based resources depending on their scarcity and sensitivity. It uses a language that points to the application of the doctrine of police power to facilitate environmental conservation and thus shies away from expressly advocating for incentives. The Act emphasizes land use planning as the approach that can fully integrate environmental concerns in development programs. For instance, Section 22(2) establishes that physical and land use planning is the basis for ensuring environmental protection, conservation, and improvement while pursuing development programs.

The National Wetlands Conservation and Management Policy, 2015 sets out policy statements that guide wetland conservation and management in Kenya. It also recognizes that there are huge challenges in wetland management under the diverse land tenure system. For instance, it recognizes that wetlands that lack protection status are degraded as compared to those that have state protection. This exposes the need to formulate effective strategies that can protect all wetlands in Kenya especially under the tenure system. On this, it provides three policy statements one of which seeks to regulate, protect, manage and conserve all wetlands including those within the public, private, and community land. Its appreciation of the role of the private land tenure system in wetland conservation reveals that apart from the law, there is a need for other strategies that can ensure that landowners do not pursue their interests at the expense of the environment. Although the Policy does not expressly advocate for the use of incentives in the sustainable management of wetlands in Kenya, it uses a language that favors the exploration of incentive-based mechanisms to secure the protection of the environment.

The Lake Basin Development Authority Act, No. 14 of 1991 provides for the establishment of an Authority (Lake Victoria Development Authority, LVDA) to plan and coordinate the

implementation of development projects in the Lake Victoria catchment area. The authority is further tasked with coordinating the abstraction and use of natural resources especially water and setting up effective monitoring for their usage and ensuring that landowners undertake all measures specified by the Authority to protect the water and soils of that area. Like the Physical planning and land use Act, it tends to emphasize land use planning as the solution to environment-related issues, wetlands conservation being one of the issues.

2.7: Gaps in Literature

The existing literature shows that Kenya has several laws and policy that are relevant to wetland management. The Constitution which is the supreme law also offers guidance alongside other laws on how the private land tenure system can be regulated to engender conservation imperatives. However, there is overwhelming evidence that the legislated tools for regulation have not offered a complete solution to wetlands management on privately owned lands. In many cases, they have enhanced people's unwillingness to participate in conservation initiatives. The ineffectiveness of these regulatory tools has also contributed to increased wetland degradation and loss as in the case of Nyando Wetland. Research points to the need for the adoption of other incentives in the country's quest towards sustainable management of wetlands. Based on the literature review, the recognition and understanding of the limitations of eminent domain and police power are indications that there are is improper management and conservation of wetlands on private lands and that Kenya should consider other incentives to address the current management and conservation challenges. Most researchers address the implications of wetland conservation in Kenya by reviewing the legal and policy framework. Researchers are also concerned with the land tenure system as a whole and its implications on wetland management in Kenya. The literature reviewed indicated that there was limited research on how private landowners can be incentivized

to ensure the sustainable management of wetlands. Most researchers focus on regulating property rights through eminent domain and police power to ensure the sustainable management of wetlands in Kenya. This study seeks to address this gap by moving away from the command and control regulation towards cooperative regulation through the use of incentives. It achieves this by explaining the failure of the command and control regulation to offer a complete solution in the sustainable management of wetlands. It further identifies and analyzes the incentives that can be used to encourage private landowners to sustainably manage wetlands.

CHAPTER THREE

RESEARCH METHODOLOGY AND DESIGN

3.1: Description of Study Area

The study was conducted within the jurisdiction of Kisumu County, specifically in Kakola-Ombaka which is located in the Nyando sub-county. Kakola-Ombaka is one of the administrative units in Nyando that consist of eleven villages namely, Kasiwindi North and South, Kasambura/Kamahawa, Kanyipola North and South, Kaloo North and South, Kabonyo southeast and Kabonyo south west, Tura, Wang'aya, Kamwanda and Kabonyo North with an approximate population of 400 people each according to the 2019 National Population census. The villages border Nyando wetland with some extending into the wetland.

The area is generally hot, with a mean annual temperature of 23° C and occurs at latitude 0.25 South, longitude 34.88 East, and an altitude of 1142.00m/3746.72ft.[1] The area is low-lying and receives rainfall of about 1,000–1,600 mm per annum and the people living here are generally farmers. Kakola-Ombaka is prone to droughts and flooding which have contributed to the low economic status of the people.[2] The area experiences flooding annually due to heavy rainfall in the surrounding highlands making it a high-risk area.[3] The perennial flooding and droughts expose the communities in Kakola-Ombaka to food insecurity and diseases that have cumulatively affected the productive capacity of the area.[4] However, the people of Kakola-Ombaka are willing to live

[1] Owuor, J.B., Raburu, P.O. and Kwena, F., 2012. Community based approach to the management of Nyando wetland, Lake Victoria Basin, Kenya.
[2] Ombati, S. N. (2017). *Community Participation in Flood Mitigation Strategies, Networking and Collaboration, Cultural Factors and Household Livelihood in Nyando Flood Plains, Kisumu County, Kenya* (Doctoral dissertation, University of Nairobi).
[3] Asking, V., & Nilsson, J. (2019). Risk acceptance in flood affected areas in Nyando, Kenya.
[4] Nyakoyo, O. G., & Odhiambo, A. I. (2020). Stakeholder Information Sharing and Implementation of Sustainable Community Food Security Projects in Nyando Basin, Kenya.

through the floods and drought due to culture and traditions. Nyando Wetland which is the focus of the study covers a considerable portion of Kakola Ombaka. The figure below shows the location on Nyando Wetland.[5]

Figure 2: Satellite Map of Kakola-Ombaka. (Source: Google Map)

3.2: Research Design

This was a qualitative study that adopted a descriptive research design which involved an in-depth and accurate description and analysis of the problem under study. This is a type of design that aims

[5] van Dam, A. A., Kipkemboi, J., Rahman, M. M., & Gettel, G. M. (2013). Linking hydrology, ecosystem function, and livelihood outcomes in African papyrus wetlands using a Bayesian Network model. *Wetlands*, *33*(3), 381-397.

to collect information and use it to systematically describe a population, situation, or phenomenon. The design was aimed at making careful and detailed documentation of the problem by focusing on the "what, how, when, and why" of the research subject.[6] Under this research design, the research would carefully focus on discovering the nature of specific events so that there would be a straightforward descriptive summary of the generated data. The main purpose of applying the research design was to be able to comprehensively summarize and effectively analyze specific events in the study. The study was generally trying to understand how private landowners can be incentivized to ensure the sustainable management of wetlands in Kenya but first needed to explain the factors that have led to the failure of eminent domain and police power as regulatory instruments for the private land tenure system. The descriptive study design would enable an explanation of the "how" and "what." The research design, therefore, fit the purpose of the study and enabled the researcher to answer the research questions.

3.3: Data Needs, Types, and Sources

Objectives	Data Needs	Data Types	Data Sources
Objective 1	• Data on the current laws and policy on wetlands • Challenges and opportunities under the current legal regime	Qualitative data	Secondary sources- legal and policy documents
Objective 2	• Participants' perceptions towards the doctrines of	Qualitative data	Primary data - Focus group discussions and

[6] Sahin, S., & Mete, J. (2021). A Brief Study on Descriptive Research: Its Nature and Application in Social Science. *International Journal of Research and Analysis in Humanities*, *1*(1), 11-11.

	eminent domain and police power as regulatory tools for private property rights.		Key informant Interviews
Objective 3	• Participants' identification of the applicable incentives.	Qualitative data	Primary sources - Focus group discussions and Key informant Interviews
Objective 4	• Data on the experiences and lessons from other countries on the use of incentives to ensure the sustainable management of wetlands.	Qualitative data	Secondary sources

Table 1: Data Needs, Data Types, and Data Sources

Qualitative data from primary and secondary data sources were needed to answer the main research question. Since the research was descriptive and involved the collection of perceptual information, qualitative data was preferred because it would help in understanding these perceptions while also discovering new thoughts and views on the research problem. Primary data sources included key informant interviews and focus group discussions while secondary data sources included legal and policy documents, books, and journal articles. A combination of these sources enabled the research to address the four specific objectives of the study.

3.4: Sampling Procedure and Data Collection

The study adopted purposive sampling, a nonprobability sampling that relies on expert judgment. The sampling procedure enabled the researcher to produce a sample that could be logically assumed to be representative of the population. The research relied on 6 Focus Group Discussions (FGDs) consisting of 8 people each to generate information. Using the help of the local chief and assistant chief, the researcher selected people from the 11 villages and generated two groups for men, two groups for women, and two groups for the youth. A total of 48 people took part in the focus group discussions. The research also used purposive sampling and selected 8 key informants from the local administration, department of the environment including environment officers stationed in Nyando, and environmental interest groups such as VIRED in Kisumu County.

The researcher collected both primary and secondary data for the study. Based on the data needs illustrated in Table 1, primary data collection was carried out through focus group discussions and key informant interviews. The main purpose of using focus group discussions was to enable the researcher to have free and open discussions with respondents and also to generate useful and in-depth insights and ideas on the research questions.[7] The research used key informant interviews with semi-structured questions to capture rich data and expert information on the research questions. The researcher, therefore, collected data from knowledgeable individuals who significantly contributed their perspectives and information on the research questions.[8]

[7] O. Nyumba, T., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and evolution*, *9*(1), 20-32. Retrieved from https://besjournals.onlinelibrary.wiley.com/doi/10.1111/2041-210X.12860

[8] Cossham, A., & Johanson, G. (2019). The benefits and limitations of using key informants in library and information studies research. *Information Research*, *24*(3), 15. Retrieved from http://informationr.net/ir/24-3/rails/rails1805.html

Secondary data was collected through a review of the literature. The literature review was the first activity that enabled the successful identification of secondary sources of data such as legal and policy documents that would be relevant for the study. Also, through a review of literature, the research appreciated the already existing research and was able to decipher the current research problem through gaps in existing research. Information from the literature review, therefore, become a fundamental source of secondary data which was later analyzed and synthesized alongside primary data from the field. Through desktop research, the researcher organized a literature review along with key themes covering limitations of eminent domain and police power, Incentives for wetland conservation, and the legal framework on wetlands.

Overall, the collection of data followed four main steps namely; preparation of research instruments, testing of research instruments, pre-visit to the study area, and field data collection.

3.5: Field Data Collection

The field data collection required one main area of information; perceptual information which relates to the participants' perceptions on specific areas of inquiry. It, therefore, sought to gain perceptual information from the participants using key informant interviews and focus group discussions.

3.5.1: Key Informant Interviews

To obtain detailed information from key informants, the interviews involved the use of questionnaires which generated open-ended discussions. The researcher also relied on nonverbal cues to gain additional insights into the participants' responses. The researcher used an interview guide to generate discussions around the research questions with key people such as community leaders, county government officials, environment officers, and researchers. Discussions with

some of the key informants provided an opportunity for snowball sampling, a recruitment technique in which research participants identify other potential subjects for research.[9] The interviews aimed to gain the opinions, experience, and knowledge of the key informants on the research questions.

3.5.2: Focus Group Discussions

Focus group discussions (FGDs) refer to researcher-directed discussions with a group of people within a researcher's study area. The researcher uses a predetermined checklist of key questions around the study's questions and objectives to guide the discussions. Through FGDs, a researcher can gain an in-depth understanding of the perceptions, motivations, beliefs, and attitudes of the participants on the research topic. The researcher conducted six focus group discussions consisting of eight people with a representation of age and gender. The six FGDs were conducted at a Red Cross Camp where a majority of the people were displaced, the assistant chief helped in inviting others from the eleven villages to come to the camp. The FGDs consisted of local businessmen and women, teachers, village elders, and students. During the FGDs, the researcher captured the information through note-taking.

3.6: Data Analysis

Data analysis which is a systematic process of applying both statistical and logical techniques to illustrate, describe, condense and evaluate collected data was carried out based on qualitative analysis techniques. The qualitative data which was collected through FGDs and key informant interviews were subjected to content analysis which according to Erlingsson and Brysiewics

[9] Kirchherr, J., & Charles, K. (2018). Enhancing the sample diversity of snowball samples: Recommendations from a research project on anti-dam movements in Southeast Asia. *PloS one*, *13*(8), e0201710. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6104950/

(2017)[10] transforms a large volume of text into a highly organized and concise summary of key findings. To realize this, the researcher read the responses from both KII and FGDs and gained a general understanding of what the participants talked about. The data was then coded by assigning labels such as words and phrases to texts. Coding as described by Linneberg and Korsgaard (2019) is an important tool that turns raw qualitative data into a communicative and trustworthy story.[11] It involves examining a coherent portion of empirical material and labeling it with a short phrase or a word that summarizes its content. Through this, the researcher was able to synthesize the data and create concepts, ideas, and themes.[12]

3.7: Ethical Considerations

Before starting the field study, the researcher obtained an introductory letter from the school department indicating that the study was for a research purpose. The introductory letter also enabled the researcher to obtain a research permit from National Commission for Science, Technology, and Innovation (NACOSTI) as will be evidenced in the appendix.

There is also a need to consider all the ethical considerations that relate to that particular research. It is important to protect human subjects through the application of appropriate ethical principles and consideration in all research studies.[13] In qualitative studies such as this, ethical considerations have a specific resonance due to the in-depth nature of the research process. Ethical considerations, therefore, guide how to carry out research. This research considered informed consent, voluntary

[10] Erlingsson, C., & Brysiewicz, P. (2017). A hands-on guide to doing content analysis. *African Journal of Emergency Medicine*, *7*(3), 93-99.
[11] Linneberg, M. S., & Korsgaard, S. (2019). Coding qualitative data: A synthesis guiding the novice. *Qualitative research journal*, Vol. 19 No. 3, pp. 259-270. Retrieved from https://doi.org/10.1108/QRJ-12-2018-0012
[12] Vaismoradi, M., & Snelgrove, S. (2019, September). Theme in qualitative content analysis and thematic analysis. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* (Vol. 20, No. 3).
[13] Arifin, S. R. M. (2018). Ethical considerations in qualitative study. *International Journal of Care Scholars*, *1*(2), 30-33.

participation, confidentiality, and in light of COVID-19, social distancing measures. Informed consent is a principle that requires that the researcher explains the objectives of the research so that people can decide whether to participate or not. It is related to the ethical principle of voluntary participation which establishes that participants should not be coerced into participating in research in any way. Ethical principles of research also require that participants should not be exposed to either physical or psychological harm and thus the study adhered to the principle of confidentiality. The participants were therefore assured that their names would be excluded from the research. The researcher also bore in mind that the health and wellbeing of the participants take priority over the timelines of the research.[14] Therefore, the researcher ensured that the participants adhered to the Ministry of Health guidelines by maintaining social distancing during the study.

3.8: Limitations of the Study

There were three main limitations of the study; inaccessibility of key informants, communication barrier, and health of the researcher and participants due to COVID -19. The research primarily relied on FGDs and KIIs. Although the participants for FGDs were easy to access since most of them were displaced by floods and placed in a camp, KIIs were difficult to access due to their work schedules. Also, KII were distributed in various locations and thus the researcher had to travel long distances to access them. For this reason, the researcher relied on referrals from specific KIIs to obtain other KIIs. Since some of the concepts of the research are technical, translating and explaining them in the local language was a problem hence the problem of communication barrier. The research was conducted at a time when there was a surge in COVID-19 numbers in Kisumu County and the national and county governments had put in place measures to curb the disease

[14] Jowett, A. (2020). Carrying out qualitative research under lockdown-practical and ethical considerations. *Impact of Social Sciences Blog*.

such as restriction of movement and social distancing. It was therefore a health risk for both the researcher and the participants to carry out the research.

The researcher overcame the limitation of inaccessibility of key informants mapping out the key informants in specific locations and setting out specific days to interview them. Also, the researcher made appointments before meeting the key informants thus reducing costs of travel. The problem of the communication barrier was overcome through the help of the area assistant chief who explained some of the concepts in the local language. The researcher overcame the health limitation due to COVID-19 by adhering to the ministry of health protocols that were aimed and curbing the virus. The researcher also undertook a COVID-19 test before and after the research exercise.

Despite these limitations, the study will still inform a strong foundation for arguments on incentivizing private landowners for the sustainable management of the wetland in Kenya.

CHAPTER FOUR

RESEARCH FINDINGS, ANALYSIS, AND DISCUSSION

4.1: Overview

This section presents the findings of the study based on both primary and secondary data collected. The findings from primary and secondary data inform the main findings of the study on incentivizing private landowners for the sustainable management of wetlands in Kenya. The section offers succinct analysis and discussion of the collected data.

4.2: Land Ownership and its Influence on the Use of Nyando Wetland

Kakola-Ombaka which harbors a section of Nyando wetland is a rural area where the land tenurial system is largely communal. As a result, people inherit family land and pass it on to their children and grandchildren. However, due to the sensitivity of land, there has been an increased interest among the local people to obtain titles for their land as evidence of ownership. There has also been an increased interest among family members to convert their community land to private land.

A majority of the respondents in the FGDs confirmed that the land in Kakola-Ombaka is mainly communal and thus the community title is superior to individual entitlements to land. Being a Luo community, the basic right to own land stems from being a member of the clan and thus every member has an inalienable right to land that they have acquired from their fathers and grandfathers.[15] Only the male respondents who took part in the FGDs reported owning land either privately or part of the community. The married female respondents reported owning land through

[15] Hebinck, P. G. M., & Mango, N. (2001). Kinship relations and land inheritance among the Luo. In *Kinship structures and enterprising actors. Anthropological essays on development* (pp. 37-57). Wageningen University. Retrieved from https://www.researchgate.net/publication/40159110_Kinship_relations_and_land_inheritance_among_the_Luo

their husbands thus reinforcing the idea that land rights tend to be held by men or kinship groups that are also controlled by men while women have access to the land through their husbands.[16]

Public land in the area constituted land on which schools, hospitals, and government agencies are situated. Despite all these, the discussions with the participants indicated that the private land tenure system around the wetland significantly influences how people use the wetland goods and services.

Landowners around Nyando wetland reported using the wetland for several functions. The households within and around the wetland derive several direct and indirect uses for their livelihoods. The FGDs identified that maize was the most common crop grown within and around the wetland. The discussions showed that rice, sugarcane, and watermelons are also grown within and around the wetland. The participants also reported that they grow trees for construction and vegetables such as kales, tomatoes, and onions. Other activities that take place within and around the wetland include fishing, obtaining water, and fodder for livestock. The participants also reported using the water from the wetland for domestic purposes such as washing and bathing. These findings are consistent with other research findings on the Nyando wetland that show that it provides many benefits to the livelihoods of the surrounding communities.[17] They also confirm that the extensive economic activities such as farming in and around the wetland have significantly contributed to the degradation of the wetland.[18]

[16] Shaffer, M. (2019). Empowering Women Through Land: An Analysis of the Barriers in Accessing Land Rights within Kisumu County, Kenya.
[17] Oduor, F. O., Raburu, P. O., & Mwakubo, S. (2015). To conserve or convert wetlands: Evidence from Nyando wetlands, Kenya. *Journal of development and agricultural economics*, *7*(2), 48-54.
[18] Wayumba, M., & Saina, C. (2018). The Use of Fishing Gears and Role of Beach Management Units in the Nyando Wetland. *Africa Environmental Review Journal*, *2*(2), 167-176.

The participants in the FGDs reported that they use the wetland for growing crops such as rice and sugarcane because those crops need a lot of water and hence the wetland eases the work. For instance, when they grow sugarcane and rice in the wetland, they have easy access to water and thus they can sufficiently irrigate them. They added that despite having River Nyando and Lake Victoria, they face difficulties accessing water for crops and irrigation. This is mainly attributed to an ineffective water allocation system and a lack of adequate conditions to implement sustainable integrated water resources management (IWRM) strategies in the area.[19] The participants indicated that they heavily depend on agriculture for subsistence and sustaining their livelihoods and thus rely on the wetland for its goods and services. They also reported that due to high incidences of poverty and lack of employment, most of them are forced to unsustainably use wetland goods and services such as fish for food. For instance, during periods of drought, the participants reported that they are forced to harvest any available resource from the wetland. They also reported that when the environment is stable (absence of drought and floods), they cultivate within the wetland sometimes exceeding the allowable limits to maximize their returns. According to one of the participants,

> *"… as the people of Kakola-Ombaka, we experience extremes of drought and floods which sometimes last a long time. Most of us have limited education and so we cannot go for formal employment, we rely on the wetland for agriculture and food for our children. I cannot see fish and let it swim away while my children suffer hunger…"*

[19] Sungu, R. O. (2018). An assessment of the influence of water allocation on sustainable water resources management: A case study of the Nyando river basin, Kenya.

The residents of Kakola-Ombaka are mostly aware of the value that they can get from the wetland in terms of goods and services as noted by a majority of the respondents. They are also aware of legislation that permits or prohibits the use of wetland goods and services. However, they are constrained by the high incidence of poverty which significantly influences the way they use the wetland. For instance, the FGDs participants mentioned the role of the Fisheries Management and Development Act, 2016 (No. 35 of 2016) in regulating their fishing activities. They mentioned that the law forbids their fishing activities during certain periods and requires them to have the right fishing gear. Sections 40(1) of the Act provides measures for fisheries management including prohibited fishing gears and closed fishing seasons and subsection 2 states that anyone who contravenes the provisions is liable on conviction. However, due to high incidences of poverty and the need to meet their livelihood demands, they tend to undermine these provisions. The participants confessed that despite the efforts put in place through legislation to curb the unsustainable utilization of wetland goods and services, they still contravene the provisions so that they can provide for their families.

Crops Grown within and around Nyando wetland	Activities carried out within and around the wetland
1. Maize	1. Fishing
2. Rice	2. Livestock Grazing
3. Sugarcane	3. Irrigation
4. Watermelons	4. Planting trees for construction
5. Vegetables- Kales, Onions, tomatoes	

Table 2: Crops Grown Within and Around Nyando Wetland

4.3: Impact of Private Land Tenure on the Conservation of Nyando Wetland

The research found that the private land tenure system has a significant impact on the conservation of Nyando wetland thus agreeing with various scholars on the implications of private property rights on wetland management.[20] The respondents with private lands from the FGDs reported that they carry out the cultivation of crops sometimes into the wetland. Intensive cultivation which sometimes involves the use of fertilizers significantly interferes with the quality of water further leading to the death of plants and animals within the wetland. The use of pesticides and fertilizers also leads to increased levels of nutrients and pollutant loads in wetlands thus resulting in algal bloom that causes the death of plants and animals.[21]

Due to poverty incidences, they also engage in overfishing which has led to a depletion of fish. The poor in the area tend to be highly dependent on the food resources such as fish that the wetland provides and thus they have no option but to consume the wetland resources for survival, in most cases unsustainably. According to one of the key informants, the residents of Kakola-Ombaka sometimes cultivate beyond the riparian areas and buffer zones. The key informant who is also an expert in issues of environment noted that buffer and riparian zones play an important role in controlling nonpoint source pollution and the associated water quality of nearby water bodies. By cultivating on riparian and buffer zones, private landowners around Nyando wetland not only interfere with the quality of water but also allow pollutants to penetrate and compromise the wetland's biodiversity. Another key informant reported that the private tenure system has led to overharvesting of papyrus reeds as well as overfishing which has significantly led to the depletion

[20] Kamal, S., Grodzińska-Jurczak, M., & Brown, G. (2015). Conservation on private land: a review of global strategies with a proposed classification system. *Journal of Environmental Planning and Management*, *58*(4), 576-597. Retrieved from https://www.tandfonline.com/doi/pdf/10.1080/09640568.2013.875463

[21] Department of Agriculture, Water and the Environment. (2016). Wetlands and Agriculture. Australian Government. Retrieved from https://www.environment.gov.au/water/wetlands/publications/factsheet-wetlands-agriculture

of important fish species such as *Clarias sp*. An environment Officer based in Nyando noted that some private landowners have encroached into the wetland thus catalyzing its degradation.

A field operation officer at Victoria Institute for Research on Environment and Development (VIRED) mentioned that private landowners in Kakola-Ombaka feel that they have the right to use their land and are unwilling to conserve it since it will interfere with their 'profitable' activities. This unwillingness has led to intensive cultivation around the wetland leaving the soil weak and susceptible to soil erosion. As a result, the soil washes into the river causing a mountain of silt that is a major contributor to flooding in the area as noted by a key informant from the National Water Harvesting and Storage Authority (NWHSA). The informant from NWHSA noted that the siltation on River Nyando covers over 6km and is compounded by cultivation along the river banks. These sentiments reinforce the idea that traditional regulatory policies for private lands have had limited effects especially since private landowners want to maintain their right to use their lands as they please.[22] They show the need to employ extensive actions such as incentives to engender voluntary behaviors in the pursuit of environmental conservation goals.[23]

4.4: Challenges to the Sustainable Use of Nyando Wetland

The main challenges to the sustainable use of Nyando wetland that the respondents identified include floods and drought, siltation, poverty, and laxity in law enforcement thus agreeing with previous research on the threats to the Nyando wetland.[24] The respondents noted that the challenges are related such that one leads to the other. A majority of the participants noted that

[22] Drescher, M., Warriner, G. K., Farmer, J. R., & Larson, B. M. (2017). Private landowners and environmental conservation: a case study of socialpsychological determinants of conservation program participation in Ontario. *Ecology and Society*, *22*(1).
[23] Ibid.
[24] Masese, F. O., Raburu, P. O., & Kwena, F. (2012). Threats to the Nyando wetland: Community based approach to the management of Nyando wetland, Lake Victoria Basin, Kenya. *Nairobi: Mcpowl Media Ltd*.

floods and drought posed the main challenge to the sustainable use of Nyando wetland. Floods and droughts cause heavy economic losses that affect agricultural households force people to exploit wetland goods for survival.[25]

The rest pointed out siltation, poverty, and laxity in law `enforcement. poverty is a major problem that is intricately linked to the degradation of the wetland. The poverty/wetland degradation nexus was evidenced in Nyando due to the increased conversion of the wetland to create room for the cultivation of subsistence crops. It was further evidenced by the overharvesting of wetland goods and services to sustain human survival. For instance, during drought, the residents of Kakola-Ombaka are forced to encroach on the wetland in search of food and fodder for their animals. They overharvest the fish for food and papyrus reeds for making baskets and mats for selling. During flooding, the residents lose their property such as crops, livestock, and homes, leaving them poor and unable to fend for themselves. When the environment stabilizes, the residents are forced to cultivate the land in an attempt to earn a living and survive. They do this intensively to the detriment of the wetland and the biodiversity within and around it

A summary of Challenges to the sustainable Use of Nyando wetland
1. Floods and drought
2. Siltation
3. Laxity in law enforcement
4. Poverty- Leads to problems such as overharvesting of wetland goods, encroachment, intensive cultivation

Table 3: Challenges to Sustainable Use of Nyando Wetland

[25] Rutto, V. K. (2019). *Analysis of shocks and coping mechanisms in climate smart villages of Nyando, Kenya* (Doctoral dissertation, University of Nairobi).

From the foregoing, poverty is a serious problem that the people of Kakola-Ombaka grapple with. The research was carried out at a time when the people had been displaced from their homes because of floods. As a result, they were unable to fend for most of their basic needs. One of the participants in the FGDs stated,

> *"… I cannot fend for my children now, if not for Red Cross, I cannot even afford food. When I go to the wetland during periods when fishing is prohibited and I find fish, I will fish even small ones because I have no choice…"*

Poverty results in other challenges among them encroachment into the wetland which exacerbates the problem of unsustainable use of wetland goods and services. The assistant chief of Kakola-Ombaka added that the law requires fishermen to use certain fishing gears/nets. However, most people due to a lack of alternatives use the wrong fishing nets to obtain fish from the wetland thus giving the fish little time to breed. The respondents in the FGDs as well as various key informants noted that laxity in law enforcement also posed a challenge to the sustainable use of Nyando wetland. They noted that there were more than enough laws to oversee the sustainable use of the wetland. The informant added that in the whole of Nyando sub-county which Kakola-Ombaka is part of, there is only one environment officer which makes enforcement of laws almost impossible. In many instances, the chief and assistant chief of the area are forced to act as environment officers. Another significant challenge that the respondents and informants noted was upstream pollution and unsustainable agricultural activities such as sugarcane irrigation that have contributed to siltation and degradation of the wetland.

4.5: How Private Land Owners can ensure sustainable Management of Nyando wetland

According to an informant from the NWHSA, the people of Nyando are doing everything in their power to reduce the degradation of the wetland because they understand the value of goods and services that they can get from it. For instance, the informant indicated that the residents are currently involved in tree planting initiatives alongside government initiatives to control flooding. Despite these steps, there are other initiatives that private landowners can engage in on their own to ensure that the wetland is sustainably managed. These initiatives will stem from their understanding of the value of the goods and services that they can obtain from the wetland.[26]

Tree planting was listed as one of the main activities that private landowners can do to ensure the sustainable management of the wetland. A majority of FGD participants and the key informants stated that tree planting would ensure that the soil remains firm and instances of soil erosion that contribute to siltation are reduced. Secondly, the respondents also noted that private landowners can limit the cultivation of crops on the wetland and overgrazing by maintaining the stipulated distance from the riparian and buffer zones and giving the wetland time to regain its ecological integrity. The environment officer noted that the private landowners can also engage in conservation agriculture/sustainable farming around the wetland to ensure that it is sustainably managed. Conservation agriculture ensures that farmers get high crop yields while maintaining soil fertility and conserving water. It operates on three basic principles namely little disturbance to the soil, keeping soil covered, and practicing mixed and crop rotation.

[26] Mushet, D. M., & Calhoun, A. J. (2020). Wetland conservation in the United States: A swinging pendulum. *Soil and Water Conservation: A Celebration of*, *75*.

4.6: Perceptions on Doctrines of Eminent Domain and Police Power and their Effectiveness

The participants in the FGDs were more concerned with title to land given the sensitivity of land issues today. As a result, a majority were against the doctrine of eminent domain since it would extinguish their title to land. They also noted that the compensation that they may obtain from the process may not be commensurate with the value of their land. Only a few of the participants preferred eminent domain because it would enable their relocation into more productive areas where they would not experience flooding.

On police power, the majority of the participants in the FGDs were against it since it would curtail the full enjoyment of their property rights. They noted that they prefer to fully enjoy their private land rights in ways that would profit them instead of engaging in activities that would not guarantee their livelihood such as conservation. One of the participants in the FGDs stated as follows,

> *"…what is the point of having land if I cannot enjoy it to the fullest. I need to cultivate it so that my children can eat. Police power will dictate how I use my land and it will not benefit me…"*

One key informant noted that eminent domain and police power may be partially effective since they are concerned with the interest of the public. However, the informant noted that the laxity of law enforcement may impede the success of eminent domain and police power. Another key informant noted that so far, there has been weak enforcement of both police power and eminent domain in environmental matters and thus they may not be viable solutions towards ensuring the sustainable use and management of Nyando wetland. Another key informant noted that although eminent domain can work since it offers compensation for the foregone rights to land, police power may elicit rebellion from landowners who will feel that their rights are curtailed. One of the informants from the department of environment, Kisumu county pointed out that there is limited

understanding of the eminent domain and police power among landowners at the local level and thus their enforcement in wetland management and conservation may not be successful.

4.7: Measures to Incentivize Landowners and Legal Provisions to Implement them

Since a majority of the residents of Kakola-Ombaka are farmers and the main challenges/factors influencing their unsustainable utilization of Nyando wetland to include flooding/drought and poverty, the respondents recommended the use of incentives that will not only promote the sustainable management of the wetland but also guarantee their livelihoods and that of their children. The respondents also noted that as compared to eminent domain and police power, incentives could benefit both the local people and the wetland. A majority of them argued that with appropriate incentives, they could compromise and limit their unsustainable use of the wetland. Only a few felt that incentives may still limit the full enjoyment of their land rights.

Some of the participants in the FGDs noted that to encourage the local people especially private landowners to conserve and sustainably use the wetland goods and resources, the government through its agencies can support their farming initiatives so that they can get the most out of it while using the wetland sustainably. One of the participants noted

> *"…we heavily rely on agriculture for subsistence and sale. To get maximum results, most of us use fertilizers that may not be friendly to the wetland. The government can come up with an initiative that supports local farmers through research on and provision of environment-friendly fertilizers that will ensure we get enough to produce and at the same time conserve the wetland. Such an initiative will encourage many people to work with the government in conserving the wetland."*

Another FGD participant added,

> *"…the government can give us loans to improve our businesses so that we are not forced to go into the wetland and unsustainably harvest the goods and resources there. Most of us contribute to the wetland's degradation because we have no other alternative. Loans will act as alternatives and they will encourage us to collaborate with the government in conserving the wetland because, at the end of the day, we have hope that we will get something from conserving it."*

In agreeing with the two participants, another participant noted that flooding is a major challenge that forces people to degrade the Nyando wetland. When it destroys their property, they are left with no option but to try and get as much from the wetland in the form of food (overfishing), unsustainable cultivation, and materials (overharvesting of reeds). The participant noted that the government can use incentives in the form of building dykes and spillways so that they are assured of their safety and the safety of their property. The participant's sentiments were echoed by a key informant from NWHSA who pointed that they are in the process of constructing dykes and spillways to control the flooding. Through these initiatives alongside dredging of the silt, the informant noted that there has been a positive response among the locals who are collaborating with them by planting trees to save the wetland. Many of the locals have also reduced cultivation along the river banks and are instead planting trees to minimize soil erosion. The majority of the respondents including those in support of the government supporting their farming initiatives agreed that building dykes and spillways would offer a sustainable solution that would incentivize the local people to conserve the wetland.

According to the assistant chief of Kakola-Ombaka, most of the private landowners do not understand the value of the wetland. This is in part due to the government's assumed neglect of the wetland since no environment officers are overseeing its sustainable use and management. The

weak enforcement of relevant wetland laws has encouraged the degradation of the wetland. However, the informant noted that if the government can improve the wetland and introduce eco-tourism activities that not only bring employment to the local people but also revenue to the larger Nyando sub-county and Kisumu County, perhaps the people could understand its value and embark on conservation. The informant added that currently, Nyando wetland is endowed with biodiversity most of which are caught up in human-wildlife conflict with the local people. Therefore, as the wildlife continues to ravage property, the local people see no value in them and feel no need to protect the wetland. Another key informant who was in support of eco-tourism activities added that the government can support the private landowners to make high-value products from the papyrus reeds such as mats that they can sell to improve their livelihood. The informant referenced VIRED, an environment-based organization in Ahero that worked with UNDP between 2005-2013 in an attempt to encourage the local people to conserve the wetland. The key informant noted that during the period, UNDP supported local people by constructing fish ponds, supporting their bee-keeping initiatives, and organic farming as alternatives. As a result, the people realized the value of the wetland and since they had economic alternatives, they did not feel the need to unsustainably use the wetland. However, the program was short-lived hence the key informant's concern with the need for sustainable incentives.

Another key informant noted that the government can introduce a stipend for the private landowners that live near the wetland so that they can have the confidence to engage in activities that preserve rather than degrade the wetland. In addition to the stipend, the government can allow the private landowners to periodically harvest the wetland goods and services for their livelihood. Through these, they will feel the need to sustainably use the wetland because they will benefit from it. In addition to the stipend, another key informant noted that several child-led families in

Kakola-Ombaka are forced to harvest wetland goods and services for food and for selling to obtain school fees. As a result, the government can expand bursaries to specifically target the children from the child-led families around the wetland to ensure that they have alternatives to obtain school fees and for survival.

The table below gives a summary of the recommended incentives that can encourage the private landowners to conserve Nyando wetland.

A Summary of preferred Incentives	
1.	Financial incentives-soft loans, stipends, bursaries for children from child-led families
2.	Construction of dykes and spillways to control flooding in the area
3.	Support sustainable farming to reduce the burden on private landowners who are farmers
4.	Ecotourism- can provide alternative sources of income

Table 4: Overview of incentives that the private landowners identified

4.8: Discussion

4.8.1: Limitations of the Current Tools for regulating private property rights

The results confirmed what several scholars have studied on the limitations of the doctrines of eminent domain and police power. The studies also affirm that these regulatory tools have not offered a complete solution to the sustainable management of wetlands since they are command and control in nature. Many private landowners were also skeptical about the regulatory tools especially when it comes to curtailing their private rights to land. Based on their understanding of the doctrines of eminent domain and police power, the people of Kakola-Ombaka believe that the doctrines of eminent domain and police power will not offer a lasting solution to their concerns

and instead it will worsen their situation by interfering with their rights to use and manage their land. The people of Kakola-Ombaka are mostly concerned with their title to land and thus feel the need to leave land for their children and grandchildren. Also, since most of the land is communal, the people feel the need to safeguard it. The majority of the people felt that eminent domain would extinguish their title to land and probably leave them poorer than they already are. They also felt that police power would dictate the way they utilize their land and thus they would not be effective in reconciling their needs with the need to conserve the wetland.

For this research, the central objective was to investigate how private landowners can be incentivized to promote the sustainable management of wetlands in Kenya. The study findings point to the fact that indeed private landowners in Nyando have contributed to the degradation of the wetland and that eminent domain and police power may not be effective at offering a complete solution to the problem. More importantly, the participants noted that conservation is very expensive since they will have to give up some of the most profitable activities on their lands. Since a majority of private landowners are against the exercise of eminent domain and police power, and the appreciation of conservation in place of unsustainable development activities, incentives are a more welcome strategy to ensure the sustainable management of wetlands. Incentives make it worthwhile and attractive for private landowners to voluntarily maintain rather than degrade wetlands in the course of their economic activities.[27]

[27] Kamal, S., Grodzińska-Jurczak, M., & Brown, G. (2015). Conservation on private land: a review of global strategies with a proposed classification system. *Journal of Environmental Planning and Management*, *58*(4), 576-597.

4.8.2: The extent to which incentivizing private landowners can promote the sustainable management of wetlands in Kenya

Research indicates that conservation on private lands is increasingly recognized due to the global biodiversity crisis that also threatens the survival of humanity.[28] Despite the expansion of conservation efforts and legal instruments regulating property rights, the hidden nature of activities on private lands makes them inefficient. The findings in this study indicate that the private land tenure system in Kakola-Ombaka has had a significant negative impact on the sustainable management of Nyando wetland thus agreeing with previous research that the private tenure system has implications for wetland conservation. Like in many areas around the world, private landowners in Kakola-Ombaka are continuously engaged in unsustainable activities such as encroachment for farming, overharvesting of papyrus reeds, and overfishing. Research indicates that human encroachment is one of the main pressures facing the sustainable management of wetlands globally.[29] This is because human encroachment is driven by several factors such as agricultural production, settlement and more importantly increasing human population.[30] As a result, these activities, the soil is loose leading to soil erosion which washes up into the wetland further contributing to flooding.

Their intensive farming activities that also involve the use of fertilizers wash up into the water leading to the death of various plants and animals. Overfishing has led to the depletion of important fish species such as *Clarias sp*. The depletion of the fish species is also attributed to varied nutrient

[28] Cortés-Capano, G., Hanley, N., Sheremet, O., Hausmann, A., Toivonen, T., Garibotto-Carton, G., ... & Di Minin, E. (2021). Assessing landowners' preferences to inform voluntary private land conservation: The role of non-monetary incentives. *Land Use Policy*, *109*, 105626. Retrieved from https://www.sciencedirect.com/science/article/pii/S0264837721003495

[29] Maithya, J., Ming'ate, F., & Letema, S. (2020). A Review on Ecosystem Services and their Threats in the Conservation of Nyando Wetland, Kisumu County, Kenya. *Tanzania Journal of Science*, *46*(3), 711-722.

[30] Ameyaw, Y., & Dapaah, G. S. (2017). The Effect of Encroachment on Ecosystem Services Provided By the Owabi Wetland and Wildlife. *International Journal of Environmental Sciences & Natural Resources*, *4*(1), 11-21.

levels in the wetland.[31]The private landowners engage in these activities because they continuously grapple with poverty. Research indicates that over 65% of residents of Nyando live below poverty lines thus making them more likely to exploit and degrade the wetland ecosystem.[32] According to Wilver Ongoro (2017), poverty is a major driving force of unsustainable use of wetlands in low and middle-income countries (LMICs).[33] With little or no income, most rural people predominantly depend on ecosystem goods and services that wetlands provide especially in extreme weather conditions such as flooding and drought. This evidence confirms that despite the existence of eminent domain and police power in regulating activities on private land, there are stronger forces such as poverty that push people to unsustainably utilize wetland goods and services thus leading to degradation and loss.

The findings herein show that the incorporation of conservation and management planning within private lands is a complicated issue that is exacerbated by social and economic factors. They agree with previous research that landowners are unwilling to participate in conservation initiatives that provide little or no benefit for them.[34] They reveal that although the private landowners prefer incentives to eminent domain and police power, they prefer incentives that will not experience setbacks due to inconsistency. They reveal that incentives have the potential of contributing towards the sustainable utilization and management of Nyando wetland. The incentives will bestow upon the individual landowners the confidence that they will still generate benefits from their land while engaging in conservation initiatives.

[31] Akoth, A. J., Mahiri, I. O., & Obiero, K. (2021). Effect of climatic and non-climatic factors on fishing activities in Lake Victoria, Kisumu County, Kenya. *International Journal of Bonorowo Wetlands*, *11*(1).
[32] Obodi, A. (2018). *The ecology and livelihoods of the local community in Ombeyi wetland-Nyando Sub County, Kenya* (Doctoral dissertation, Egerton University).
[33] Ongoro, W. (2017). Assessing the Effectiveness of National Wetland Adaptation and Management Frameworks in Kenya; The case of Nyando Wetland Ecosystem.
[34] Ibid.

Incentives are focused on attitude and behavior change and as indicated by the findings, people will be more willing to engage in conservation when they know that there are benefits. Research shows that changing attitudes through information and persuasion have had limited success since they do not influence behavior change which is the main concern in wetland conservation and sustainable management. Incentives can rapidly alter stewardship behaviors by motivating preservation, active management, and restoration activities. The reality is that conservation is very costly both in terms of opportunity cost for not fully developing land and management expenses and as indicated by the findings, many landowners will be unwilling to engage in it. Therefore, incentives such as soft loans, stipends, bursaries for children from child-led families, construction of dykes and spillways to control flooding, support sustainable farming to reduce the burden on private landowners who are farmers, and promotion of ecotourism activities can be competitive enough to encourage private landowners to conserve and sustainably manage the wetland.

These findings have confirmed that incentives can to a large extent motivate private landowners to engage in the conservation and sustainable management of wetlands in Kenya.[35]

4.8.3: The extent to which Kenya's legal framework advocates for the use of incentives in the conservation of wetlands

The government through its agencies has leveraged the two land-use control powers; eminent domain and police power, to facilitate public interest. Although they have not been extensively used to advance conservation initiatives, the lessons learned from their past application show that they may not offer a complete solution to the sustainable management of natural resources such as wetlands. Moreover, such tools tend to be effective when the problem is clearly defined, the public

[35]Wainaina, P., Minang, P. A., Nzyoka, J., Duguma, L., Temu, E., & Manda, L. (2021). Incentives for landscape restoration: Lessons from Shinyanga, Tanzania. *Journal of Environmental Management*, *280*, 111831. Retrieved from https://www.sciencedirect.com/science/article/pii/S0301479720317564

is supportive and the agencies responsible for implementation have adequate resources and capacity to enforce them.[36] With reference to a place like Kakola-Ombaka, the controls should be facilitative enough and cognizant of the conditions of the local people for effective compliance.

From the foregoing, Kenya's environmental governance uses command and control approaches which are based on standards and regulations. There is an overreliance on laws, penalties, and regulations through public agencies to constrain and organize people's economic activities. Through these approaches, the government controls how people exploit and conserve natural resources, a situation that does not auger well with people especially private landowners who want to enjoy their rights to the fullest. Despite the negative attitudes from people, scholars argue that the effectiveness of command and control mechanisms lie in their criminalization aspect.[37] Also, it is the aspect of criminalization that elicits rebellion and therefore unsustainable utilization of natural resources. For instance, the EMCA Wetland regulations under Section 14(1) prescribe how landowners, users, and occupiers should use land adjacent or contiguous to wetlands to prevent degradation without which they will have committed an offense.[38] Yet, wetlands in Kenya continue to undergo loss and degradation because people tend to undermine and or rebel against stringent laws.

Although environmental governance in Kenya has primarily been informed by the command and control approach that criminalizes activities that degrade the environment and prescribing penalties for non-compliance, there has been significant improvement to adopt more cooperative strategies such as incentives. EMCA provides incentives to encourage people to incorporate environmental

[36] Olale, P. O. (2015). *Implications of land tenure security on sustainable land use in informal settlements in Nairobi* (Doctoral dissertation, University of Nairobi).
[37] Muigua, D. K. (2021). Integrated Natural Resources and Environmental Management for Sustainable Development in Kenya. *Kariuki Muigua & Co Advocates*.
[38] S. 14(2), EMCA, Wetlands Regulations.

requirements into their operational processes. It mandates the National Environment Action Plan (NEAP) under Section 38(c) to recommend relevant legal and fiscal incentives that can encourage people especially the business community to integrate environmental concerns into their operational processes.[39] Further, EMCA mandates NEMA to create incentives that can promote the use of renewable energy sources to protect the environment from pollution.[40] Although EMCA Regulations on wetlands does not expressly use the word incentive, some of its provisions are consistent with incentives. As previously discussed, incentives make it worthwhile for landowners to conserve rather than degrade because they are assured of gaining from their conservation efforts. For instance, under Section 11, the Regulations list permitted uses of wetlands, all of which are beneficial to the communities that live around wetlands. From the findings of the research, landowners in Kakola use the wetland for fishing, collection of water for domestic use, and grazing of their livestock. These allowable activities can act as incentives to encourage them to sustainably manage and utilize the wetland goods and services especially when they understand and appreciate the value of the wetland goods and services.

There have been increased concerns that the government should shift towards incentives to protect natural resources more efficiently. These stem from the fact that people will make fundamental changes towards environmental conservation when incentives are powerful enough to reform their behavior towards the environment.[41] Under section 57(1), EMCA provides for the application of incentives and disincentives such as taxes, pollution, and fiscal incentives to promote proper environmental management and reduce environmental degradation. The law establishes that these incentives can be used for both individuals and organizations or industries. For instance, subsection

[39] S. 38(c), EMCA.
[40] Ibid, S. 49(b).
[41] Muigua, D. K. (2021). Integrated Natural Resources and Environmental Management for Sustainable Development in Kenya. *Kariuki Muigua & Co Advocates*.

2(b) provides that tax rebates can be offered to industries and establishments that invest in machinery, plants, and equipment for pollution control, conservation, water harvesting, recycling of wastes, and prevention of floods.[42] The law further elaborates that tax disincentives can be applied to deter behaviors that lead to depletion of natural resources or those that cause pollution.[43] From these provisions, it can be surmised that EMCA appreciates the role of incentives in ensuring that natural resources are sustainably utilized in line with the Constitution.[44] It is also evident that similar incentives can be used to promote the sustainable management of wetlands in Kenya.

The Wildlife Conservation and Management Act, 2013 (WCMA) establishes under part viii the application of easements and incentives in the conservation and management of wildlife. Easements can be created through a voluntary private arrangement or an appropriate application to the Environment and Land Court (ELC).[45] Parties to a voluntary easement arrangement can thus negotiate for appropriate compensation for the loss or diminishment in the value of land due to the creation of a conservation easement.[46] It follows that people who have a legal interest in land which has been subjected to an easement shall be entitled to compensation that is commensurate with the lost value of the land.[47] More importantly, WCMA establishes that people have the right to practice wildlife management and conservation as a form of gainful land use provided that they ensure healthy maintenance of wildlife in a natural and secure state.[48] It further mandates the cabinet secretary to formulate guidelines regarding the application of incentives in wildlife conservation and management adding that the guidelines should be subject to public scrutiny at every stage to

[42] EMCA, S. 57(1).
[43] Ibid, S.57(2)(a)
[44] Art. 69(1)(a) of the Constitution.
[45] S. 65(1) WCMA.
[46] Ibid S. 69(1).
[47] Ibid S. 69(3).
[48] Ibid S. 70(1)(2)(3).

encourage cooperation.[49] This provision is meant to incentivize people to conserve and manage wildlife since they can benefit from it.

In addition to these provisions, the KWS Protected Wetlands Regulations affirms the need for community involvement stating that KWS has the duty to manage the wetlands in consultation with a person or communities that hold interest in the wetland.[50] This provision provides an opportunity for the service to explore incentives to ensure that those who hold a legal interest in the wetlands sustainably utilize and manage them. Since WCMA is the focal law in wetlands management in Kenya, the above incentives can be applied to ensure the sustainable management of wetlands in Kenya.

The Wetlands Policy's objectives use a language that seeks to promote the use of incentives alongside the existing legal framework. For instance, it seeks to promote integrated management approaches to ensure wetland conservation and management in Kenya. This stems from its recognition of increased degradation of wetlands despite the existence of a comprehensive legal and policy framework to oversee the conservation and management of wetlands. The Wetlands Policy initially recognized that tenure regimes in Kenya are a major impediment in the realization of wetlands conservation. As a result, it emphasized a commitment towards addressing these impediments to ensure their sustainable management.

Despite the existence of these provisions for the application of incentives in law, Kenya's environmental governance has mostly emphasized the use of command and control approaches. The legal framework provides comprehensive guidance on how to integrate incentives in wetland conservation. The main challenge has been their little or no implementation. For instance, critics

[49] Ibid S. 76.
[50] S. 7 KWS Protected Wetlands Regulations.

of incentives argue that they do not fit every problem and that there are bureaucratic obstacles to their successful implementation. However, EMCA has tried to sidestep these shortcomings by empowering the cabinet secretary to propose appropriate incentives for every situation. This is evidence that the legal framework on wetlands advocates for the use of incentives to a large extent.

4.8.4: How to Best Incentivize Private Landowners

Building on the results of the study on how to incentivize private landowners to ensure the sustainable management of wetlands, it is evident that the best incentive measures are those that capture the factors that influence private landowners' use of wetland goods and services. For instance, in the case of Nyando wetland, some of the factors that influence their utilization of the wetland include extreme weather conditions such as floods and drought, and poverty. As a result, their preferred incentive programs focus on government support for their initiatives such as farming, building dykes and spillways to control flooding, and alternative sources of income to ensure that they do not heavily depend on wetland goods and services for survival. The results of the study indicate that when the government focuses on the challenges experienced by private landowners, they can come up with the best ways to incentivize them so that they ensure the sustainable management of wetlands. The best incentive programs for private landowners should also capture the landowner's preferences and needs without which the incentives will not be effective.

One of the best ways to incentivize private landowners can be through conservation easements which provides a popular policy option that secures the conservation and improvements on private lands. Since they are voluntary and market-based, they ensure that private landowners receive

either direct payment or tax rebates in recompense for giving up harmful activities on their land.[51] Conservation easements ensure that private landowners retain their titles to property and thus it would motivate them through financial incentives to consider conserving rather than degrading their lands. This incentive is consistent with preferred financial incentives among private landowners in Nyando where they recommend that the government can pay them a stipend for foregoing profitable activities on their land. Conservation easements can be the best way to incentivize private landowners since it is already backed by law and ensure monetary benefits in exchange for implementing conservation actions.

However, since policies that rely on monetary benefits tend to be problematic due to funding challenges, non-monetary incentives can also motivate private landowners to consider conservation actions of their lands.[52] For instance, providing training to enhance the capital of farmers can significantly improve wetland conservation outcomes by strengthening social networks and private landowners' capacity to implement conservation actions.[53] It can also be implemented alongside financial incentives such as easements because it provides greater certainty that private landowners will sustain conservation actions on their land. This incentive is consistent with one of the recommendations that private landowners in Nyando suggested; support for sustainable farming.

Another way to best incentivize private landowners is through short-term programs. This is attributed to the fact that short-term incentive programs offer more certainty as compared to long-

[51] Graves, R. A., Williamson, M. A., Belote, R. T., & Brandt, J. S. (2019). Quantifying the contribution of conservation easements to large-landscape conservation. *Biological Conservation*, *232*, 83-96.
[52] Cortés-Capano, G., Hanley, N., Sheremet, O., Hausmann, A., Toivonen, T., Garibotto-Carton, G., ... & Di Minin, E. (2021). Assessing landowners' preferences to inform voluntary private land conservation: The role of non-monetary incentives. *Land Use Policy*, *109*, 105626.
[53] Selinske, M.J., Cooke, B., Torabi, N., Hardy, M.J., Knight, A.T., Bekessy, S.A., (2017). Locating financial incentives among diverse motivations for long-term private land conservation. Ecol. Soc. 22. https://doi.org/10.5751/ES-09148-220207

term programs that are attributed with uncertainty.[54] From the results, the private landowners indicated that they were not sure whether the government would follow through with implementing incentive programs. As a result, short-term programs can enhance their confidence in the Government and encourage them to equally commit towards implementing conservation actions.

4.8.5: Lessons that Kenya can Learn from Other Countries

The use of incentives in the conservation of natural resources is not a new idea. Several countries such as the United States and Australia have used various types of incentives to encourage landowner involvement in the conservation of natural resources. Given their strong background in the use of incentives and successes in conservation, there are several lessons that Kenya can learn from some of these countries. Also, given that the legal framework on wetlands advocates for the use of incentives, it can borrow some of the successful strategies for successful implementation.

In the United States, there is a long-standing tradition of voluntary conservation that has enhanced the sustainable management of natural resources such as wetlands. It also has several incentives for wetland management such as the Wetlands Reserve Program, Environmental Quality Incentives Program (EQIP), and conservation easements.[55] The Wetlands Reserve Program is a voluntary program that allows private landowners to take part in the protection, restoration, and enhancement of wetlands that are within their property.

In exchange, the country's Natural Resources Conservation Service (NRCS) provides financial and technical support to help the landowners with their conservation and restoration efforts. The main goal of NRCS through this program is to achieve the greatest wetland values and functions

[54] Mariyam, D., Puri, M., Harihar, A., & Karanth, K. K. (2021). Benefits Beyond Borders: Assessing Landowner Willingness-to-Accept Incentives for Conservation Outside Protected Areas. *Frontiers in Ecology and Evolution*, 452. https://www.frontiersin.org/articles/10.3389/fevo.2021.663043/full

[55] Clough, P. (2000). Encouraging private Biodiversity-Incentives for biodiversity conservation on private land.

along with optimum habitat for wildlife.[56] Through it, the United States has realized long-term wetland conservation and wildlife protection on private lands. EQIP provides technical and financial incentives to farmers to make environmental improvements on their lands. Also a voluntary program, it has encouraged conservation while also improving agricultural operations. Through it, NRCS has witnessed efficient use of fertilizers, reduction of contamination from agricultural sources, increased soil health, and improved resilience to drought.[57]

On conservation easements, several states provide tax concessions to private landowners in exchange for easements created for conservation and the federal government also offers income tax deductibility for reductions in land value upon assessments. The United States displays a mix of incentive programs that encourages widespread and scattered conservation management areas. This stems from its belief that the probability of reducing biodiversity loss depends on increasing the number of sites under conservation, thus advancing conservation at a low cost. There is also successful coordination between states and the federal government towards promoting the conservation of sensitive areas such as wetlands. These present important lessons for both county and national governments in Kenya to improve their commitment towards sustainable management of wetlands through an exploration of appropriate incentives.

Australia extensively relies on market-based incentive programs to achieve environmental objectives. Dubbed the bush tender program, it aims at improving the management of vegetation on private lands so that it can realize improved environmental conservation at various levels.[58]

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[56] Natural Resource Conservation Service. Wetlands Reserve Program. *United States Department of Agriculture*. Retrieved from https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/home/?cid=STELPRDB1049327

[57] Natural Resource Conservation Service. Environmental Quality Incentives Program. *United States Department of Agriculture*. Retrieved from https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/

[58] Rolfe, J., Whitten, S., & Windle, J. (2017). The Australian experience in using tenders for conservation. *Land Use Policy*, *63*, 611-620. Retrieved from https://www.sciencedirect.com/science/article/pii/S026483771500126X

Under the program, landowners bid for the government's investment in return for providing improved biodiversity outcomes on their land. The landowners who offer the best environmental value for money receive periodic payments for management.[59] In the trial stages of its incentive programs, the government paid landowners to enter into three to six-year contracts within which the landowners would adopt a range of vegetation management practices. It also used reverse auctions to minimize the costs of conservation actions. As a consequence of the trials, the application of reverse auctions has received increasing attention and is currently a promising method of realizing the conservation of biodiversity at a low cost. In addition to this, the government has a market-based environmental stewardship program that uses price reverse auctions to protect high conservation value assets on private land. These initiatives have significantly encouraged landowners to engage in conservation initiatives and the government maintains an unwavering commitment towards the programs.

The lesson that Kenya can borrow from these is that market-based and competitive incentives are very popular with landowners and thus they translate biodiversity conservation from an abstract and complex idea to practical actions. Moreover, the voluntary nature of the incentives not only maintains landowner autonomy but are also fair which ensures that enforcement or implementation costs are minimized. More importantly, the success of the Australian incentive program proves that effective communication between landowners and the government is very important so that landowners can understand how the incentives operate and that payments should demonstrably be above environmental obligation. Australia proves that the implementation of incentives is not complicated. In Kenya, WCMA already establishes clear provisions for the use of easements in

[59] Whitten, S. M., Wünscher, T., & Shogren, J. F. (2017). Conservation tenders in developed and developing countries− status quo, challenges and prospects. *Land Use Policy*, *63*, 552-560.

conservation an indication that it could easily emulate the United States to realize the greatest wetland value and functions. For instance, Sections 65(1) and 69(1) of the Act offer guidelines on how to institute easements and compensation for landowners. The framework law EMCA also guides the use of taxes and fiscal incentives to promote the proper management of the environment. The challenge remains laxity in the implementation of such provisions and a lack of faith in the applicability and success of incentives. Kenya can therefore emulate the United States where there is proper coordination between the state and federal governments to ensure the sustainable management of sensitive areas such as wetlands. It can organize the application of incentive measures in wetland conservation under EMCA and WCMA and commit to overseeing the adoption and successful implementation of those incentives in wetland management.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1: Conclusion

While focusing on the private land tenure system in Kenya and the sustainable management of wetlands and focusing on Kakola-Ombaka as a case study area, the research sought to investigate how private landowners can be incentivized to ensure the sustainable management of wetlands. The findings indicate that indeed the private land tenure system has negative implications on the sustainable management of wetlands since private landowners tend to engage in unsustainable activities such as encroachment, unsustainable farming activities, overharvesting of papyrus reeds, and overfishing. The majority of the residents argued that due to poverty and the debilitating effects of floods and drought, they are left with no choice but to invade the wetlands for their goods and services. The laxity in the enforcement of laws relevant to wetland conservation and management also provides opportunities for the residents to unsustainably utilize the wetland. For instance, in the whole Nyando sub-county, there is only one environment officer who is tasked with overseeing all the environment-related issues. In many cases, the environment officer does not reach Kakola-Ombaka making it difficult for the relevant agencies to identify the causes of the wetland's degradation and how to ameliorate them.

The findings also indicate that majority of the residents prefer incentives to the doctrines of eminent domain since incentives will ensure that they obtain benefits from the wetlands while conserving them. They expressed concerns with eminent domain since it would result in the loss of their title to land. Given the sensitivity of land issues in Kenya today, many of the respondents noted that they would rather keep their land than give it up for conservation purposes. They also

argued that police power would dictate how they use their land and thus it would infringe on their rights to fully use their private lands. Overall, the study confirmed that the doctrines of eminent domain and police power have not offered a complete solution in the management of wetlands in Kenya. The residents, therefore, identified several applicable incentives that can encourage them to conserve rather than degrade the wetland. They include financial incentives in the form of soft loans, stipends and bursaries for children from child-led families, construction of dykes and spillways to control flooding in the area, support sustainable farming to reduce the burden on private landowners who are farmers, and ecotourism activities that can provide them with alternative sources of income. The private landowners were mostly concerned with incentives that would last and guarantee their livelihoods even as they commit their efforts to conserve the wetland.

The findings also show that Kenya has a robust legal framework that can oversee the sustainable management of wetlands. The Constitution which is the supreme law of the land emphasizes the concept of sustainable development under Article 10(1)(d) and lists it as a principle of governance to ensure the rational use of all the natural resources, wetlands being one of them. The Constitution, therefore, offers a strong backing for the need to sustainably use wetlands resources for the present and future generations. The framework law, EMCA, and focal law on wetlands, WCMA, provide clear provisions on how people should use wetlands and the resources that they provide. For instance, they prohibit draining, excavation, and erection of structures on wetlands and direct landowners to prevent the degradation of wetlands by maintaining their ecological functions. These laws also offer provisions for the application of incentives such as easements as alternatives to command and control measures. For instance, EMCA; the framework law on the environment is adequate enough to support incentives such as easements to realize the sustainable management

of wetlands. Despite the comprehensive nature of these laws and the existence of lead agencies such as NEMA and KWS, wetlands in Kenya continue to suffer unprecedented destruction thus pointing to laxity in implementation. As mentioned by participants in the FGDs and the key informants, the main challenge with the existing wetland laws lies in implementation. Proper implementation of the law will signal the government's commitment towards the concept of sustainable development and this will encourage people to invest their efforts in conservation. Also, proper implementation of the law requires sufficient resources and manpower which currently lacks and has exacerbated the degradation of wetlands. Therefore, the realization of the sustainable management of wetlands in Kenya heavily depends on a commitment to fully implement the existing laws, regulations, and policy without which the current degradation will persist.

5.2: Recommendations

In line with the findings from this research and the conclusions arrived at, several recommendations can be considered to advance the broad objective of the paper which is to analyze how private landowners can be incentivized to ensure the sustainable management of wetlands. The recommendations are organized along three main areas namely: implementation of existing laws and policy, benchmarking from other countries that have successful incentive programs, improved collaboration between the County and national governments to ensure the sustainable management of wetlands through incentives, and incentivizing private landowners through conservation easements and non-monetary incentives.

5.2.1: Implementation of existing laws and policy

The application of incentives in wetland conservation is already enshrined in law. For instance, EMCA clearly explains the use of conservation easements and legal and fiscal incentives to ensure

the sustainable management of wetlands. Under Section 57(1), EMCA also introduces the use of disincentives to deter behaviors that would otherwise degrade wetlands, and thus it is evident that the law has set a strong background for the application of incentives in wetland conservation. However, there are concerns that there is laxity in the implementation of wetlands laws, a situation that is partially blamed on lack of sufficient resources and manpower. This laxity may significantly impede the implementation of the legally provided incentives and any other that may be appropriate for various situations. This shows that there is a need to strengthen existing laws so that they can sufficiently support and ensure the sustainable management of wetlands. More specifically, there is a need to strengthen EMCA so that it can form a strong foundation for the implementation of incentives in wetland conservation. In addition, there are currently several laws, regulations, and policy that oversee the management of wetlands in Kenya most of which are open to an exploration of incentives as a viable option in managing wetlands. The legal and institutional framework for wetlands is fairly robust and addresses the most important issues that hinder sustainable management of wetlands and how to ameliorate them. The comprehensive nature of wetland legislation along with the existence of several lead agencies such as NEMA and KWS is an indication that wetlands can be adequately protected to ensure their sustainable utilization. Moreover, the legal framework for wetlands provides numerous opportunities to apply incentives to ensure the sustainable management of wetlands. Therefore, there is an urgent need to implement the existing wetland laws and policy so that they can establish a strong background for the use of incentives in the sustainable management of wetlands.

In Nyando wetland, some landowners have encroached into the wetland and are openly cultivating and overharvesting goods and resources thus contributing to its degradation. The people living around the wetland are also using harmful chemicals on their farms that wash into the river further

interfering with the ecological integrity of the wetland. The focus group discussions revealed that NEMA officers rarely frequent the wetland to assess its quality and forms of degradation. The local people reported that there is no formal framework to protect the wetland and thus they cannot protect it when the rest of the people are degrading. Other laws such as WCMA and the Wetlands Policy set out clear provisions on the protection and sustainable management of wetlands. However, there is an assumed lack of commitment towards the implementation of these laws and policies hence the continued degradation of Nyando wetland. This lack of commitment in the implementation of existing laws that are meant to oversee the sustainable utilization of wetlands may spill over when incentives are considered as a viable alternative to the command and control mechanisms.

Interviews with key informants exposed the laxity in the implementation of wetland-related laws and regulations. For instance, The Fisheries Act provides detailed provisions on how to curb overfishing and fishing of fingerlings. However, laxity in its implementation has led to a depletion in important fish species such as *Clarius gariepinus*. There is a need to start by strengthening such laws so that the local people will know that the government has an unwavering commitment to the sustainable management of the wetland and they will begin to appreciate the value of the wetland. More importantly, the implementation of wetland legislation will ensure that upon the adoption of incentives for the sustainable management of wetlands, there will be a greater success. Part of the reason why people in Nyando engage in unsustainable activities that degrade the wetland is that they lack confidence in the government's ability to effectively implement the existing wetland laws and policy. Even though they express confidence in the use of incentives, there are concerned with the government's lack of sustained commitment to protecting wetlands. By implementing the existing laws and policy, people will be encouraged that upon the introduction of incentives, the

government will not waiver in its commitment to incentivize them for the sustainable management of wetlands.

5.2.2: Benchmarking from other countries with successful incentive programs

The discussion reveals that several countries such as the United States and Australia have successfully instituted incentive programs in the sustainable management of their wetlands. Some of these programs are related to the existing incentive provisions that Kenya's legal framework on wetlands currently provides. For instance, conservation easements are a common example of incentives that is used by several countries such as the United States. Part ix of EMCA provides a detailed explanation of how environmental easements can be enforced and how people can be compensated under these incentive programs.

In the United States, part of its success story in the use of easements is based on the fact that it is determined to bring sensitive lands and natural resources under protection. Through this, it has several scattered conservation areas that continue to advance the conservation of wetlands at a low cost. There is also a strong commitment on the side of the government and the private landowners to follow through with arrangements under these incentive programs. The federal and state government also collaborate in their efforts to ensure the sustainable management of wetlands. On the contrary, most wetlands in Kenya are outside protected areas, a situation that exacerbates the degradation and loss of wetlands. It can benchmark from the United States so that it clearly understands how to successfully implement easements and other related incentives in its efforts to realize sustainable management of wetlands. Kenya already has a robust legal framework on wetlands that is also backed by a progressive Constitution and thus it can successfully implement incentives if it has a strong foundation and understanding of how to implement them.

In addition to easements, Kenya can also benchmark on other relevant incentives that suit its situation from other countries. Still in the United States, the government relies on the Natural Resources Conservation Service (NRCS) to provide technical and financial support to help private landowners with conservation efforts on their lands. This reflects one of the incentive programs that the local people in Kakola-Ombaka suggested as a viable incentive that can encourage them to conserve rather than degrade Nyando wetland. They also recommended technical support to reduce the burden on them. These are viable incentives that the government can entrench in law and implement to ensure the sustainable management of wetlands. Although EMCA already has provisions for the use of financial incentives such as tax deductions, it can still borrow from the United States which has a history of successfully implementing them. It can extensively rely on its lead agencies such as NEMA and KWS to offer financial and technical support to encourage private landowners to take up conservation initiatives on their lands. Through this, it can realize long-term conservation and sustainable management of wetlands.

Kenya should also focus on making these incentive programs voluntary since research has established that command and control mechanisms rarely encourage behavior change. Section ix of EMCA reveals that environmental easements can be imposed upon a landowner, a situation that may not encourage people to take up conservation initiatives on their lands. Instead, it can emulate nations such as Australia and the United States where landowners voluntarily enter agreements with the government to protect wetlands thus supporting efforts to sustainably manage them.

5.2.3: Improved collaboration between the County and national governments to ensure the sustainable management of wetlands through incentives

Although the study emphasizes the enormous responsibility that the private landowners play in ensuring the sustainable management of wetlands in Kenya, it recognizes that both the county and

national governments have a role to play especially in creating conducive conditions for compliance with existing laws. The theoretical framework already establishes that rewards can encourage attitude and behavior change and thus encourage people to embrace sustainable management. It argues that instead of punishing people for not doing the right things, institutions can create environments that embrace rewards as opposed to punishment. Institutions such as NEMA can design the external environment to motivate people into action, and thus the county and national governments have a vital role in ensuring the sustainable management of wetlands through incentives.

Since devolution, county governments have had departments of environments that appoint environment officers to various locations within the county. The FGDs revealed that there is only one environment officer in the Nyando sub-county whose population stands at over 500,000 people. Given the limited resources, the environment officer is restricted to the town center whereas the wetland covers various parts of the sub-county among them Kakola-Ombaka. This scenario enables further degradation of the wetland since people do not see the county's commitment towards managing its vital resources. Therefore, there should be more officers posted to the area to ensure that the wetland is properly managed and utilized. Posting more officers will also enable the county government to monitor the conservation trends in the wetland and also identify mechanisms that the county government can use to encourage landowners to willingly conserve wetlands. Such a commitment can further encourage the local people to support government initiatives to sustainably manage the wetland. It will also show that the government can be trusted to adopt and fully implement incentives for wetland conservation.

Also, through the department of environment in collaboration with NEMA officials at the county, there is a need for environmental awareness so that the local people appreciate the value of wetland

goods and services. The Wetlands Policy seeks to promote education and public awareness as one of the ways of encouraging the sustainable management of wetlands. The county and national governments should anchor themselves on this objective to enhance compliance and enforcement of wetlands conservation and management. Part of the degradation in Nyando wetland is because people perceive the wetland as a wasteland. With environmental awareness, they will understand and appreciate the benefits that they can get from the wetland. Environmental awareness will also assure the success of incentives, should they be adopted. The county government should also collaborate with the lead agencies such as KWS and NEMA to ensure the proper implementation of wetland laws.

The Fourth Schedule establishes the role of the national government towards the sustainable management of natural resources. The national government is tasked with creating a system of development that is not only sustainable but also durable and takes into consideration the livelihoods of people and the environment. It follows that while the interests of the environment are important, it is the duty of the government to ensure that people develop economically. Given that poverty is one of the drivers of Nyando wetland's degradation, the national government can channel more resources to such areas to provide alternative sources of livelihood which is also a viable incentive that can encourage people to take part in conservation initiatives. In the FGDs, the participants revealed that most of them lacked formal employment despite having educational qualifications. They argued that if they can get employment opportunities, they will not feel the need to unsustainably utilize the wetland's goods and services. This follows that the national government can play a critical role by creating alternative opportunities for employment for the people living around the wetland so that they do not overly rely on the wetland for their livelihood. For instance, in conjunction with the county government, the national government can develop

Nyando wetland and introduce ecotourism activities which will offer opportunities for employment to the local youth and contribute to the local and national economies.

5.2.4: Incentivize private landowners through conservation easements and technical and expert advice

The participants in the study recommended both monetary and non-monetary incentives. Using the current legal framework on wetlands and given that it supports the application of incentives to a large extent, this study recommends the use of conservation easements and non-monetary incentives such as technical and scientific advice to private landowners in Nyando to ensure that they sustainably manage wetlands. This recommendation builds from the participants' identification of poverty as a major factor influencing their unsustainable use of the wetland. Moreover, conservation easements are already enshrined in law, and thus there is an adequate foundation to implement it. Section 65(4) of WCMA offers guidelines on how conservation easements can be instituted to advance the sustainable management of wetlands.

Conservation easements can be a viable financial incentive program that can encourage the private landowners in Nyando to conserve rather than degrade the wetland. Given their concerns on poverty, conservation easements can significantly help them reduce poverty and therefore limit their overreliance on the wetland’s goods and services. Since conservation easements have been effective in developed countries such as the United States and Australia, there is hope that it can help Kenya to realize the sustainable management of its wetlands. The study also recommends the use of conservation easements because they are less expensive and have the potential of limiting conflicts over property rights. The study also recommends the use of non-monetary incentives such as technical and expert guidance to assist private landowners in sustainably managing their lands. Non-monetary incentives have been proven to be effective measures that guarantee that

landowners will undertake sustainable activities on their land. This is because the incentives empower them with sufficient expertise to manage their land. One of the incentives that the private landowners in Kakol-Ombaka recommended was government support to practice sustainable farming.

Government support can be in the form of technical training and expert guidance on the best farming practices that will not degrade the wetland. When used to incentivize private landowners in Nyando, it can help realize positive results in wetland management since there will be a renewed commitment to sustainably utilize the goods and services that the wetland offers. This incentive program has been successful in various countries such as in The United States where there is a dedicated program that offers expert advice and guidance to private landowners on how they can sustainably manage their lands. Kenya through NEMA and KWS can also institute a dedicated program that offers expert guidance to private landowners on how they can incorporate the interests of the environment on their lands. When conservation easements are implemented together with technical and expert advice, private landowners in Nyando can be motivated to ensure the sustainable management of the wetland.

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APPENDICES

Appendix 1: GUIDE FOR FOCUS GROUP DISCUSSIONS

UNIVERSITY OF NAIROBI

FACULTY OF LAW

Thesis Research - Master of Arts in Environmental Law

FOCUS GROUP DISCUSSION (FGD)

RESEARCH TITLE: INCENTIVIZING PRIVATE LANDOWNERS FOR THE SUSTAINABLE MANAGEMENT OF WETLANDS IN KENYA: A CASE OF NYANDO WETLAND

RESEARCH PURPOSE: The main purpose of the research is to identify measures that can be put in place to incentivize private landowners to sustainably manage Nyando Wetland.

Student Name: ……. **Reg. No**: ……

Time: …… **Date**: ……. **FGD No**: ……...

Section A: AREA PROFILE

Area Name	
Size of the Group	

Section B: GUIDING QUESTIONS

1. What are the types of land ownership around Nyando Wetland?
2. How do you use Nyando wetland?
3. What factors have influenced the way you use the wetland?
4. Currently, private land ownership in Kenya is regulated through the doctrines of eminent domain and police power. What is your perception of these tools?

5. Do you think the above-mentioned regulatory tools have been effective in ensuring that Nyando wetland is sustainably used and managed?

    a. Yes - elaborate
    b. No - elaborate

6. Incentives are the inducements that can make it worthwhile for landowners to protect, conserve and maintain natural resources instead of degrading them. Do you believe that incentivizing private landowners can yield better results in terms of conservation and sustainable utilization as compared to the doctrines of eminent domain and police power? Why?

7. In your opinion, in what ways can private landowners be encouraged to sustainably manage Nyando wetland?

Appendix 2: SCHEDULE FOR KEY INFORMANT INTERVIEW (KII)

UNIVERSITY OF NAIROBI

FACULTY OF LAW

Thesis Research - Master of Arts in Environmental Law

KEY INFORMANT INTERVIEW (KII)

RESEARCH TITLE: INCENTIVIZING PRIVATE LANDOWNERS FOR THE SUSTAINABLE MANAGEMENT OF WETLANDS IN KENYA: A CASE OF NYANDO WETLAND

RESEARCH PURPOSE: The main purpose of the research is to identify measures that can be put in place to incentivize private landowners to sustainably manage Nyando Wetland.

Student Name: ……. **Reg. No**: ……

Time: …… **Date**: ……. **KII No**: ……...

Section A: **KEY INFORMANT PROFILE**

1. Name of the Key Informant	
2. The occupation of Key Informant	
3. Experience ((in terms of years) of the Key informant in the occupation	
4. The Organization where the Key Informant Works	

Section B: GUIDING QUESTIONS

1. Generally, how has the private land tenure system in Nyando affected the conservation of Nyando wetland?
2. What actions should private landowners undertake to ensure sustainable management of Nyando wetland?

3. What do you think are the main challenges that have prevented the sustainable use of Nyando wetland among private landowners?
4. How can the above challenges be overcome?
5. In your opinion, have the doctrines of eminent domain and police power ensured the sustainable use and management of Nyando wetland?
6. Given the current situation, how do you think private landowners in Nyando can be incentivized to sustainably use Nyando wetland?
7. What provisions would be required in law to implement the above incentives?
8. In your opinion, apart from the current regulatory framework for wetland management in Kenya, are there any other legal measures that can facilitate the sustainable management of the Nyando wetland?
9. Are there any lessons that Kenya can learn from other countries on how to incentivize private landowners?

Appendix 3: CONFIRMATION LETTER, RESEARCH AUTHORIZATION, AND NACOSTI PERMIT

UNIVERSITY OF NAIROBI
CENTRE FOR ADVANCED STUDIES IN ENVIRONMENTAL LAW AND POLICY

(CASELAP)

Telephone: 254-(0)20-2314371/72/73/74/75
Extension 154 or 162
Email: caselap@uonbi.ac.ke

P.O. Box 30197-00100
Nairobi, Kenya

Ref: Z51/35679/2019

May 20, 2021

National Commission for Science and
Technology Innovation (NACOSTI)

Dear Sir/Madam

RE: REFERENCE AND CONFIRMATION LETTER FOR SILAS FRIDAH ANYANGO REGISTRATION NO. Z51/35679/2019

This is to confirm that Ms.Silas Fridah Anyango a Masters student at Centre for Advanced Studies in Environmental Law and Policy (CASELAP). She is undertaking a two year programme leading to a Master of Arts degree in Environmental Law. The title of her thesis is: "Incentivising Private Land Owners For The Sustainable Management of Wetlands in Kenya: A Case of Nyando Wetland." Research area: Kakola Location, Nyando Sub-county.

Ms. Anyango needs to undertake field work in Nyando sub-county as part her Masters studies. Any assistance accorded to her in this regard will be highly appreciated.

Yours sincerely,

UNIVERSITY OF NAIROBI
P.O.Box 30197-00100 NAIROBI
DIRECTOR
CENTRE FOR ADVANCED STUDIES
IN ENVIRONMENTAL LAW AND POLICY

Dr. Collins Odote
Director, CASELAP

THE PRESIDENCY

MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

Telephone: Kisumu 2022219/Fax: 2022219
Email: ckisumucounty@gmail.com

COUNTY COMMISSIONER
KISUMU COUNTY
P.O. BOX 1912-40100
KISUMU.

Ref: CC/KC/R.ES/1//3/VOL.IV(203)

Date: 28th May, 2021

All Deputy County Commissioners
KISUMU COUNTY

RE: RESEARCH AUTHORIZATION – MS. FRIDAH ANYANGO SILAS

Reference is made to a letter from the National Commission for Science, Technology and Innovation no. NACOSTI/P/21/10834 of 26th May, 2021 on the above underlined subject matter.

The above named is from student from University of Nairobi. She has been authorized to carry out a research on ***"Incentivizing Private Land Owners for the Sustainable Management of Wetlands in Kenya: A case of Nyando Wetland."*** The research period ends on 26th May, 2022.

Kindly accord her the necessary assistance.

JOSEPHINE OUKO
COUNTY COMMISSIONER
KISUMU COUNTY.

Cc: Fridah Anyango Silas
University of Nairobi

Received
Lillian Otieno

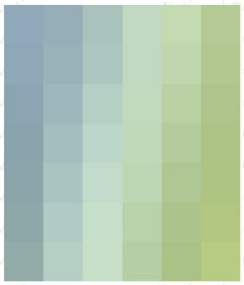
REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **841903**

Date of Issue: **26/May/2021**

RESEARCH LICENSE



This is to Certify that Ms.. fridah anyango silas of University of Nairobi, has been licensed to conduct research in Kisumu on the topic: INCENTIVISING PRIVATE LAND OWNERS FOR THE SUSTAINABLE MANAGEMENT OF WETLANDS IN KENYA: A CASE OF NYANDO WETLAND for the period ending : 26/May/2022.

License No: **NACOSTI/P/21/10834**

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