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THE CONTRIBUTIONS OF THE MONTREAL PROTOCOL AND RAMSAR CONVENTION TO ENVIRONMENTAL MANAGEMENT IN CAMEROON (1989 – 2021)

A DISSERTATION DEFENDED ON THE 19 JULY, 2023 TO OBTAIN MASTERS DEGREE IN HISTORY

Specialization: History of International Relations

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JULY 2023

To

my parents, Aloysius Atabong and Maria Legejuo.

SUMMARY

ACKNOWLEDGEMENTS

Such a work could not be accomplished by independent efforts. To this effect, I humbly want to thank the following personalities who either directly or indirectly contributed to the success of this work. In the first place, I will like to express my gratitude to my supervisor, Professor George Fuh Kum who accepted to supervise this work. His availability, patience, encouragement, care and openness towards me immensely contributed in bringing this work to life. My appreciation also goes to Professor Chamberlin Nenkam who corrected and modified this work up to this level. In addition, My gratitude also goes to professor Virginie Wanyaka, Raymond Ebale, Fautin Kenne, Cyrille Bekono and all the lecturers of the department of history for inculcating in me all the skills I needed to produce this historical work.

I express much gratitude to all my informants who made out time to listen to me and reply my questions. They provided me with the information I needed in building this work. Special thanks to the director of the Ozone National Bureau, the director of the National Ramsar Bureau and the chief of service at the Yaounde III council in charge of the environment, hygiene and sanitation, Marcel Michel Assiga for the worm welcome they gave to me and the information they provided me was so important that my work could not do without. I won`t forget all the documentation centers which opened their doors to me. This include the documentation centers of MINEF and MINEPDED.

I equally recognize the efforts of a special friend, Mirabel Guimdo who was very instrumental in my success. She stood by me since from the time I entered university and always encouraged me to keep going forward despite all hardships. Her moral assistance motivated me to go into the Masters Degree program. In same vain, I acknowledge and greatly appreciate people like Elizabeth Tawa for her availability and moral support. She was also one of those who stood by me, boosting my moral whenever it ran low. I sincerely thank Emmanuel Azong Tebei for the corrections he made on my work.

I am also immensely grateful to all members of my family who assisted morally and financially, especially my brother, Vitalise Lekeaka, for being an inspiration for the topic of my study. His material and academic support were very helpful in shaping this work. I remain indebted to God my creator, who protected me and carried me right up to this level.

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LIST OF ABBREVIATIONS AND ACCRONYMS

CEMAC	*Communauté Économique et Monétaire de L`Afrique Centrale*
CFCs	Chlorofluorocarbons
CMN	Cameroon Mangrove Network
CPDM	Cameroon People`s Democratic Movement
CUE	Cameroonian Union of Enterprises
CWCS	Cameroon Wildlife Conservation Society
FAEM	*Société Anonyme de Fabrication D`Appareils Electro-ménagers*
GEF	Global Environmental Facility
GHG	Green House Gases
GIZ	*Deutsche Gesellschaft für Internationale Zusammenarbeit*
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
IEL	International Environmental laws
IFC	*Institut Française du Cameroun*
IRIC	International Relations Institute of Cameroon
IUCN	International Union for Conservation of Nature
LCBC	Lake Chad Basin Commission
MINAT	*Ministère de L`Administration Territoriale*
MINEE	*Ministère de L`Eau et de L`Energie*
MINEF	Ministry of Environment and Forests
MINEFI	Ministry of Economy and Finance
MINEP	Ministry of the Environment and Nature Protection
MINEPDED	*Ministère de L`Environnement, de la Protection de la Nature et du Developpement Durable*
MINFOF	*Ministère des Forêts et de la Faune*
MINSANTE	*Ministère de la Santé Publique*
NGO	Non Governmental Organization
ODS	Ozone Depleting Substances
OMC	Ozone Monitoring Commission
RECs	Regional Economic Communities
SDF	Social Democratic Front
SEMRY	*Société D`Expansion et de Modernisation de la Riziculture à Yagoua*

TCA	Technical Cooperation Agency
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNIDO	United Nations Industrial Development Organization
UNO	United Nations Organization
UV	Ultraviolet
WWF	World Wildlife Fund

ABSTRACT

This study seeks to understand how the Montreal protocol and Ramsar convention were implemented in Cameroon between 1989 and 2021. In other words, it examines what contributions these two international environmental laws have brought to environmental management in Cameroon. It establishes that, before the ratification of the Montreal protocol in 1989, no actions existed in the country in respect to ozone layer protection. In the case of the Ramsar convention, early measures had already been taken before 2006 to protect wetland ecosystems in the country. Data used in this study was obtained from primary and secondary sources. Primary data was gotten from oral and archival sources. Secondary data was gotten from published and unpublished literature. All the data obtained were analyzed using the qualitative and quantitative approaches and the following results were obtained. Cameroon implemented the Montreal protocol by putting in place institutions such as the ozone monitoring commission, formulating national laws on ozone layer protection, sensitization, ban on the import of equipment containing ozone depleting substances etc. The Ramsar convention on the other hand was implemented through the designation of wetlands of international importance, sensitization and education, decentralization of the fight for wetland protection to councils, reforestation of mangroves etc. However, certain factors such as institutional weaknesses, lack of competence, corruption, weaknesses related to sensitization, weak implementation of laws etc, stood out as stumbling blocks to the effective implementation of these international environmental laws in Cameroon. The study ends by pointing out the fact that, to overcome these problems, there was need to ensure an effective implementation of national laws, fight against corruption, make greater use of modern communication strategies to sensitize, appointing environmentalists, and not politicians to head environmental institutions etc.

Key words: Ozone layer, Wetlands, Protocol, Convention, Environmental management.

RÉSUMÉ

Le thème de cette étude s'articule autour de "Les contributions du protocole de Montréal et de la convention de Ramsar à la gestion de l`environnement au Cameroun". L`objectif majeur de ce travail vise à comprendre comment le protocole de Montréal et la convention de Ramsar ont été mis en œuvre au Cameroun. Ce travail examine aussi les contributions de ces deux lois internationales en ce qui concerne la gestion de l'environnement au Cameroun. Cependant, il est important de savoir qu'avant la ratification du protocole de Montréal en 1989, aucune action n'existait au pays en matière de protection de la couche d'ozone. C'est ainsi que des mesures précoces avaient été prises avant 2006 pour protéger les écosystèmes des zones humides au Cameroun d'après la convention de Ramsar. Les données utilisées dans cette étude ont été obtenues à partir de sources primaires et secondaires. Les données primaires ont été obtenues à partir de sources orales et archivistiques ainsi que les données secondaires ont été obtenues à partir de la littérature publiée et non publiée. Toutes ces données obtenues ont été analysées en utilisant les approches qualitatives et quantitatives, cela a aboutis aux résultats suivants: Le Cameroun a mis en œuvre le protocole de Montréal en mettant en place des institutions telles que la commission de surveillance de l'ozone, en élaborant des lois nationales sur la protection de la couche d'ozone, la sensibilisation, l'interdiction d'importer des équipements contenant des substances appauvrissant la couche d'ozone, etc. Désignation des zones humides d'importance internationale, sensibilisation et éducation, décentralisation de la lutte pour la protection des zones humides vers les communes, reboisement des mangroves etc. Cependant, certains facteurs tels que les faiblesses institutionnelles, le manque de compétence, la corruption, les faiblesses liées au mode de lois, etc., sont apparues comme des pierres d'achoppement à la mise en œuvre effective de ces lois internationales sur l'environnement au Cameroun. En conclusion l'étude souligne le fait que, pour surmonter ces problèmes, les autorités doivent assurer la mise en œuvre effective des lois nationales, lutter contre la corruption, utiliser davantage les stratégies modernes de communication pour sensibiliser, nommer des environnementalistes et non des politiciens à la tête des établissements environnementaux etc.

Mots clés: *Couche d`ozone, Zones humides, Protocole, Convention, Gestion de L`environnement.*

GENERAL INTRODUCTION

General context

It is commonly believed that the industrial revolution of the 18th century marked the genesis of contemporary environmental problems such as climate change and pollution. During this period, the machines which were being used depended on fossil fuels. The continues burning of these fossil fuels resulted to atmospheric pollution. It equally resulted to an increase in greenhouse gas amounts in the atmosphere resulting to global warming. Furthermore, there was increase pressure on natural resources during this period due to increase in population, leading to the depletion of natural resources. If we should follow this reasoning, then we can conclude that before 1760 (this is commonly believed to be the exact date in which the industrial revolution began. However, this date remains a subject of debate), humans lived in agreement with the environment.

Based on recent discoveries, one will quickly realize that the disciples of the above reasoning looked at environmental issues in general from a limited perspective. This is so because the environmental history of the period before 1760 proves that the industrial revolution was rather a catalyst, and not the genesis of contemporary environmental problems. Anthropologists have discovered evidence of human induced plant and animal extinction from around 50000 BC.[1] Are these not also major environmental problems the world still faces till today? Abusive hunting and deforestation are very old environmental problems and are among the first, if not the first environmental problems which man was confronted to. Because of this, we can`t conclude that the industrial revolution was the genesis of contemporary environmental problems.

However, faced with all these environmental problems, the second half of the 20th century witnessed a lot of movements calling for the adoption of global measures to protect the environment.[2] This is what gave birth to environmental management which is today an academic discipline. These movements succeeded to force environmental issues into global politics. As one of its responses, the United Nations spear headed the formulation of many international environmental conventions in respect to environmental protection and it`s

[1] W. Rex, A brief history of environmentalism, paper retrieved from https://www.greenpeace.org consulted on 02/03/2023 at 04:39pm.

[2] Remember that both the UNO and OAU rebaptised AU only took into account environmental issues in 1968. Also, issues related to the environment have gained so much importance, this explains the high number of international laws (about 3700) which exist in connection to the environment alone.

sustainable management. These conventions are also known as international environmental laws (IELs). States have been ratifying and implementing these IELs. By implementation, we mean all the measures taken by administrative and competent environmental authorities, to realize the objectives of an IEL in a given country.[3] One thing to be noted is that, even though environmental problems are very old, their consideration and inclusion into global politics is rather recent. All the IELs which exist have greatly contributed to environmental management at both the national and international levels. The impacts of an IEL on environmental management in a given territory can only be best evaluated through the manner in which it was implemented in the said territory.

Cameroon, since independence has ratified many international environmental laws. Each of these conventions addressed particular environmental aspects. Some examples of such conventions ratified by Cameroon include: convention concerning the use of white lead in painting (1960), protocol for the prohibition of the use in war of asphyxiating, poisonous or other gases (1989), international convention for the regulation of whaling (2005), African convention on the conservation of nature and natural resources (1968), convention on wetlands of international importance, especially as waterfowl habitat (2006), Montreal protocol on substances that deplete the ozone layer (1989), convention on the conservation of migratory species of wild animals (1980) etc.[4] All these international environmental agreements have had various effects on environmental management in Cameroon. This work studies the Montreal protocol and Ramsar convention and brings to lamp light their various contributions, in their various domains, to environmental management in Cameroon.

A good understanding of the road taken by Cameroon to ratify the Montreal protocol and Ramsar convention can better be achieved by first examining the international events that led to the formulation of these IELs. In respect to the ozone layer, concerns about its depletion due to CFCs (Chlorofluorocarbons)! and other anthropogenic substances first arose in the early 1970s. During this time, scientists warned that anthropogenic release of CFCs into the atmosphere was affecting the ozone layer, hindering its ability to prevent the sun`s UV (Ultraviolet) rays from reaching the earth surface. This off course comes with negative

[3] O. Ruppel et al, Environmental law and policy in Cameroon towards making Africa the tree of life, Baden-Baden, KAS, 2018, p.151.
[4] R. Mitchell, Multilateral Environmental Agreements to which Cameroon has taken membership actions, paper retrieved from https://www.iea.uoregon.edu/country-members/Cameroon.com consulted on 12/12/2022 at 12:19pm.

environmental consequences. To mitigate the problem, a UNEP (United Nations Environmental Program) conference was held in 1977 in other to adopt a global action plan on the ozone layer.

In 1981, negotiations to produce an international agreement to protect the ozone layer kicked-off. These negotiations led to the birth of the Vienna convention for the protection of the ozone layer which was adopted in March 1985.[5] However, the Vienna convention was referred to as a "toothless treaty". This can be explained by the fact that the treaty made no mention of CFCs, it had no provisions regulating the use of CFCs which were the cause of ozone layer depletion. Also, the treaty was not legally binding on the parties. From the above, we realize there was therefore the need to come out with a protocol to make up for its weaknesses. It was in this context that negotiations for a protocol commenced and by September 1987, an international accord was signed in Montreal commonly referred to as the Montreal protocol.[6] This protocol was designed to repair the ozone layer through global reduction and elimination of ozone depleting substances.

Regarding wetland protection, history traces the origin of the movement for their protection to the 1960s.[7] The movement was led by a group of ornithologists who were worried about the global loss of migratory bird habitat. This loss of migratory bird habitat was attributed to factors such as pollution, infrastructural development and armed conflicts between states. It was still in the 1960s that the idea of an international convention to protect wetlands came about when Doctor Luc Hoffmann, Swiss ornithologist, philanthropist and co-founder of the World Wildlife Fund (WWF), sent a proposal to the International Union for the Conservation of Nature (IUCN).[8]

The proposal called for an international program on the conservation and management of marshes, bogs and other wetland types.[9] This was referred to as Project MAR.[10] The global loss of wetlands brought about the need to mobilize nations and seek common solutions to this problem. As a result, international conferences were organized with the goal of addressing the issues of management and conservation of the habitat of these birds. Such conferences were

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[5] Report summary of 10-14 October 2016 on the Vienna convention and Montreal protocol on substances that deplete the ozone layer, p.2.
[6] D.Kaniaru, *The Montreal protocol: celebrating 20 years of environmental progress, ozone layer and climate protection*, Geneva, UNEP/Earthprint, 2007, pp.43-44.
[7] AWSG, "Short History of the Ramsar Convention on Wetlands of International Importance", *Journal for the east Asian-Australasian Flyway,* January 2021, pp.2-3.
[8] *Ibid.*
[9] *Ibid.*
[10] This name was chosen because "MAR" is the first three letters of the word for wetlands in several languages. For example we have marches, marecages and marismas.

organized for over ten years from 1962 to 1971, added to technical meetings and behind-the-scene discussions to come out with a convention which could be globally accepted considering the political climate of the time (political tensions between the communist east and capitalist west). The outcome of all the above was the Ramsar convention of 2rd February 1971 originally signed by 18 nations.[11]

While all these events were ongoing in the international scene, many African countries and Cameroon in particular had just been freed from the hook of colonialism. After the attainment of independence in 1960 and 1961 for French and British Cameroons respectively, the young nation which added to independence had just been reunified paid little attention to environmental problems. The country had other priorities at the time such as consolidating national unity, poverty reduction, infrastructural development and creating employment opportunities for its citizens. This does not however mean that environmental issues were completely absent from the country`s public actions.

This is so because Cameroon participated in numerous international environmental meetings such as the Stockholm conference in 1972 and set up institutions such as the Standing Committee on Man and the Biosphere (MAB COMMITTEE) in 1984 to monitor the evolution of the environment in Cameroon. Also, sectorial environmental laws existed in Cameroon. This brings us to understand that there were some efforts adopted by Cameroon to address environmental problems. But the impact of these measures were not felt in the national territory (these laws were not effectively applied).

This explains why we cannot conclude that environmental problems were among the preoccupations of Cameroon`s policy makers by this time.[12] Despite the fact that environmental problems were not a major preoccupation in Cameroon during the early years after it attained independence, the environmental history of the country holds 1989 and 2006 as dates in which it ratified the Montreal protocol and Ramsar convention respectively. It still remains a debate as to whether the ratification of these multilateral environmental treaties and many others were done out of pure environmental concerns. Authors remain divided on the subject.

Nonetheless, certain authors believe that external factors were at the origin of environmental considerations in Cameroon. According to them, the environmental policies of

[11] M. Geoffrey , *The Ramsar convention on wetlands: its history and development*, Gland, RCB, 1993, p.4.
[12]D.Bitondo, "Environmental assessment in Cameroon: state of the art", *Journal of impact assessment and project appraisal*, Vol 18, February 2012, p.33.

Cameroon were influenced or oriented by external powers.[13] This state of things can be explained by the fact that in international relations, stronger states generally impose their views on weaker ones.[14] Even if this believe is proven to be true, environmental considerations in Cameroon were also influenced by internal factors.

These internal factors among others included the fact that the country was also faced with certain environmental problems. The ratification of the Montreal protocol and Ramsar convention could also be interpreted to mean Cameroon had understood the importance of protecting its natural environment. However, the role of external pressure cannot be belittled. It also accounts for the existence of environmental talks among policy makers in the country today. Nevertheless, the above revelations do not eliminate the fact that Cameroon just like many other countries ratified the Montreal protocol and Ramsar convention and has since then put in a lot of efforts to implement the demands of these treaties at the national level.

Conscious of the dangers of the destruction of the ozone layer, Cameroon created the ozone national bureau. She was to implement her ozone project in Cameroon through the ozone national bureau. Another fascinating major taken by Cameroon was the ban through Decision N^0 985/MINDIC/CAB of 15 November 1996, on the importation into the country of equipment containing substances which destroy the ozone layer. These and many others which will be examined in the course of this work were actions taken by Cameroon in view of protecting the ozone layer.

In the domain of wetlands protection, the government through ARRETE N^0 063/CAB/PM of 08 March 2007 created a national committee on wetlands and placed under the supervision of the minister of the environment and nature protection.[15] It was charged with the mission of assisting the government in the coordination and application of the Ramsar convention.[16] The government of Cameroon equally carried out sensitization campaigns so as to integrate the local population into its efforts towards wetland management and protection. The transfer of powers to councils in 2015 by the government of Cameroon was also a

[13] N.L.Nsana, "La politique environementale du Cameroun à la lumiére de la coopération internationale : une analyse de l`influence des grands acteurs environnementaux globaux", Masters dissertation in International Relations, University of Yaounde II-IRIC, 2015, p.20.
[14] *Ibid.*
[15] Arreté N^0 063/CAB/PM du 08 Mars portant création du Comité National Ramsar sur les zones humides du Cameroun.
[16] Report on the implementation of the integrated coastal management for the Kribi-Campo area in Cameroon, p.14.

remarkable effort adopted to protect wetlands in the Country.[17] Still in an effort to implement the Ramsar convention, reforestation projects were launched in the country. These majors and others will be analyzed in this work.

Significance of Study

Looking at the interactions between man and his environment, we quickly realize the need to re-establish harmony between man and his surrounding environment. There is a great need to re-enforce measures oriented towards the sustainable exploitation of natural resources. Base on the above, the findings of this work are of great significance to many stakeholders which include: the government, researchers, Cameroonian citizens, environmentalists, non-governmental organizations and every other environmental institution.

Cameroonians will be educated on problems concerning the ozone layer and wetlands. Hopefully, they will be able to understand the value of these natural resources and refrain from activities that could lead to their destruction. The outcome of this should be the birth of an ecologically friendly Cameroonian society.

To researchers, environmentalists and NGOs, this work concludes by presenting some additional measures which could be adopted to address problems related to the degradation or destruction of the ozone layer and wetlands.

Through this work, policy makers can evaluate the implementation of the Montreal protocol on phasing out substances which deplete the ozone layer and the Ramsar convention on wetlands protection, especially as waterfowl habitats. Also, this work will help them understand the limits of existing policies put in place to arrest problems related to the ozone layer and wetlands, strengthen and/or establish more efficient policies to assure the effective implementation of these international environmental laws.

Theoretical Framework

A theory could be seen or understood to be a formal set of ideas which are often intended to provide explanations on why something happened or exist. It could also be understood as a formal set of ideas which are employed to explain facts or events or to provide understanding of how something works. The development of theories help to explain, predict and enhance the understanding of a phenomena. They are known for their ability to challenge

[17] Degree N^0 2015/1373/PM of 8 June 2015 to lay down rules for exercising some powers transferred by the state to councils on the environment.

and extend the frontiers of knowledge within the limits of critical bounding assumptions. [18]So far, many environmental theories have been formulated which include: the behavioral change model, Reasoned/Responsible action theory, model of human interaction with the environment, tragedy of the commons, the designer theory etc. This study makes use of the following theories:

The Environmental Model of Human Interaction

This theory was proposed by Hammond in 1995. It revolves around the four interactions which exist between human activities and the environment. According to this model, humans obtain minerals, food, fibers, energy and many other natural resources from the surrounding environment. The continues and increasing exploitation of these resources leads to their depletion. Also, areas from which man obtains these resources are highly polluted by humans, leading to environmental degradation or destruction. In a nutshell, man is surrounded by natural ecosystems on which he depends for survival. However, man himself through various activities such as deforestation, reclamation, urbanization and many others, is destroying these strategic ecosystems.

Wetland ecosystems in Cameroon provide many important services such as recreational opportunities, climate change mitigation, water filtering and storage, fishing, fire wood for heating etc. The environmental model of human interaction proposed by Hammond ties with this study in that, its arguments are a reality in Cameroon. This is so because, despite the fact that many Cameroonians depend on wetland resources for a living, studies show that wetland resources across the country are being over exploited, leading to their depletion. The biological and physical characteristics of Cameroonian wetlands are fast undergoing negative transformations. This can be explained by the fact that, Cameroonians carried out activities on wetland areas such as reclamation for construction or other developmental purposes, deforestation, bush burning for agricultural purposes and the release of dangerous chemicals into wetland areas.[19] This last phenomenon has always been a reality, particularly in coastal industrialized regions of the country. Among measures taken to arrest this problem in Cameroon, the country ratified the Ramsar convention on wetland protection in 2006.

[18] E. Akintunde, "Theories and concepts for human behavior in environmental preservation", *Journal of environmental science and public health*, Vol 1, 30 august 2017, p.1.
[19] F. Tazoacha, Managing wetland ecosystems to guarantee water security in Cameroon paper retrieved from https://www.ideasforpeace.org consulted on 02/05/2022 at 01:41pm.

However, a critical observation of this theory shows that the theory lays more emphasis on the negative consequences of human interventions in the environment. The theory fails to note that not all human interventions into the environment end up destroying the environment. The creation of reserves, the protection of some plant and animal species and finally, the rehabilitation of some natural ecosystems just as observed in Cameroon in the Waza-Logone wetland area by the Cameroonian government in collaboration with other partners, constitutes some human interventions into the environment which turned out to be beneficial to the environment.

Behavioral Change Model

This reasoning holds that if people are better informed, this will increase their knowledge about environmental issues. Consequently, they will behave in an environmental friendly manner.[20] The ideas presented by this model also fall in line with the findings of this study. It's clear that this model proposes sensitization and education as solutions in creating environmental consciousness, consequently protecting the environment. The findings of this study shows that one of the methods which was employed and applied by policy makers in Cameroon to implement the Montreal protocol and Ramsar convention was sensitization and education. The Montreal protocol in its article 9(2), makes it an obligation for parties to sensitize their populations on the negative effects of ODS emissions into the atmosphere.[21] It was hoped that such knowledge will create an environmental consciousness in people and limit environmental destruction. This model however falls short in that, an increase in environmental knowledge does not guarantee a change in attitudes. Carelessness and economic conditions still influence people to act to the disadvantage of environmental health, despite having knowledge of the negative impacts of their actions on the environment.

The Tragedy of the Commons

According to history, Garrett James Harding was the brain behind this theory. He was a biologist by profession and remains an important figure in the history of theories. This theory was proposed in 1968 and describes a situation where common or shared environmental resources are over used, exploited and eventually deplete, a situation which becomes risky to everyone involved. Garrett argues that some restrictions should be implemented to prevent this.

[20] Ibid.
[21] Montreal protocol on substances that deplete the ozone layer, paper retrieved from https://www.wpunil.ch consulted on 22/12/2021 at 12:34pm.

It should be noted that the term "commons" as use in this theory refers to wetlands, oceans, rivers, the atmosphere etc. In a legal context, the term "commons" makes reference to a type of property which is neither private nor publicly owned. It rather belongs to all members of the society.

In respect to the atmospheric ozone, Harding rightly predicted that, the over use or exploitation of a natural resource will lead to its depletion, a situation which will end up becoming dangerous for the society as a whole. The findings of this study showed that the unsustainable use of the atmosphere through the release of ODS in Cameroon in particular and the world in general leads to ozone layer depletion. As a result, Cameroonians were exposed to skin cancers, eye cataracts, immune system disorders etc.[22] The destruction of wetlands which were acting as carbon sinks, led to the release of carbon dioxide into the atmosphere causing climate change, which in turn caused floods, irregular rainfalls, food insecurity, no need to mention the fact that these factors constitute a danger to human existence on earth.

Despite the great contributions of this theory to knowledge, it still fell short in that, it proposes nationalization as a solution. A solution according to which a state should assume total ownership of such resources and restrict access to citizens. In Cameroon, wetlands are government property and it's illegal for citizens to carry out any developmental projects in such areas. Despite this fact, realities in the field tell a different story. This shows that nationalization as a solution proposed by Harding does not apply in this context.

Literature Review

Due to the fact that environmental issues have successfully made their way into national and international policies, this work makes a review of other works which have a direct or indirect connection to environmental management. In the work of Kenlack, entitled *"occupation des bas-fonds et risque d`inondation dans l`arrondissement de Yaoundé VI",* he notes that wetland areas are risky zones for human habitation due to the fact that such zones are frequently inundated. Also, he clearly shows in his work that despite the dangers involved in settling in such areas, people have not refrained from settling or carrying out developments in these areas. His work shows the evolution of human settlement in the area under study and the impacts this has had on the wetland areas. Furthermore, according to the author, people are pushed to settle in such areas partly due to the complex nature of obtaining land titles for lands

[22] S.R. Kumar, "Ozone layer depletion and its effects: A review", *International Journal of Environmental Science and Development*, Vol 2, February 2011, PP.35-36.

out of risky or wetland areas.[23] This work was helpful to my study because it permitted me understand how human occupation of wetland areas turn out to be dangerous for wetland ecosystems. Also, my study benefited from the push factors to wetland occupation exposed by the author. Nevertheless, this work is limited to Yaounde VI meanwhile my work studies this phenomenon beyond the Yaounde VI council area. Furthermore, my study presents other factors such as poverty and ignorance as additional causes of wetlands occupation and consequently, their destruction.

Another fascinating study is that of Hughes in a work titled "A directory of African wetlands". He focuses on the presentation of wetlands and the various types which exist in Cameroon. We have for example the tidal forest found on the coast between the Cross River and Wouri estuary, the coastal plain areas and its fresh water swamp forest, the floodplain areas in the north like the Logone-Chari floodplain, crater lakes found in the southwest, west and northwest regions etc. These areas contain endemic fish species and are havens for births. The richness of Cameroonian wetlands in respect to their flora and fauna is not left out. The work presents a list of wetland plants in Cameroon such as Raphia Vinifera, Pandamus candela, Avicennia Africana etc. In respect to wetland fauna, the work notes the presence of fishes, amphibians, reptiles and many others in Cameroonian wetlands.[24] My study benefited from the presentation of Cameroonian wetlands, wetland types, flora and fauna contained in this work. My study went further to make a distinction and presentation of wetlands of international importance and those of national importance. Beyond just presentation, my study also brings into lamp light various benefits of wetlands to man and the environment.

In another work titled "governance of ecosystem services: lessons learned from Cameroon, China, Costa Rica and Ecuador" published by the IUCN, it is argued that before the 1990s, Cameroon cared less about environmental issues. During the colonial and early post-colonial period, there existed some laws and regulations governing the use of land and natural resources but did not meet the qualifications of an environmental law. It was only in the 1990s that with the help of the international community, Cameroon was able to put in place a national environmental management plan. This was triggered by the 1996 constitution which attached great importance to the environment and thus, environmental law is quite new in Cameroon.

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[23] G.T.Kenlack, "occupation des bas-fonds et risqués d`inondation dans l`arrondissement de Yaoundé VI", Mémoire de master en géographie du risque dynamique et environnemental, Université de Yaoundé I, 2019, pp.13-54.

[24]R. Hughes, *A directory of African wetlands*, Gland, IUCN, 1992, pp.457-465.

[25]The work shows the origin of environmental considerations in Cameroon which my study greatly benefits from. My study however makes a more detailed analysis on the origin of environmental considerations in Cameroon from a historical perspective, its evolution and reveals the early environmental institutions with general competence on environmental issues which originated due to Cameroon`s desire to bring in her own contribution to the global movement for environmental protection.

Other authors like Roggeri in his work titled "Tropical fresh water wetlands: A guide to current knowledge and sustainable management", studies on analyzing the impacts of some human projects on wetlands in Cameroon, examines the impacts of human activities on wetland areas taking the construction of a local dam in Logomatya as case study. The study clearly reveals how human intervention or invasion of wetlands leads to a dysfunction in the normal functioning of this ecosystems. Added to the negative consequences of human invasion of the Logomatya wetland area, is an increase in the duration of flooding in this area. [26]The study made by this author on human impacts on wetlands contributed to the development of my study. A point of divergence however intervenes based on the fact that my own study goes beyond anthropogenic factors to show that there are natural factors such as climate change who`s impacts on wetlands should not be underestimated.

Mangroves occupy a surface area in Cameroon of 196 184 km^2 as revealed by the work of Zogning titled "*Dynamique des mangrove des marges méridionales de Douala: Etude des cas de Youpwệ, New-priso et Bois des singes aux périphéries de Douala deuxième".* It is principally distributed between the Rio Del Rey and Cameroon estuary. Due to the ecological, biological and economic importance of mangroves, they are protected in Cameroon by law N^0 96/12 of 05 August 1996 fixing the judicial framework for environmental management in Cameroon. The author notes that this law is however not effectively applied in Cameroon and consequently, these mangroves are exposed to uncontrolled exploitation. The work establishes a link between the protection of mangroves in Cameroon and the Ramsar convention and further shows certain measures taken by the country to protect these mangroves. [27]The measures enumerated in this work which were taken by the government to protect mangroves were

[25] IUCN, *Governance of Ecosystem Services: lessons learned from Cameroon, China, Costa Rica and Ecuador*, Gland, IUCN, 2011, pp.13-21.
[26] H. Roggeri, *Tropical fresh water wetlands: A guide to current knowledge and sustainable management*, Vol 112, Berlin, Springer science and business media, 2013, pp.179-180.
[27] F. R. Zogning, "Dynamique des mangrove des marges méridionales de Douala: Etude des cas de Youpwệ, New-priso et Bois des singes aux périphéries de Douala deuxième", Mémoire de master en géographie du risque dynamique et environnemental, Université de Yaoundé I, 2013, pp.39-46.

beneficial to my study. This work studies a particular wetland type in a particular Cameroonian city, contrary to mine which covers all wetland types on the national territory.

Furthermore, the work of Nsana titled *"La politique environementale du Cameroun à la lumiére de la coopération internationale : une analyse de l`influence des grands acteurs environnementaux globaux*" shows that the environmental policies of Cameroon are oriented by the powers of the northern countries. The author supports the fact that external factors (international environmental actors) were at the origin of environmental considerations in Cameroon. Since the northern states constitute the principal source of funds for international organizations, they are able to dictate their interests on the international agenda. In a nutshell, this work proved that external factors or powers have unceasingly influenced the environmental policies of Cameroon. [28]The analysis made by this work on the influence of external powers on environmental considerations or policies in Cameroon were of great help to the development of my own study. Nevertheless, while this work shows the influence of external powers on the environmental issues in Cameroon, my own study shows the influence of two environmental laws (the Ramsar convention and Montreal protocol) on the management of Cameroonian wetlands and the ozone layer, which constitute two important environmental components.

The work of Mbuh titled "Physical and human impact assessment on the mount Cameroon coastal landscape" clearly shows to what extend human activities such as industrial crop farming and industrial activities have resulted to accelerated degradation in the mount Cameroon coastal land scape. The release of untreated industrial waste has been of negative impact on this wetland area. It threatens marine life and the health of the population who inhabit the area. The work sustains the idea that human needs have forced them to become a threat to fragile coastal ecosystems, rendering the coastal regions environmentally unstable. The work further makes some analysis on some institutional problems such as the lack of collaboration between the ministries with sectorial competences on environmental issues which make it difficult for the government to come out with a real environmental policy. Also, the government of Cameroon has ratified many international conventions on environmental protection but find it really difficult to implement these conventions due to certain reasons such as the lack of concern expressed by the population.[29] The difficulties faced by the government in the

[28] L.N Nsana, La politique environementale du Cameroun à la lumiére de la coopération internationale : une analyse de l`influence des grands acteurs environnementaux globaux, Mémoire de master en Diplomacie, Université de Yaoundé II-IRIC, 2015, pp.1-22.
[29] M.J. Mbongowo, "Physical and human impact assessment on the mount Cameroon coastal landscape", Masters Dissertation in geography, University of Yaounde I, 2003, pp.21-69.

application of international environmental conventions was of help to my study. This work however speaks of international environmental treaties ratified by Cameroon as well as the difficulties its facing to implement them, in a general manner. My study takes the Montreal protocol and Ramsar convention as case studies.

In a book titled "Protection of the Ozone Layer" published by the United States environmental protection agency, the origin of CFCs are clearly made known. According to the institution, CFCs were first created in the United States over 60 years ago. Later on these CFCs began to be used for the manufacturing of many things such as air conditioners and refrigerators. They were equally used for other industrial processes. At that time, the negative impacts of these CFCs on the ozone layer found in the stratosphere were still unknown to man. The production and emission of CFCs greatly reduced in the United States after scientific discovery revealed the unfriendly nature of these CFCs to the ozone layer. The book goes further to unveil the importance of the ozone layer for our planet. Furthermore, the negative consequences of high UV radiations from the sun on the planet is made known. My work greatly benefited from the causes and consequences of ozone layer destruction as revealed by this book.[30] This study however makes no mention of the Montreal protocol and focuses on ozone layer protection in the United States whereas mine studies ozone layer protection in Cameroon in respect to the Montreal protocol.

Another study reviewed by this work is titled "Engaging Countries: Strengthening compliance with international environmental Accords" by Edith Brown and Harold Karan. According to the authors, treaties are a good way of addressing global environmental problems. However, after states ratify these international treaties, no one really knows what is done by these states to implement these treaties. This study therefore studies how states implement and comply with international environmental accords. In respect to ozone layer depletion, the book also shows the responsibility of Cameroon in the destruction of this natural resources. This is done according to the authors through the manufacturing and importations of CFCs into the country.[31] These processes culminates to the emission of CFCs into the atmosphere, leading to ozone layer destruction. The role played by Cameroon in ozone layer destruction as revealed by this book was beneficial to my work. One would have normally expected to see the step by step implementation of the Vienna convention or Montreal protocol on ozone layer protection

[30] USEPA, *Protection of the Ozone layer*, Washington D.C, USEPA, 2016, PP.1-4.
[31] B. Edith et al, *Engaging Countries: Strengthening compliance with international environmental Accords*, Cambridge, MIT press, 2000, pp.435-441.

in Cameroon. That is not the case and in addition, the book studies the ozone layer problem in the Cameroonian context in a limited perspective and sketchy way. My work clearly reveals actions taken by Cameroon in application of the Montreal protocol.

As can be seen, other interesting works do exist which have a direct or indirect connection with the ozone layer or wetlands. They all have specific problems for which they were designed to solve. My study differs from all these works in that, it fundamentally seeks to unveil the contributions of the Montreal protocol and Ramsar convention to Ozone layer and wetland protection and management in Cameroon. In a global sense, it seeks to understand the contributions of international environmental laws to environmental management in Cameroon taking the Montreal protocol and Ramsar convention as case studies. It further identifies the limits observed with the implementation of these two IELs and proposing solutions to remedy these problems.

Objectives of Study

The objective of this work is to establish the contributions of the Montreal protocol and the Ramsar convention to ozone layer and wetland management in Cameroon. These major objective shall be guided by the following secondary objectives:

-To clearly show the benefits of the ozone layer and wetlands to both man and the environment.
-To find out how the Montreal protocol was implemented in Cameroon.

-To also find out how the Ramsar convention was implemented in Cameroon.

-Finally, to bring out weaknesses observed in the implementation of these two environmental laws and propose the way forward.

Conceptual Consideration

Before 1968, environmental problems were not part of the international agenda. As a matter of fact, even after the creation of the UNO and during the early years which followed its creation, environmental issues had no place in international discussions.[32] A revolution only came in 1968 when the UNO, thanks to scientific findings on the environmental, decided to include environmental problems into international discussions. Since the rise into prominence of environmental issues, different tools have been adopted to mitigate these problems among

[32] J. Peter, From Stockholm to Kyoto: a brief history of climate change, paper retrieved from https://www.un.org consulted on 11/01/2022 at 03:05pm, p.1.

which the ratification of environmental conventions occupy a good place. A handful of these conventions have been ratified by Cameroon both at the continental and global levels which include the Montreal protocol and Ramsar convention. For a better understanding of the issues developed this work, we shall define the following terms: ozone layer, wetlands, convention, protocol and environmental management.

Ozone Layer

Parson conceives the ozone layer as a layer of the earth located between 8 to 15 miles above the earth surface, in the stratosphere, which prevents high UV radiations from reaching the earth.[33] Wuebbles defines the ozone layer as the part of the upper atmosphere (15-35 km) above earth surface containing relatively high concentrations of ozone. It protects life on earth by screening out UV radiations from sun light. From the mid to late 1970s, scientists expressed worries about the ozone layer depleting due to CFCs as earlier mentioned. In 1974, chemists Mario Molina and Frank Sherwood Rowland discovered the link which exist between CFCs and the depletion of the stratospheric ozone layer. During this period, just little was known about the effects of an increase in UV radiations from the sun, on all life forms on earth. Despite this, some of its negative impacts on human health and the environment had already been identified. In the context of this work, the ozone layer shall simply be understood to be the concentration of ozone found in the stratosphere between 15-35km above earth`s surface which shields the earth from dangerous UV radiations from the sun.

Wetlands

According to Mitsch, wetlands are shallow to intermittently flooded ecosystems which are commonly known by terms like swamps, bogs, marches and sedge meadows.[34] Didem on his part, conceives wetlands as transitional areas between aquatic and terrestrial ecosystems.[35] Wetlands are strategic and play vital roles for the environment and man. They clean and retain water naturally, prevent floods, provide habitat and food for many plant and animal species etc. The greatest threats to wetlands in Cameroon are reclamation, over exploitation and human developmental projects. Ignorance and poverty also play a role in wetland destruction in Cameroon which cannot be belittled. Wetlands in Cameroon are divided into national wetlands and international wetlands, this work takes into consideration both

[33] E. Parson, *Protecting the ozone layer: science and strategy*, Oxford, Oxford university press, 2003, p.3.
[34] W. Mitsch, *Wetland creation, restoration and conservation: the state of science*, New York, Newnes, 2005, p.243.
[35] D. Gokce, *Introductory Chapter: Wetland Importance and Management,* London, Intechopen, 2018, p.2.

categories. In the context of this work, wetlands should be understood as areas where water covers the soils, or is present near the surface of the soil throughout the year or at certain periods of the year.

Protocol

A protocol can be understood as an international agreement which amends or modifies a convention. Remember that the Montreal protocol was a modification of the Vienna convention on ozone layer protection. This further explains why people often consider protocols to be subsidiaries of conventions. In 1985, large decreases of stratospheric ozone levels in the Antarctic stations of Hally and Faraday was discovered by Joe Farman, Brian Gardiner and Jonathan Shanklin. Research further revealed that anthropogenic factors were the main drivers of this phenomenon. This discovery culminated to the establishment of one of the most successful environmental treaty, the Vienna convention. Though its positive effects cannot be underestimated, the Vienna convention still had some serious weaknesses which were corrected by the Montreal protocol. Authors like Gilbert Monod de Froideville and Mark Verheul conceive protocols as agreements between states that amend treaties. Still based on their reasoning, a protocol is composed of rules which describe how something should be done, particularly in the field of diplomatic relations.[36] According to Jessica Whittemore, the word protocol means different things depending on the context under which the word is used. In international politics, she defines a protocol as an international pledge in which countries agree to act in a particular way.[37] In the context of this work, a protocol is an accepted modification to a convention by all parties or by a greater number of parties to the convention.

Convention

Conventions are pacts or agreements which are used to address issues with global implications. An example of such a convention is the Ramsar convention.[38] Gunter Hoog and Angela Steinmetz define a convention as an agreement between subjects of international law, which is subordinate to it. Conventions establish rules which countries accept to respect.[39] To

[36] G.M. Froideville et al, *An expert`s guide to international protocol : Best practices in diplomatic and corporate relations*, Amsterdam, Amsterdam University Press, 2016, p.3.
[37] J. Whittemore, International protocols in global politics, paper retrieved from https://www.study.com consulted on 13/12/2022 at 12:37pm.
[38] B. Lepage, *Wetlands: integrating multidisciplinary concepts*, Berlin, springer science & business media, 2011, p.13.
[39] G. Hoog et al, *International conventions on protection of humanity and environment*, Berlin, Walter de Gruyter, 1993, p.9.

other authors like David Lewis, conventions are simply agreements between parties.[40] The major objective of the Ramsar convention was to halt the loss of global wetlands due to factors such as ignorance and infrastructural development and to ensure their conservation. In other to achieve these objectives, the Ramsar convention places general obligations on its member countries, relating to the conservation of wetlands found within their national boundaries. The convention also include special obligations in relation to wetlands included in the list of wetlands of international importance.[41] In the context of this work, a convention should be understood as a set of unanimously accepted laws by states which govern their actions in a particular field of activity.

Environmental Management

Kumar defines environmental management as the organizational structure, responsibilities sequences, processes and preconditions for the implementation of an environmental corporate policy.[42] Ruppel and Yogo consider environmental management in the context of Cameroon as all the operations geared towards the improvement and preservation of the state of the environment both in its natural resources in general and ecosystems as well as how to interact with the environment rationally in other to achieve human wellbeing as highlighted in article 2 of the 1996 law.[43] Environmental problems gained steam in Cameroon in the 1990s. This was followed by efforts in the country to manage the environment in a sustainable manner. Nevertheless, this work conceives environmental management as the management of the relationship and impacts of human activities on the surrounding natural environment. It makes attempts to provide human needs while protecting the environment simultaneously.

Scope and Delimitation

This study is delimited in space and time. Geographically, Cameroon is the country concerned by this study. The country is bordered by Nigeria to the northwest, the Central African Republic to the east, Chad to the northeast, Gabon and Equatorial Guinea to the south, the Republic of Congo to the southeast and the Atlantic Ocean to the southwest. However, due

[40] D. Lewis, *Convention: A philosophical study*, Hoboken, John Wiley and Sons, 2013, p.1.
[41] US department of the interior, fish and wildlife services, *Wetlands of international importance: United States participation in the Ramsar convention*, Washington D.C, USDIFWS, 2009, p.2.
[42] P. Kumar, "An Introduction to the Concept of Environmental Management: Indian Context*", International Journal of Innovation and Economic Development*, VOL 2, October 2016, p.4.
[43] O.Ruppel et al, Environmental law and policy in Cameroon towards making Africa the tree of life, Baden-Baden, KAS, 2018, p.246.

to the country`s position, there exist a debate on if the country is West African or central African. According to popular opinion, the Western part of the country is in West Africa while the eastern part is in central Africa. Despite these different views on the matter, Cameroon is officially recognized as a central African country.[44]

The country`s name was derived from "Rio Dos Camaroes" (River of prawns), a name given to the Wouri River by Portuguese explorers in the 15th and 16th centuries. The country covers a surface area of 475 442 km^2. The city of Yaounde is its political capital while the coastal city of Douala stands as its economic back-bone. Cameroon is also known for its ethnic diversity due to it's over 250 ethnic groups. Some of its major ethnic groups include: the Bamileke, the Beti-Pahuin, the Duala people, the Kirdi, Fulani and sahelian Muslims etc. Cameroon is divided into five major relief regions marked by varying physical, climatic and vegetation features. It should be noted this work covers the whole of Cameroon in respect to the ozone layer. In the case of wetlands, it focuses more on wetlands found in the coastal, central, littoral and far north regions.

When it comes to the historical delimitation of this work, it spans from 1989. Written[45] and oral sources hold 1989 as the year in which Cameroon ratified the Montreal protocol on substances that deplete the ozone layer.[46] Indeed, this was a major event in the environmental history of the country. Cameroon alongside other countries ratified the Montreal protocol, marking the genesis of the global fight to phase out substances depleting the ozone layer. This study ends in 2021 which is historically marked by another major event in the environmental history of Cameroon, the ratification of the Kigali amendment.[47] The latter happens to be the last and most recent amendment of the Montreal protocol. This was significant in that, it was in line with the international efforts of Cameroon to protect the ozone layer. Also, this resulted to the conception and implementation of projects geared towards eliminating HCFCs and reinforcing the protection of the atmosphere.

The successes recorded by the Montreal protocol led to the aggravation of another environmental problem known as global warming.[48] This is so because, in an effort to replace

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[44] Njoko Chestel, 33 years, geography teacher, Yaounde (Cité Des Nations), 09 January 2022.
[45] See R. Mitchell, Multilateral Environmental Agreements to which Cameroon has taken membership actions.
[46] Tchoffo Benjamin, about 63 years, executive director of Yaounde environmental cabinet, Yaounde (Total Melen), 19 December 2021.
[47] Law N^0 2019/011 of 19 July 2019 authorizing the president of the republic to ratify the Kigali amendment to the Montreal protocol on substances that deplete the ozone layer.
[48] N.Seo, *Natural and Man-Made Catastrophes: Theories, economics and policy designs*, Hoboken, John Wiley & Sons, 2019, p. 202.

CFCs in response to the Montreal protocol, chemical companies switched to HFCs and HCFCs which happen to be global warming gases. The need to address this problem resulted in the Kigali amendment. Following this event, the Cameroonian parliament through law N^0 2019/011 of July 2019 authorized the President of the Republic to ratify the Kigali amendment adopted in Kigali on 16 October 2016. Due to this, Cameroon ratified the Kigali amendment on the 24th of August 2021.

Statement of Problem

Among the numerous environmental problems faced by Cameroon futures ozone layer depletion. The ozone layer is a layer of the earth`s atmosphere which absorbs 97-99% of the sun`s medium-frequency ultraviolet light. Without this layer of gas, all life on earth will be destroyed. [49]However, the benefits of this natural resource has not stopped Cameroonians from carelessly releasing ODS into the atmosphere which leads to the depletion of this precious natural resource. This is not a problem which should be belittled because it is a threat to all life forms on earth.

Wetlands make up over 70% of Cameroon and happen to be a natural resource with high value. Cameroonians depend on wetlands for fish, medicines, water, meat, wood for heating and vegetable cultivation amongst others. The benefits of wetland to the environment cannot also be belittled considering the fact that aside other benefits, they acts as carbon sinks, thereby mitigating another serious environmental problem, climate change. Despite these remarkable benefits, Cameroonian wetlands are fast being destroyed. It is spectacular to observe the manner in which Cameroonians have invaded this fragile ecosystems, greatly contributing to the loss of these ecosystems. [50]Pollution, ecologically unfriendly agricultural practices,[51] overexploitation, ignorance and urbanization occupy the top positions in the list of anthropogenic factors which account for wetland loss in Cameroon.

This explains why the government of Cameroon ratified the Montreal protocol on substances that deplete the ozone layer in 1989 and the Ramsar convention on wetlands

[49] Report of the 33rd edition of the international day for the preservation of the ozone layer, September 2020, p.1.
[50] F. Orock et al, "Wetland utilization and environmental implications on the north and southern slopes of mouth Cameroon, *Journal of agricultural science*, Vol 7, June 2015, p.103.
[51] Lonkeng Jackson, 41 years, Wetland farmer, Shell obili, 11 January 2022.

protection in 2006. Many actions have been taken so far in respect of the demands of these international environmental laws to address these environmental problems.[52]

This motivated the researcher to investigate the relationship between these two environmental treaties and actions taken so far in Cameroon in view of ozone layer and wetland protection. This will help understand their contributions to environmental management in the country, limits in respect to their implementation and solutions to overcome them. From the foregoing, we were instigated to pose the following research question which is to know, how did the Montreal protocol and the Ramsar convention influence the fight for ozone layer and wetland protection respectively, in Cameroon? This was guided by the following questions:
-What are the benefits of the ozone layer and wetlands to both man and the environment?

-How was the Montreal protocol implemented in Cameroon?

-How was the Ramsar convention implemented in Cameroon?

-What were some shortcomings of the implementation of these two international environmental laws in Cameroon and what are the remedies?

From the above, this work will be based on the following hypothesis which include:

-The government of Cameroon has taken measures aimed at effectively implementing the Montreal protocol and Ramsar Convention in Cameroon.

-Despite this, certain factors make the effective implementation of these IELs impossible up till now.

Sources and Methodology

In other to successfully carry out this study, data was obtained from both primary and secondary sources. Primary sources used in the development of this work were composed of oral interviews and archival data gotten from MINEPDED. This archival data constituted a rich source of information for this study. Aside archival data, oral interviews were conducted using two methods. The first method consisted of using questionnaires as a technique of obtaining oral data. The second method employed in the collection of oral data consisted of face-to-face interview technique. This method turned out to be very friendly and fruitful. The targeted population for the oral interviews consisted of front line actors in the fight for ozone layer and

[52] Ngale Meende Alfred, about 48 years old, Divisional officer of Kumba III sub division, Mambanda, 29 December 2021.

wetland protection, wetland inhabitants and people who`s activities had a connection with either the ozone layer or wetlands such as refrigerator technicians and wetland farmers. Secondary sources were also exploited for the development of this study as a compliment to primary data.

The secondary sources I exploited consisted of both published and unpublished documents. Talking of published documents, this study made use of books and articles in journals. Unpublished documents exploited for use in this study include: dissertations, theses and reports. This secondary sources which played a fundamental role in the development of this study were obtained from various research centers.

These research centers include: Institut Française du Cameroun (IFC), ministry of forestry and wildlife, International Relations Institute of Cameroon (IRIC), Faculty of Arts, Letters and Human sciences (commonly known by its French acronym FALSH) library of the University of Yaounde I, the ministry of the environment, nature protection and sustainable development and the Center for environmental data and environmental documentation. The internet was indispensable in the development of this study. Looking at the fact that environmental issues are presently at the heart of national and international political talks, the internet provided me with recent information in relation to ozone layer depletion and wetland loss as well as some of its causes and impacts. All information gotten from the above sources were documented following a critical and chronological approach.

As far as the methodology employed in this study is concerned, quantitative and qualitative approaches were used. This consisted of making use of the technique of questionnaires and also carrying out face-to-face interviews respectively. For the purpose of this study, I contacted inhabitants of wetland areas, administrators, heads of environmental institutions whom by virtue of their experience and professions had a good mastery of the issues examined in this study. Group interviews were not kept aside as they constituted a good means of clarifying doubts. While in the field, I began by making a brief introduction aimed at making sure that the informant clearly understood what my research was all about.

After this, I proceeded by posing a broad based question. The informant was allowed to say all what he/she knew about the subject of discussion while I without intervening, quickly recorded all the information revealed to me by the informant on a record book specially gotten for that purpose. In addition, I also made use of an audio recorder. When the informant was done, I asked more questions to clarify doubts. The quantitative approach served as a base for obtaining statistical data and a comparative analysis of popular opinion.

Difficulties Encountered

A work of this nature definitely could not be completed without meeting any difficulties. It's no secret that environmental considerations are recent in Cameroon. Finding books in relation to my subject of study in many libraries was a big problem. To solve the problem, I had to explore digital libraries where some really interesting books which were of great help to the development of this work were found. Many people at the frontline of the fight for ozone layer and wetlands protection, who possessed great knowledge of issues discussed in this work are either politicians or occupy high administrative positions.

Getting access to these personalities to obtain oral data was complicated. I however had the opportunity to talk with a few. To properly resolve this problem, I initiated talks with some actors in the private sector who provided me with valuable information necessary for my work. During research in the field, each informant had his or her own story to tell about the same subject. To solve this, I had to be very keen, critical and multiplied sources with aim to record only objective information. Some documents I came across were in the French language. Given my English background, I could not make use of them. This problem was solved with the use of computer technologies to translate this documents into English, permitting me to better exploit them.

Organization of Work

This work is composed of four chapters which do not include the general introduction and general conclusion. The general introduction was designed with the aim to help readers understand what the study is all about. Chapter 1 evokes the geographical setting as well as the physical environment of the territory under study. The second part of this chapter explain how environmental issues became a part of the political policies of the country. Chapter two analyzes the contribution of the Montreal protocol to Ozone layer management in Cameroon via its implementation. The third chapter on its part analyzes the contribution of the Ramsar convention to wetland management in Cameroon via its application. Through chapter 2 and 3, readers would be able to understand how these international environmental laws have each played a role according to their specific domains, in the efforts of the country to limit negative anthropogenic impacts on the environment. Chapter 4 brings to lamp light some weaknesses observed in the application of these IELs and proposes measures which could help the country achieve the effective application of the IELs concerned by this study. The general conclusion

recapitulates the main ideas analyzed in this study, propositions made and opens other axis of future research on this topic.

CHAPTER ONE

GEOGRAPHICAL SETTING AND HUMAN BACKGROUND OF STUDY

The relationship between man and the environment has evolved over time. In the past, both man and the environment lived in symbiosis, man has always depended on the natural environment for basic necessities such as food, water and other vital resources necessary for his survival and he freely obtained these necessities without disrupting the natural ecosystems of the earth. This harmony and mutual respect between man and the environment is today a story of the past. Human activities such as industry, agriculture and urbanization, has resulted in man becoming a threat to the survival of natural ecosystems and the services they provide.[1] The population of Cameroon just like that of other countries has for long now due to certain reasons interfered in the natural functioning of the environment without understanding the deep implications of their actions on their own survival. This chapter analysis among other issues, the physical environment of Cameroon, its wetlands and ODS situation. It also goes further to examine the genesis of environmental considerations in Cameroon and ends by revealing some early actions taken by Cameroon to tackle the problems faced by Cameroonian wetlands and the ozone layer.

1.1 Geographical Setting of Cameroon

This part of the work studies the physical features of Cameroon such as, relieve regions, vegetation and climate. It ends by looking at the situation of wetlands in the country and the ozone layer problem.

1.1.1. Location and Physical Environment

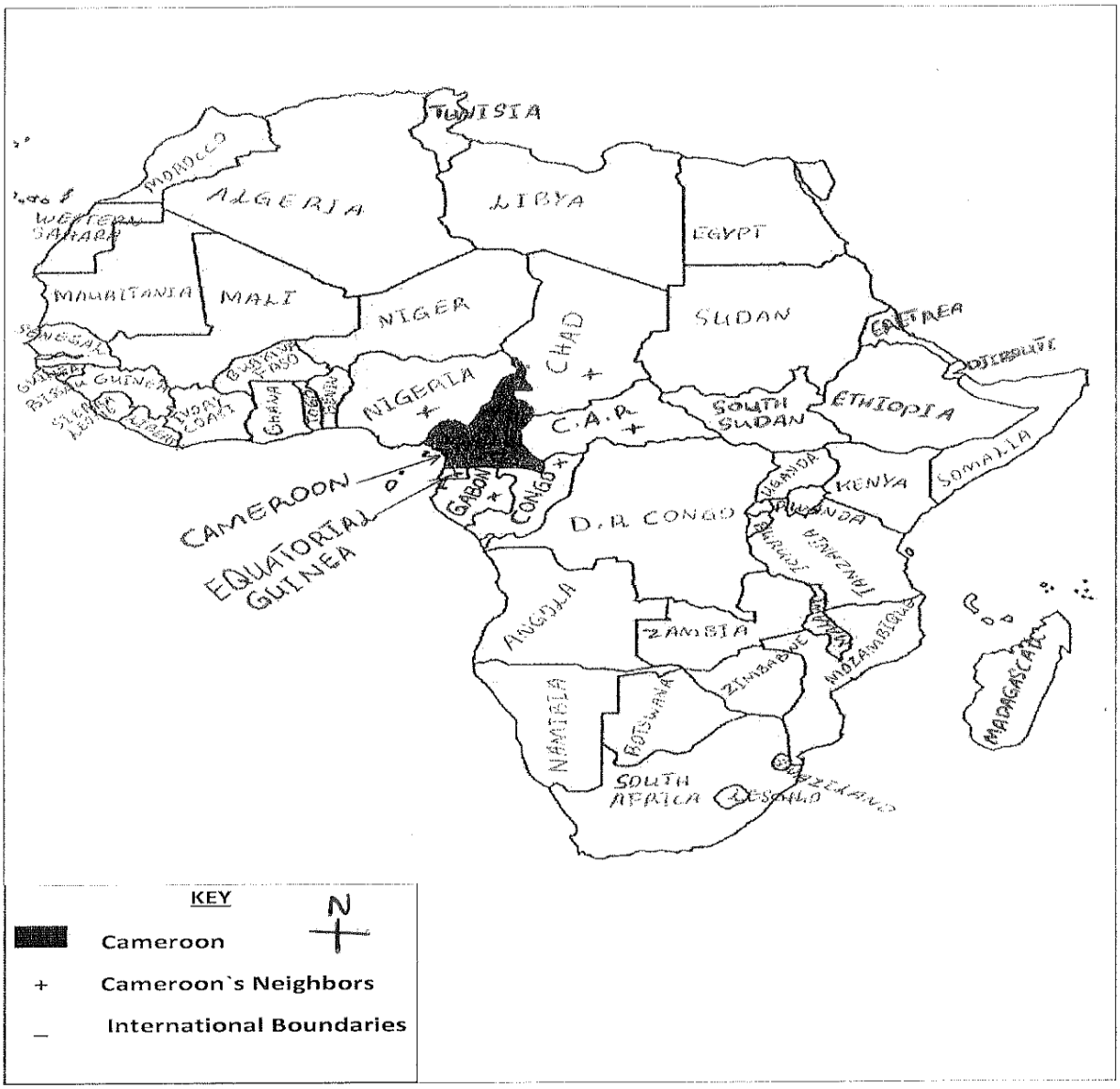
Cameroon is at the junction between central and West Africa, reason why the country is sometimes identified as West African and other times as central African. Its geographical situation explains its diverse relief, climate and population. Tourist literature describes Cameroon as "Africa in miniature".[2] The country has a surface area of 475 442 km^2 and lies between latitudes 1^o and 13^{o}N and longitudes 8^o and 17^{o}E, she is triangular in shape and is

[1] R. Klaus, *The Balance of Nature and Human impact*, Great claredon street, Cambridge University press, 2013, p.8.

[2] Cameroon is referred to as "Africa in miniature" because of its diverse landscapes that represents the continent's major climatic zones. Natural features such as white beaches, mountainous areas, tropical rainforests, savannah grasslands and sparse deserts can all be found in Cameroon.

actually the 53rd largest country in the world. Cameroon is bordered to the North West by Nigeria (1720 km boundary), in the north by Chad (1122 km boundary), in the east by the Central African Republic (822 km boundary), in the south by Congo (520 km boundary), Gabon (298 km boundary) and Equatorial Guinea (183 km boundary).[3] The country also has a boundary of 364 km with the Atlantic Ocean to the west of which she controls 12 nautical miles as can be seen on map 1 below

Map 1: The position of Cameroon in Africa



Source: Adapted from https://www.geology.com/world/africa-satallite-image.shtml

[3]A.Fouapon, "Islam et cooperation Arabo-Africaine: Cas du Cameroun et le Royaume D'Arabie Saoudite (1960-2010)" Mémoire de master en Histoire, Université de Yaoundé 1, 2011, p.7.

The lowest point of Cameroon is the Atlantic Ocean (0m), its highest point is mount Fako (mount Cameroon) 4,095m. The capital of Cameroon is Yaounde[4], a city set on an altitude of 750m and was born at the junction of the basin site between the Sanaga and the Nyong.[5] It is situated on 200 km of land and build upon seven hills, it is more relaxed than the economic and industrial capital, Douala. Cameroon is situated at a part of the world which is generally considered very hot, a glance at a climate chart will prove beyond doubts that this believe is just a myth. The climate of Cameroon varies with terrain, from tropical along the coast to the semi-arid and hot in the northern plains and Sahel region with a seven month dry season. The great variations in rainfall from one region to the next is astonishing.[6] The northern parts of the country barely has enough rain to support agriculture meanwhile areas such as the South West region records rainfall of over 500cm per annum and Debundscha near Limbe is the second wettest place in the world.[7]

1.1.1.1. Relief Regions

Cameroon is divided into five major geographic zones or relief regions distinguished by dominant physical, climatic and vegetation features. The coastal plain (also known as the coastal low lands) extends 15 to 150 km inland from the Gulf of Guinea. It is made up of Douala (the economic capital of Cameroon) and its environs. This zone experiences high rainfalls, temperatures, inhabits dense mangrove forest and includes some of the wettest places on earth.[8] It is also blessed with volcanic soils but also has ferralitic soils, hydromorphic soils and also contains water bodies like the Wouri and Sanaga rivers. This zone is the main industrial zone of Cameroon and one of the main wetland areas of the country.

The south Cameroon low plateau is also one of the five relief regions of Cameroon and is the second major geographic zone of the country. It rises from the coastal plain to an average elevation of 650 meters and equatorial rainforest dominate the area. This zone constitutes Yaounde (the political capital of the country) and its environs. It experiences high rainfalls of about 2000mm and temperatures range between 26 and 27 degree Celsius. It should however be noted that temperatures and precipitation in this zone are lower than in the coastal plains.[9]

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[4] Yaounde is in the list of cities with seven hills like Rome, Lisbon, Pretoria, Paris etc. These seven hills include: Mbog Ndum, Akok Noue, Minloa, Messa, Ebaminala, Fébé and Mbankolo.
[5] V.Lekeaka, "Insecurity in Business ventures in the City of Yaounde (1987-2016): A Historical Perspective", a Dissertation in history, University of Yaounde I, 2019, p 27.
[6] B.West, *Cameroon*, Buckinghamshire, Bradt travel Guides, 2008, p.7.
[7] *Ibid*. p.11.
[8] *Ibid.*
[9] Vakunta Sidonie, 37 years, Geography teacher, Yaounde (Ngousso), 05 October 2021.

The south Cameroon low plateau has four seasons, two wet and two dry seasons. Soils here are ferralitic, this zone is bordered to the north by the Adamawa plateau, to the east by the Central African Republic, to the south by Gabon and Congo and to the west by the coastal low lands. It is made up of many wetland areas such as the mangroves forest of Mbega.

The western highlands of Cameroon comprises the west, North West and a small part of South West. It is also referred to sometimes as the Western high plateau or Bamenda Grass fields. The equatorial climate is the dominant climate in this zone, both rainfall and temperatures are low (1500mm for rainfall and 20^{o}c for temperature). The region borders the south Cameroon plateau to the South east, the Adamawa plateau to the north east and the Cameroon coastal low lands to the south. This region is the 3rd major geographical region of Cameroon and the 4th industrial region of the country. Its soils are volcanic, alluvial and ferralitic, it has major mountains like mount Oku, Bamboutus and Manenguba. The western high plateau once had forest but due to repeated cutting and burning by humans, forest are now found only along water ways and grasslands have expanded into the region, raffia palms grow in the wet valleys and depressions.[10] It inhabits many wetlands such as those found along Bafousam-Bamenda road axis and the Ndop flood plain, a wetland area exploited for rice cultivation by the local populations.

The Adamawa plateau is located at the central part of the north and is the main water shed of the country, it has ferralitic soils, temperature and precipitation are low (900mm and 21^{o}c for precipitation and temperature respectively), the zone is sparsely populated and cattle raising is the main occupation in the area.[11] Its wetland areas, including the wet valleys ensure the availability of water and fresh grass for the cattle. The last geographical zone of Cameroon is the northern low lands. It is bordered to the east by River Logone to the west by the Mandara Mountain, to the north by Lake Chad and to the south by the Adamawa plateau. The Lake Chad basin is a wetland area in which many Cameroonians carry out fishing. Population concentration in this region is low. This area inhabits the Waza-Logon floodplain which happens to be the first wetland area in the country designated on March 20, 2006 to be included in the list of wetlands in international importance.

[10] *Idem.*
[11] *Idem.*

1.1.1.2. Vegetation

The combination of different temperatures and rainfall produces two major types of vegetation in Cameroon: equatorial forest and tropical grassland.[12] Mangrove trees encore themselves in swampy water by means of long spreading roots and reveal their architecture when the tides are out and their complex root system is exposed on the mud banks, the hard wood rain forest consist of mahogany, ebony, sapelli (or sapelle), iroco and obeche trees. The obeche or African white wood is a large deciduous forest tree that commonly grows up to 200 feet (61m). Due to the cash value of the hard wood, the rain forest has been heavily logged. Moving inland from the coast, annual rainfall decreases and the forest thins out. A mixture of forest and grassland gives way to savanna where trees and bushes are few.

Acacia and baobab survive here because they can shed their leaves thereby prolonging their ability to survive dry periods. There are a few hundred species of acacia trees in Cameroon and one of them known as Acacia catecu produces the dye which was the original source of khaki coloring. The large and impressive looking baobab tree is distinguished by its massive trunk. A rich variety of grasses grows in Cameroon`s savanna belt with the tallest of them being around 2m in height.[13]

The variety in vegetation plus regional factors such as the presence of rich volcanic soils around mount Cameroon and other parts of the western high lands explains the diverse agricultural potential of the country. Rain forest and mangrove swamps are found near the coast. A part of the population in this area make a living by exploiting resources found on this wetland area. Wetland vegetation serves as a source of food and medicine. Some wetland vegetation types like mangrove trees are used by the population for fish smoking and for the making of art objects (although this is not encouraged).

1.1.1.3.Climate

When it comes to climate, studies carried out by the World Bank shows that Cameroon has one main rainy season that last from May to November when the West African monsoon wind brings moist air over the country from the Atlantic Ocean. The peak rainy months correspond with the lowest average temperatures of the year, the southern plateaus experiences

[12] The equatorial forest also known as the Congolian coastal forest is a tropical moist broad leaf forest of central African covering hills, plains and mountains of the Atlantic coast of Cameroon and other countries like Gabon, Republic of Congo, Angola etc while tropical grasslands also known as savanna occupy the western highlands of Cameroon inhabited by the Bamilike, Bamum and the Bamenda Tikar.
[13] S.Sheehan et al, *Cameroon*, New York, Cavendish Square Publishing, 2019, pp.16-17.

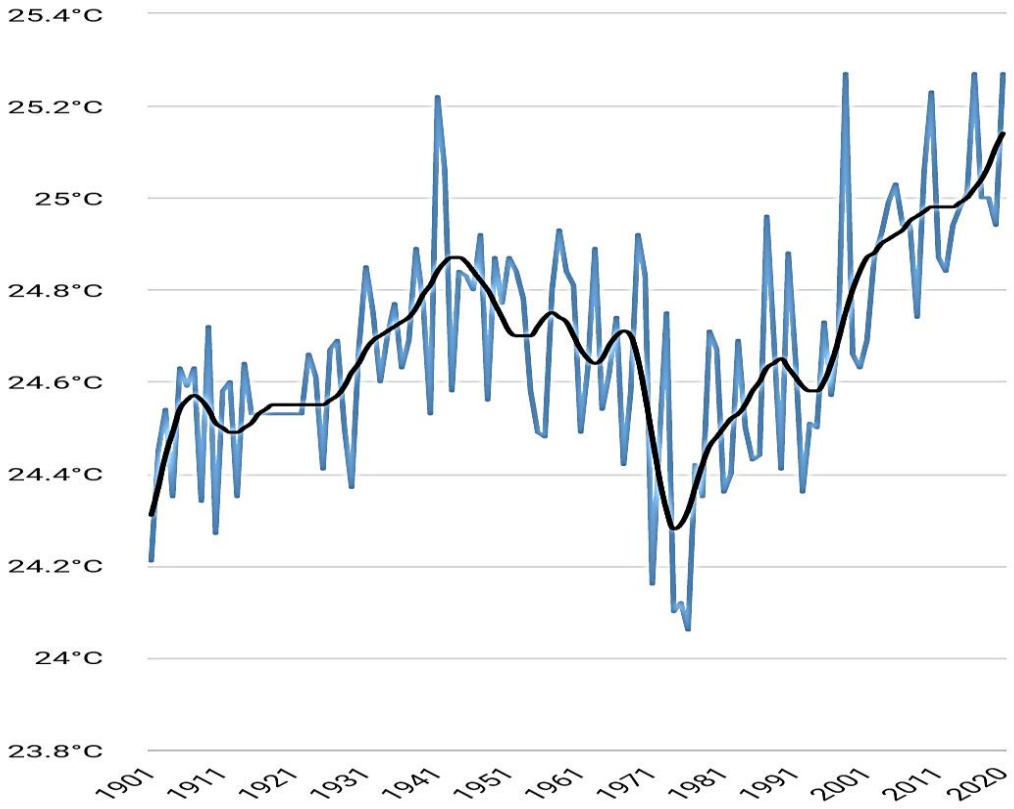
two shorter rainy seasons from May to June and from October to November. Cameroon`s dry season last from December to April and corresponds with the highest average temperatures of the year. The southern part of the country is humid and equatorial with temperatures ranging from 20-25^{o}c and the wettest regions receiving more than 400 mm of rainfall per month. Northern Cameroon is semi-arid and dry with temperatures ranging from 25^{o}c to 30^{o}c, this portion of the country receives less than 100 mm of rainfall per month. In a general perspective, average temperatures have been on the rise in Cameroon (see graph 1).

The average annual precipitation in Cameroon has however reduced by 2.9 mm per decade since 1960. A number of meteorological stations opened in Bamenda, Banyo, Bertoua, Douala, Garoua, Meiganga, poli and Yabassi have captured decreasing trends in rainy season precipitation in the West, South West, and northern regions of Cameroon from 1951 to 2000. Wetland ecosystems are very fragile and sensitive ecosystems. Their survival also depends on a combination of other environmental factors such as temperatures and precipitation.[14]

The climatic condition of the country also greatly favors the development and preservation of wetland ecosystems. This also explains why the country counts so many wetlands of national importance. Some of these wetlands are permanent while others are seasonal. It should however be noted that a disequilibrium between this different environmental factors which favors the existence of wetland ecosystems in the country, could negatively impact them.

[14] *Ibid.*

Graph 1: Observed average annual temperature in Cameroon from 1901 to 2020



Source: https://www.climateknowladgeportal.worldbank.org/country/cameroon

As the graph above clearly reveals, average annual temperatures have been increasing in Cameroon since 1901. New findings show that temperatures have risen the more rapidly during March and May at a rate of 0.19^{o}c per decade all over Cameroon.[15] The northern part of the country has seen the most rapid rise in temperatures from December to February and from September to November at rates of 0.2^{o}c to 0.4^{o}c per decade. From the above analyses on the physical environment of Cameroon, it is comprehensible why Cameroon is also sometimes referred to as "Africa in microcosm".[16]

1.1.2. The Ozone Layer Problem

The ozone layer which is sometimes also called Ozonosphere refers to a region of the upper atmosphere found between 15km and 35km above the earth`s surface which contains a relatively high concentration of ozone molecules (O_3). To better understand the ozone layer

[15] *Ibid.*
[16] B.West, *Cameroon*, Vol 3, Buckinghamshire, Bradt travel Guides, 2008, p.1.

and its location, it will be important for us to first recapitulate the constituents of the earth's atmosphere. The earth's atmosphere is divided into four distinct layers.

Firstly, we have the layer of the atmosphere known as the troposphere. This actually is the first layer of the earth`s atmosphere, it is characterized by a decrease in temperature with increase in height. Around the equatorial regions, this layer extends up to 17km above the earth's surface and its upper limit is referred to as the tropopause. Above the troposphere lies the second layer of the atmosphere known as the stratosphere. This regions extends up to 50km of altitude and characterized by an increase in temperature with increase in height and this is simply explained by the fact that this region of the atmosphere contains 90% of the earth`s ozone layer, a gas which has a high capacity to absorb sunlight.[17]

The ozone layer is principally found in the stratosphere within 10-50 km range in altitude and this is the area earlier referred to as the ozonosphere, some authors refer to it as the good zone.[18] Directly above this layer lies the mesosphere which extends from 50-85 km and characterized by decrease in temperature with increase in height, its upper limit is known as the mesopause. Beyond the mesopause lies the last layer of the atmosphere referred to as the thermosphere characterized by an increase in temperature with increase in altitude.

The year 1770 has stood out in scientific history as the year characterized by research in order to discover the composition of our earth`s atmosphere. It was during the 1770s that many of the earth`s constituents were discovered and named. It was under this context that hydrogen chloride was discovered in 1773 and in 1774, J. Priestley and C.W. Scheele discovered oxygen. Scientific history credits the discovery of the ozone gas to a German scientist called Christian Friendrich Schonbein. This discovery was made in 1839 while he was working in his laboratory and he named it ozone.[19] After the discovery of the ozone gas, another major scientific discovery came in 1913 when French physicists Charles Fabry and Henri Buisson discovered what is today known as the ozone layer.

If there exist today an international environmental treaty protecting the ozone layer, it is because of the role the ozone layer plays in maintaining life on earth. The ozone layer is so important because it protects the earth from dangerous ultraviolet (UV) light or radiation by

[17] *Ibid.*
[18] M.Arjun et al, *Mending the Ozone Hole*, London, The MIT Press, 2014, p.5.
[19] Ozone is a colourless or pale blue gas which is highly reactive and is composed of three oxygen atoms, it occurs naturally but can also be made by man, it is found both in the earth`s upper atmosphere and ground level.

absorbing it. This therefore means that it is an inevitable compound to save life on earth.[20] It is certain today that without the ozone layer, there will exist no life on earth. The weakening of the ozone layer which acts as a shield over the earth had the capacity to lead to an increase in UV radiations reaching the earth, resulting to an increase in the chances of getting skin cancer, eye cataracts, immune deficiency disorders, sun burn on both humans and animals and death of phytoplankton resulting to a decrease in fish productivity.[21] According to scientists, the earth`s fauna and flora will not be able to support this high UV radiations coming from the sun. It was predicted that global warming will increase alongside its consequences due to increase UV radiations. It was also predicted that the earth`s ecosystems will disappear alongside the important services they provided.

Despite the fact that life on earth depends on the ability of the ozone layer to absorb UV radiations from the sun, this layer was for long being destroyed due to the unsustainable use of the atmosphere by man, notably through the release of ozone depleting substances into the atmosphere. Both developed and developing countries in one way or another contributed to ozone layer destruction through the release of dangerous gases into the atmosphere which are harmful to the ozone layer, though the amount of ODS released varies from one country to another. As earlier seen, it was in the 1970s that scientists expressed worries and simultaneously warned that humans were destroying the ozone layer due to the release of CFCs into the atmosphere. This is what prompted a UNO organ known as UNEP to take action in 1977 by organizing a conference aimed at producing a global action plan which could address problems related to ozone layer depletion. A series of negotiations culminated to the Vienna convention on the protection of the ozone layer and then, the Montreal protocol in 1987.

Cameroon just like many other countries was not exempted from the release of ODS into the atmosphere and hence, ozone layer destruction. Most of the ODS found in Cameroon were produced in developed countries like the People`s Republic of China and these products or substances containing them entered developing countries like Cameroon through imports.[22] This makes it clear that, Cameroon can also be held accountable for ozone layer depletion mainly because of its importation and consumption of ODS or products containing them, a process during which ODS was released into the atmosphere.[23] Some examples of ODS include

[20] D.Jan et al, *Ozone in Nature and Practice*, Nordestedt, BOD, 2018, p.12.
[21] USEPA, *Protection of the Ozone layer*, Washington D.C, USEPA, 2016, PP.1-4.
[22] Njuemjo Dimitrie , 41 years, refrigerator technician, Douala (Deido), 26 October 2021.
[23] B. Edith et al, *Engaging Countries: Strengthening compliance with international environmental Accords*, Cambridge, MIT press, 2000, pp.435-441.

chlorofluorocarbons, hydrochlorofluorocarbons, dichlorodifluoromethane, chlorobromomethane, methyl bromide, carbon tetrachloride, methyl chloroform etc.

One thing we notice immediately by looking at the above mentioned ozone depleting substances is the fact that a majority of them contain chlorine and fluorine gases which are very dangerous to the ozone layer. These products are used for the production of solvents for cleaning (this also includes dry cleaning solvents), foam blowing agents, refrigerants found in home refrigerators as well as those used for commercial purposes. Also, they are found in the air conditioners found in cars and buildings, industrial solvents, components of electrical equipment, fumigants and aerosol spray propellants. From the above, we see that ODS can be found in equipment like refrigerators, air conditioners, fire extinguishers and in substances like foam and aerosol propellants.[24]

Another thing we quickly notice is the fact that many of these equipment and substances if not all are highly consumed or used in Cameroon. Their careless use is what leads to ODS emissions into the atmosphere. When it comes to refrigerants containing ODS, Cameroon makes use of R600a and R134a (this have lesser impact on the ozone layer as compared to R12a which was highly destructive on the ozone layer) used in refrigerators, and besides this, We can also talk of R22a and R10a which are used in air conditioners.[25]

With all this, we see that there was indeed a need for Cameroon to join other nations in seeking durable solutions tilted towards the protection of the precious ozone layer. Information gathered in the field revealed that even though some refrigerator technicians were aware of the catastrophic consequences of CFCs presents in these refrigerants, they still continued to ignore this and did not take necessary precautions when manipulating them to prevent their escape into the atmosphere.[26]

1.1.3. Wetland Ecosystems

Wetlands are ecosystems saturated with water either seasonally or permanently. They store water and ensure its good quality, providing resilience against droughts, they also play a central role in sustainable development through the supply of fresh water. According to the Ramsar convention on the protection of wetlands especially as waterfowl habitats, wetlands include all lakes and rivers, underground aquifers, marches and swamps, wet grasslands, peat

[24] Atangana Gustave, 38 years, trader in electrical equipment, Douala (Deido), 28 October 2021.
[25] Djoko Wilfred, 45 years, refrigerator technician, Douala (Deido), 26 October 2021.
[26] Cabrel Gills, 33 years, refrigerator technician, Yaounde (Ngoa-Ekelle), 14 October 2021.

lands, oases, estuaries, deltas, tidal flats, mangroves and other coastal areas, coral reefs and all human made sides such as fish ponds, rice paddies, reservoirs and salt pans. Wetlands vary widely due to differences in soils, topography, climate, hydrology, water chemistry, vegetation, human influence and other factors. Wetlands are found in every continent of the world except in Antarctica. They are havens for some scares natural resources and migratory birds. They are the only ecosystems which have their own international convention designed to protect them from continuously being destroyed.

The history of wetland protection dates back to the 1960s when a group of bird scientists raised concerns about the global loss of wetlands which served as the habitat of migratory birds. This loss of migratory bird habitat according to these birth scientist was attributed to factors such as Urbanization and pollution. This soon turned into a movement which attracted global attention. With this discovery, there was the need to mobilize the international community and adopt durable solutions to halt the loss of this migratory bird habitat. It was under this context that Dr Luc Hoffmann, being a bird scientist himself, took it upon himself to seek a global solution to this problem. He initiated the idea of an international convention to protect migratory bird's habitat as early as 1960. Still in the year 1960, Dr Luc, in an effort to protect wetlands, decided to make a proposal to the IUCN. This proposal which was warmly welcomed by this organization, called for a global conservation and management of all wetlands.[27]

Furthermore, an international conference was organized by Dr Luc, attended by 12 European nations who were joined by representatives from Austria, Morocco, Canada and the United States. This conference laid the ground work of the future Ramsar convention on wetland protection. After this conference ended, it took over eight years of international conferences to finally arrive at the Ramsar convention on wetlands of international importance, especially as waterfowl habitat in 1971. The Ramsar convention happens to be the oldest multilateral international conservation convention.[28] Since the time this convention was arrived at, many countries have been called upon to ratify it, fortunately, global responses to this call were positive.

Cameroon inhabits wetlands such as the Barombi Mbo Crater Lake, the Rio Del Rey Estuary, River Ntem flood plain, River Sangha flood plain, Lake Chad region, the humid zone

[27] AWSG, "Short History of the Ramsar Convention on Wetlands of International Importance", *Journal for the east Asian-Australasian Flyway*, January 2021, pp.2-5.
[28] *Ibid.*

of Ebogo and the Waza-Logone flood plain, the Mboh and Santchou plain, Ndop flood plain, the Ndian creeks, the coast of limbe, Tiko, Douala, Edea, Lagdo, songloulou and maga.[29] Other smaller wetlands found in sub divisions in Cameroon are not being kept out. Tidal forest are well developed on the coast of Cameroon between the Cross River and the Wouri Estuary. In the coastal plain areas, freshwater swamps forest occur on several rivers and there are some shallow lakes and swampy depressions on the alluvial flats between the mouths of the Sanaga and Lokoundje Rivers.[30] There are several deep crater Lakes in the hills of the southwest, west and northwestern regions. Some of them contain endemic species of fish and others such as Lake Barombi Koto are important birth sanctuaries. In the far north, there are several small shallow semi-permanent Lakes in the floodplain areas and part of Lake Chad situated in Cameroon.

Most extensive wetlands in Cameroon are seasonal and are associated with river systems located in the interior. In the far north, almost the entire area between the Logone/Chari Rivers and the El Beid River is flooded seasonally and several permanent channels connect these rivers. Other extensive floodplains occur on the Faro, Benoue and Kebbi Rivers north of the Massif de *L`Adoumaoua* while to the south of this massif, there are forested floodplains on the Djerem, Lom, Pangar and upper Sanaga Rivers in the headwater basin of the Sanaga.[31] Permanent swamp forest and permanent and seasonally inundated grass swamps occur along the upper Nyong River and in the southeast, there are seasonally flooded forest and galleries in the Dja, Kadey and Boumba Rivers.

Cameroonian wetlands are so rich in plant species and these plant species varies according to the type of wetland area. Tidal wetlands in Cameroon are generally wetlands dominated by Rhizophora racemosa, Rhizophora harrisonii and Rhizophora mangle which are very common in upstream sites. Plant species which can be found in the wetland areas of the southwest region include Anthocleista vogelii, Avicennia Africana, Callophyllum inophyllum, Carapa procera, Conocarpus erecta, Cynometra mannii, Hibiscus tiliaceus etc. When it comes to wetland fauna in Cameroon, there are 179 species of fish in the Lake Chad basin. Alestes baremouse, Alestes datex,Clariaslazera, hydrocymus forskali, Tilapia zillii are among the fish

[29] S.S.kometa, "Urban Development and its Implications on Wetland Ecosystem Services in Ndop, Cameroon", *DGUB*, vol 7,2018, p.24.
[30] R.Hughes, A *Directory of African Wetlands*, Gland, IUCN, 1992, pp.457-462
[31] *Ibid.*

species found in the Lake Chad, Volta, Niger and Nile Basins including lake Alberta and Turkana.

Reptiles like crocodylus cataphractus and crocodylus niloticus can be found in Cameroonian wetlands. The country contains a rich variety of births because of the range of wetland habitats existing in it. The birds of the northern floodplains have many species in common with similar floodplains south of the equator. Such species include Coracias abyssinica, Ephippiorhynchus senegalensis, Merops bullock occur together with herons, weavers, egrets, warblens, duck and geese.

The above wetlands have numerous advantages to both Cameroonians and the environment which include the fact that they guarantee a good water quality, this is so because wetlands act as natural water purifiers. They filter sediments and also absorb many pollutants found in surface waters. In some wetland systems, this cleansing function also enhances the quality of ground water supplies. Another very important function of wetlands is the fact that they provide habitat for many species of amphibians, reptiles, mammals and birds which are uniquely adapted to aquatic environments (even dry land animals depend on wetlands in one way or another).[32] The Lake Chad basin supports thousands of mammals in addition to millions of waterfowls, many of them migratory during the year and this can be exploited for income generation.

Wetlands are also important for ecosystem productivity. Some wetland types are among the most reproductive ecosystems on earth and based on this fact, it is not surprising to realize that a stand of cord grass in a salt marsh can produce more plant material and store more energy per acre than any agricultural crop except sugar cane. In respect to recreational opportunities, wetlands contain a diversity of plants, animals and water features which provide beautiful places for sightseeing, fishing, hunting, boating, photography and birth watching.[33]

Many of the wetlands of the Sahel of Cameroon have been converted into intensive agriculture. If properly managed, natural wetland agriculture can yield substantial benefits to rural communities. West African rice, Orza glabberrina, was domesticated over 2000 years ago. Throughout the region, rice farmers had recognized the value of floodplains which are seasonally inundated by rivers, an example is the inner floodplains of the Logone where rice can still be grown traditionally and this rice cultivation is adapted to annual floods in the area.

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[32] *Ibid.*
[33] *Ibid.*

Most importantly, varieties which are able to withstand the rising waters are planted at particular moments of the year following flood heights. When it comes to biomass production, the wetlands of the Sahel region supports dense populations of vegetation on which fishes feed, including wildlife and various types of livestock graze. The human population living in and around such wetlands, directly benefit from the harvest of its forest resources such as fuel wood, timber and non-wood forest products such as gum, resin and medicines.[34]

Most plants gotten from wetlands such as Oryza longistaminata, Echinochhloa stagnina and water lilies serve as food to humans especially during drought and before millet and rice harvest in normal years. It`s necessary to make it known that no single wetland can provide all these advantages but each wetland provides some of these advantages. Despite all this, wetland ecosystem services are a necessity for many plant and animal species who exploit them or depend on them in different ways.[35] Wetlands are solicited natural resources as far as human subsistence and biodiversity conservation are concerned. Some artificial wetlands have also been created in Cameroon and being exploited for economic purposes.

This is the case with fish ponds created by the local populations and is either exploited for home use or for economic purposes. Among many other benefits of these wetlands is the fact that they serve as carbon sinks which means they absorb and store carbon dioxide thereby greatly contributing to climate change mitigation. Most families in Cameroon make a living just from exploiting wetland resources. Not taking into consideration the surrounding houses in plate 1 below, we see a wetland area in Obili being exploited for the cultivation of maize and cocoyams by the local population. This practice is encouraged by the richness of the soils and the presence of water even during dry seasons.

[34]C.S.Wanzie, "Wetland conservation and development in the Sahel of Cameroon", *archives-ouvertes.fr*, HAL-00137946, May 2007, pp. 3-4.
[35] E.W.Kongnso et al, "Mapping the evolution of urban wetland services in Nkolbissong, Yaounde, Cameroon, a remote sensing-gis approach", *Global Journal of Engineering Science and Research*, Vol 1,May 2020, p.4.

Plate 1: The Obili-Yaounde wetland area with part being used for agricultural purposes, 2021

Source: Author`s field photo, Yaounde-Obili, 04/10/2021

However, the problem of wetland loss touches even Cameroon. Despite the rich nature and advantages of wetlands found in the country, they have continuously been destroyed due to factors such as poverty.[36] Cameroonian wetlands have been invaded by poor people due to the fertility of this areas. They fish, harvest wood, clear it and use for farmlands etc. This places are havens for food to them. This pressure on wetlands resulted to their destruction and animals which inhabit this areas have been displaced. Such is the case with many wetlands in the center and western regions.

[36] Kempes Stephan, 51 years, assistant of cité des nations bloc head, Yaounde (Cité des nations), 09 October 2021.

Also, due to an increase in the population of coastal towns like Limbe, Douala, Kribi etc, coastal wetlands have been destroyed through reclamation or transformed into recreational centers.[37] Furthermore, ignorance of the population about the value of wetlands also contributed to their destruction.[38] Aside these anthropogenic factors which had been a threat to wetlands in Cameroon, some natural factors such as climate change also played a role to wetland destruction in the country. Coastal wetlands had been hit by climate change, this is simply explained by the fact that human activities in the area made it vulnerable. Rise of sea level unleashed floods which swept away wetland habitats, resulting to their destruction.[39]

1.2. Human Background of Study

This part of the studies shows how human migration and peopling in Cameroon was also associated with wetlands. It examines the origin of environmental considerations in the country and ends by presenting some early efforts taken by Cameroon in respect to ozone layer and wetland protection.

1.2.1. Migration and Peopling of Wetland Areas in Cameroon

Before opening discussions on the migration and peopling of the country today called Cameroon, It's important to first understand that before and during the 19th Century, there was no territory called Cameroon as is the case today. What was known of the country by European traders was just the coastal regions of the country. The Arabs present in the northern part of the African continent knew only the northern regions of the country today called Cameroon. It was only after the Berlin West African Conference that the boundaries of present Cameroon were arrived at.[40] This was as a result of separate agreements signed by the Germans with the British and the French. To the west, the boundaries of Cameroon were established through the signing of three accords with the British, each extending the boundaries of Cameroon from the Rio del Rey to the Lake Chad region. Franco-German accords established the southern, eastern and northern boundaries of Cameroon.

The history of Africa in general and that of Cameroon in particular had been marked by lots of migrations in various directions, caused by various factors. This causes could all be classified under Pull and Push factors. This event amongst others which were ongoing in

[37] Atabong Aloysius, 63 years, real estate business man, Kumba (Three corners), 28 August 2022.
[38] Ajong Ndia Cyprian, 46 years, real estate business man, Yaounde (école de post), 09 October 2021.
[39] F. Tazoacha, Managing wetland ecosystems to guarantee water security in Cameroon paper retrieved from https://www.ideasforpeace.org on 27/01/2022 at 07:31pm.
[40] V.J.Ngoh, *Cameroon History Since 1800*, Limbe, Presprint, 1995, p.1.

precolonial Africa proved that Africa had a history of its own. This idea contradicted the Roper-Hegel theory according to which, Africa was no historical part of the world. Their argument was based on the absence of written sources. History can`t be dissociated from man. If history had as object of study man, then where ever man had existed, there was certainly a history to talk about.

In the case of Cameroon, archeological findings in Shum Laka, northwest region, revealed that humans had inhabited this area about 30000 years ago. In the dense forest of southern Cameroon, the oldest evidence of human occupation was around 7000 years old. Also, archeological, oral and ancient Arabic sources revealed the existence of a civilization in the northern part of the country which existed as far as 700 BC and with time, Cameroon witnessed the immigration of many more people.

These new comers migrated and settled in different parts of the country and presently still occupy these areas. This normally evokes some questions such as, who were these people? Where did they come from? and where did they settle? A good understanding of the migration and peopling of Cameroon cannot be done without providing satisfactory answers to these questions. The general directions of migration in Cameroon were from the north to the south, east to west and south to center.[41] However, a greater part of migrations were from north to south. The corridors of emigration were rivers, forests and caravan trails.

1.2.1.1. The Pygmies

The Pygmies occupied the east and southern regions of Cameroon. They were the oldest inhabitants of the country. They could also be found in countries of the equatorial belt of Africa like Rwanda, Burundi, Central African Republic, Congo and Gabon. They were known to be a wondering people and lighter in color than their Bantu neighbors. They were people below average height, that is, about 1.5 meters for the men and women slightly shorter.[42] Reliable sources showed that there are presently over 7000 Pygmies in Cameroon. It was believed that the pygmies were direct descendants of Late Stone Age hunter-gatherer people of the central African rain forest. They always had a direct connection with natural ecosystems in their area like wetland ecosystems from which they depended on the plants for medicine and animal life for food.

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[41] *Ibid.*
[42] Frankline Joseph, 48 years, ecological activist, Total Melen, 13 November 2021.

1.2.1.2. The Sao

The first known Sudanese civilization to have been established in Cameroon was known as the Sao civilization. They settled along the banks of the Lake Chad region, one of the major wetland regions of the country. This region included present day Nigeria, Cameroon and Chad.[43] The occupation of this area by the Soa dated as far back as 700 BC. According to data gotten from oral traditions, it was believed the Sao people originated from the Middle East. Other sources contradicted this idea by claiming that the Sao people originated from the Nile Valley. Others believed that the Sao were the descendants of the Hyksos who conquered Egypt. Some scholars contradicted all the above ideas by arguing that the Sao originated from the Bilma Oasis north of Lake Chad.[44] This makes us understand that there is no unique generally accepted origin of the Sao people.

Scholars however agreed on the fact that the Sao were the first indigenous inhabitants of the Lake Chad basin and thus, first civilization to have existed in Cameroon. Artifacts prove that they were a sophisticated civilization working on bronze, copper, bronze sculptures, coins, funerary urns, household utensils, highly decorated pottery, terra cotta status of human and animal figures were discovered in the areas occupied by the Sao. Presently, many ethnic groups in the Lake Chad basin such as the Buduma, Gamergu, Kanembu, Kotokos and Musgum claim to be the descendants of the Sao. Among all these groups, research proved that the Kotokos were the direct descendants of the Sao people.[45] The sao lived along the banks of the Chari River, a wetland area which they exploited for agricultural purposes.

Just like in many sub-Saharan African countries, the Bantus were also present in Cameroon. The term Bantu referred to the populations established in the center, south and part of east Africa. It has always been believed by some people that the term Bantu referred to a group of Negro languages spoken in the continent. Bantu ment men or humans, this makes it clear that the term cannot refer to a group of languages alone but also, to a well identified group of people. The Bantus defined themselves as descendants of a divinity. From all the above, we should understand that the Bantus were a group of people who spoke inter-related languages and whose cultures were directly linked to each other. Take for example the word child which was translated omwana in Mpongwe (Gabon), mwana in Mbochi (Congo Brazzaville), mwon in Ekang (Fang-Beti Bulu), Man in Basaa (Cameroon), umwana in Kinyarwanda (Rwanda) etc.

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[43] J.Boulet et al, *Le nord du Cameroun: bilan de 10 ans de recherches*, Paris, ORSTOM, 1979, p.31.
[44] *Ibid.*
[45] Aminatu Hassatu, 50 years, wetland farmer/native of weh, Weh, 06 November 2021.

This example was taken just to show the inter-related nature of Bantu languages spoken by the Bantus.[46]

It's now clear that the term Bantu did not just make reference to a group of inter-related African Negro languages but also to a group of people with a history who had lived and evolved over space and time. When it comes to the origin of the Bantus, two schools of thought clearly distinguished themselves. The first school held that the Bantu originated in the area between present day Cameroon and Nigeria, which had been for very long their original zone of habitation according to Greenberg. It was believed that it`s from this area that the bantus migrated to other parts of the African continent, a process which took over four thousand years.[47] The second school of thought based on oral tradition held that the Bantu originated from ancient Egypt and the works of Cheik Anta Diop supported this idea. According to this school of thought, the Bantu migrated from the Nile valley to subequatorial Africa passing through West Africa.

Presently, the Bantu occupy the areas between Cameroon and Nigeria right down to Cape, in South Africa. From east to west, the Bantu span from the Indian to the Atlantic Ocean. In Cameroon, we have the bantu and semi-bantu, the bantu were composed of subgroups like the Douala, Bassa, Bakundu, Bulu-Fang, Log Mpo`o, Beti etc. Semi-bantu included the Tikar, Bameleke, Baya, Widekum, Kaka etc.

1.2.1.3. The Tikars

From the above, we note the presence of a Semi-Bantu group in Cameroon known as the Tikars. There was no single ethnic group called the Tikars, but tribes like the Kom, Bum, Nso, Ndu, Bafut and Bamum were of Tikar origin. The Bali were not of Tikar origin but rather, they were of Chamba descent. The Tikars migrated from the north of Cameroon because of Fulani raids and migrated down south into the western highlands which they still occupy till today. They spoke a Bantoid language called Tikar. Tribes of Tikar origin shared the same traditional dances, burial rights and marriage customs. There were similarities and differences in Tikar languages but this could not rule out their common origin.[48]

The political structure of Tikar kingdoms revealed well-structured institutions. The palace had always been the place of authority with its head being referred to as the Fon or

[46] A.R.Pegha, *Survivance de la culture égypto-nubienne ches les bantu: Essai sur les fondements pharaoniques de la renaissance Africain*, Yaoundé, L`Harmattan, 2019, pp.21-28.
[47] Assomo Sonia, 33 years, Researcher on forest ecosystems, Cradat, 10 November 2021.
[48] Che Elvis, 48 years, Farmer, Nkolbissong, 12 November 2021.

Foyn.[49] The Tikar were people very tied to their traditional believes or culture.[50] The western highlands in which they settled inhabits some important wetlands on which they depended for fishing. For a long time, they made use of the raffia palms which grew in the valleys for various purposes such as food, construction of huts and for palm wine tapping.

1.2.1.4. The Bamileke

The Bamileke were another major ethnic group established in Cameroon. They were made up of over a hundred fondoms. Most of the Bamileke people traced their origin to the Upper Mbam country from where they migrated down south to the western highlands. The Bamileke were Semi-bantu, although Thomas Tchatchoua, a Cameroonian scholar, believed they were much more related to the Bantu people in the south of Cameroon and culturally not different from them. He argued that linguistically, the words house, child and man had the same pronunciations in the Bamileke and Beti languages as Nda, Mon, and Mot respectively. According to him, such similarities could not exist without cultural and historical links.[51] The Bamileke didn`t see death as the end of life but as simply a transition from one stage of life to another. To the Bamileke, their leader called Fo was seen as a semi god.[52] They were established in the western highlands where they practiced some farming activities on the available wetlands areas. Studies showed that most of the Bamilekes settled along valleys due to the suitable nature of its soils for agriculture.

1.2.1.5. The Fang-Beti

Aside the above mentioned ethnic groups, we also had the Fang-Beti, another major ethnic group of Cameroon. They could also be found in Gabon, Equatorial Guinea and Sao Tomé and Principe.[53] They were of the Pahuin stock. Within the group, there were many dialects but they all had a common language. Sources revealed that the Pahuin migrated from the equatorial forest where they crossed the valley of the river Sanaga. Earlier believes were in favor of the fact that the Pahuin originated from the Azande area in Sudan.[54] Some scholars believed they originated and migrated from the Nile region to present day Cameroon in the

[49] Ngoh, *Cameroon History Since 1800*, 1995, p.7.
[50] Sih Christina, 54 years, farmer, Weh, 06 November 2021.
[51] T.Tchatchoua, *Les Bamiléké au Cameroun: Ostracisme et sous-développement*, Yaounde, Editions L`Harmattan, 2013, p.30.
[52] Zoneg Christian,53 years, trader in electronics, Yaounde (école de post), 13 November 2021.
[53] J.Shoup, *Ethnic Groups of Africa and the Middle East: An Encyclopedia*, Ifrane, ABC-CLIO, 2011, p.60.
[54] Ngoh, *Cameroon History Since 1800*, 1995, pp.22-23.

seventh or eighth century.[55] The Pahuin were known to be energetic, fierce, war-like, decidedly possessing both courage and ingenuity.[56] They were Bantu and most of them lived in the southern and center regions of Cameroon where they depended on the wetland forests for products like mushrooms, and wild game like monkey, Pangolin etc.

All the above discussions have provided knowledge on some of the major ethnic groups in Cameroon, who they were, where they came from and where they are settled today. By doing this, we have been able to provide answers to the three fundamental questions asked at the beginning of this discussions.

1.2.2. Origin of Environmental Considerations in Cameroon

Throughout the colonial era and even after Cameroon gained her independence, environmental issues were not part of political discussions in the country. Cameroon participated in many international meetings such as the Stockholm conference on the environment which took place from the 5th to the 16th of June 1972 in Sweden,[57] world population conference in Mexico in 1984 and set up institutions to monitor the evolution of the environment in Cameroon, like the Standing Committee on Man and the Biosphere created in 1984. Despite all these, the realization of concrete actions carried out with a view to ensure sustainable development was hardly perceptible. Environmental considerations in Cameroon were found mainly in sectorial laws and rules regulating the exploitation of natural resources and those dealing with hygiene and sanitation. Sectorial ministries were responsible for their implementation.

Some environmental actions in Cameroon at the time included degree No. 76-372 of 2 September 1976. This degree regulated the settlement of factories classified as dangerous, unsanitary or inconvenient. Order No. D69/NC/MSP/DMPH/SHPA of 20 August 1980 relating to the collection, transportation and treatment of industrial waste and household waste treatment plans. Article 2 of the 2nd September 1976 degree required as a precondition for opening a classified factory, the presentation of a global plan of the project which clearly shows on one hand that the project`s material disposition efficiently took care of its impacts on the environment and on the other hand, measures taken to comply with hygiene requirements. All

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[55] A.Appiah et al, *AFRICANA: The Encyclopedia of the African and African American Experience*, Great Clarendon street, Oxford University Press, 2005, p.451.
[56] V.Lekeaka, "Insecurity in Business ventures in the City of Yaounde (1987-2016): A Historical Perspective", a Dissertation in history, University of Yaounde 1, 2019, p.21.
[57] J. Peter, From Stockholm to Kyoto: A Brief History of Climate Change, paper retrieved from https://www.un.org, p.2.

these provisions relating to environmental considerations were not sufficiently implemented. Also, they looked at the environment from a limited perspective.[58]

It is generally believed that the year 1992 was the year in which Cameroon really took into account environmental issues in its political discussions. In preparation for the Rio summit, a ministry in charge of the environment was created in 1992 commonly known as MINEF. However, due to the deficiencies of MINEF, the head of state created by degree N^0 2004/320 of 8 December 2004, a ministry which was specifically responsible for the environment and protection of nature known as MINEP which later became MINEPDED. It was created in other to bring in the contributions of Cameroon to major global concerns, relating to the fight against environmental degradation and to ensure the implementation of environmental conventions ratified by the country. The main mission of MINEP was the development, implementation, monitoring environmental policy and the protection of nature.

External and internal factors triggered this environmental consciousness in Cameroon. On the international scene, environmental issues were not a major concern of the international community and the UNO during the early years following the organization`s creation. It was only in 1968 that environmental issues received serious attention from the UNO major organs. This was followed by a call on governments to take into consideration the health of the environment in the pursuit of their developmental objectives. The UNO also organized international environmental conferences aimed at sensitizing the international community and adopting common measures geared towards environmental protection. Cameroon just like many other UNO member states attended some of these conferences and ratified conventions. This motivated Cameroon to take into account environmental issues and consequently bring in its own contribution to the global movement for environmental protection.

Internal factors which explained the gain in consciousness of Cameroonian authorities in respect to environmental issues included the fact that Cameroon had understood the value of its natural resources. Furthermore, the country was also confronted by environmental problems such as climate change.[59] Cameroon had been experiencing an increase in temperatures caused by among others deforestation and the consumption of fossil fuels, though she contributes very little to global GHG emissions.[60] Many sectors in Cameroon such

[58] D. Bitondo, *Environmental assessment in Cameroon: State of the art*, Vol 8, Guildfort, Beech Tree Publishing, 2000, pp.33-35.
[59] Angong Belkima Judith, 51 years, Geologist, Wum, 08 November 2021.
[60] Kamga Roger, 29 years, worker at HYSACAM, Yaounde (Avenue Kennedy), 16 November 2021.

as livestock, fishing, natural resources and forestry, tourism, energy, health and agriculture had been heavily affected by climate change.[61] Research conducted in Batcham for example showed that precipitation levels had greatly reduced in the area between 1974 and 2012. As a result, agricultural activities in the area ended in a fiasco.[62]

Though the reduction of Poverty and the creation of jobs among others, remained a major preoccupation for Cameroonian authorities, the fight against climate change had however not been neglected.[63] Another major environmental problem faced by Cameroon was desertification. The Far North and Adamawa regions had been the hardest hit by this phenomenon.[64] A researcher and plant scientist in the University of Buea, Dr Fonge Beatrice revealed that the causes of desertification were manifold. Human actions such as overgrazing and monoculture accounted for desertification. The symptoms of desertification in the north were very clear; soil erosion caused by wind and/or water, deterioration of the physical, chemical and biological properties of the soil and long term loss of natural vegetation. Another serious environmental problem faced by Cameroon was the pollution of the environment with plastic materials as can be seen in plate 2 below.

[61] Salvador Emmanuel, 49 years, Economist, Yaounde (Chateaux), 18 November 2021.
[62] F.D.Tiwa, "Changement Climatique et Conflits de genre dans l`Agriculture Paysanne dans l`Ouest Cameroun: cas de Batcham" *La revue électronique en science de l`environnement*, No.3, December 2017, p.19.
[63] L.C.Fosso, "Stratégies indigènes d`adaptation aux changement climatique: cas des populations autochtones et communautés locales autour du parc national de boumba bek, est Cameroun", Thèse de master en gestion de l`environnement, Université de Dschang, 2014, p.21.
[64] Mande Nestor, 34 years, member of solidarity network for the environment and leadership, Yaounde (Mvolye), 22 November 2021.

Plate 2: The disposal of plastic waste into water channels in the city of Yaounde, 2021

Source: Author`s field photo, Biyem-Assi (Yaounde), 11/11/2021

Most environmental institutions which exist in the country came into existence in the 1990s. They were divided into institutions with general or transversal competence such as MINEPDED and the ministry of forests and fauna and those with sectorial competence such as MINAT, MINEE, MINSANTE etc. These ministries assisted the ones with general competence in their activities.[65] Central structures of coordination and consultation in environmental management were also created.[66]

In conclusion, the period before 1989 was marked by the absence of genuine environmental considerations in Cameroon. After independence, the ministry of agriculture recreated in 1972 was the institution responsible for environmental issues. Even after the country ratified the Montreal protocol in 1989, the National Ozone bureau was lodged at the ministry of agriculture.

[65] O.Ruppel et al, *Environmental law and policy in Cameroon towards making Africa the tree of life*, London, KAS, 2018, pp. 221-226.
[66] G.H.Fotso, "la protection de l`environnement par les collectivites territoriales decentralisees au Cameroun : cas de la communauté urbaine de Douala", Mémoire de master en Droit et Science politique, l`Université de Douala, 2012, P.54.

1.2.3. Early Efforts Towards Ozone Layer and Wetland Protection in Cameroon

This part of the study investigates the early measures adopted and implemented in Cameroon in respect to ozone layer and wetland protection before the ratification of the Montreal protocol and Ramsar convention.

1.2.3.1. Early Efforts on Ozone Layer Protection

In respect to the Ozone layer, oral and archival sources revealed that there were no major actions taken before 1989, date in which Cameroon ratified the Vienna convention and Montreal protocol, to address the problem of ozone layer depletion. We can therefore deduce from this that, the ratification of both the Vienna convention on ozone layer protection and the Montreal protocol to phase out substances harmful to the ozone layer, marked the beginning of all efforts to protect this natural and vital resource in the country.

1.2.3.2. Early Efforts on Wetland Protection

This consist of measures adopted by Cameroon to protect wetland areas before the ratification of the Ramsar convention in 2006. We shouldn`t forget that there has always existed traditional and local wetland protection practices in Cameroon. These include the crop rotation which helps to conserve soil moisture, the use of fish traps during fishing to reduce over fishing and the traditional zoning of wetland areas to limit the negative impacts of human activities on wetland areas.

1.2.3.2.1. Elaboration and Implementation of Conservation Projects

One of the early measures geared towards wetland protection in Cameroon was through the elaboration and the eventual implementation of conservation projects. A case in point was the “mount Cameroon project”. The mount Cameroon area is found in the coastal zones of Cameroon and is one of the wetland areas of the country. The area is rich in different flora and fauna species and equally inhabits the second wettest place on earth, Debunsha. Unfortunately, this area had been under threat characterized by illegal hunting and abusive deforestation. Based on archival sources, it was due to this problem that in 1994, the government of Cameroon and that of Germany through the ministry of economy and finance (MINEFI) and the technical cooperation agency (TCA) jointly decided to launch the mount Cameroon project.[67] The project had as aim to limit the degradation of this rich ecological area

[67] MINEF, File N^0 03.06.14, impact socio-economique de projet de conservation mont Cameroun sur la localité de Bokwaongo et suggestions pour la protection de la faune, 08 March 2001, pp.9-11.

and ameyorate the living conditions of the population in the area through the sustainable management of their natural resources. This project which took over 11 years divided into three faces ended up being a success as it significantly reduced degradation which was ongoing in the area.[68]

1.2.3.2.2. Creation of Parks

The protection of wetlands in Cameroon before 2006 was also done through the creation of parks which happened to be protected areas. A case in point was the Campo-Ma`an national park. It is found at the coastal regions of Cameroon, it covered a surface area of 264.064 hectares. In the year 2000, the area through degree N^0 2000/004/PM of 06 January 2000 became a national park.[69] This was done in compensation of the environmental damages expected from the Chad-Cameroon oil pipeline project. It was a way of managing and conserving the biodiversity of the area. Currently, the national park is surrounded by five forest management units, industrial rubber plantations, industrial oil palm plantations and a buffer zone.

1.2.3.2.3. Institutional and Judicial Measures

Conscious of the numerous benefits of marine and wetland ecosystems, the government of Cameroon also took certain institutional and judicial measures to protect these areas. At the institutional level, the ministry of the environment and forest was created in 1992. It was in charge of ensuring the proper management of among others, wetlands ecosystems. Also, the management of coastal wetlands necessitated the inclusion of the state, private sector, industries and the local population. Under this, the following actions were taken: measures were taken to monitor marine pollution and coastal erosion in Cameroon, studies were carried out on the possibility of restoring the mangroves forest of the Wouri estuary, studies were also conducted in view of managing marine and coastal wetland ecosystems in a sustainable way.

At the judicial level, Cameroon signed and ratified several conventions which could permit her protect marine and coastal wetland ecosystems. These conventions included: the convention for the creation of the Niger Basin Authority (Faranat, 1980), the convention relative to cooperation in respect to the protection and valorization of marine and coastal zones of the western and central African region.[70]

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[68] *Ibid.*
[69] MINEF, File N^0 11.03.234, Rapport sur la conservation et la gestion durable des ecosystems des forets tropical humides de l`Afrique central: Example de la zone de Campo-Ma`an, 02 January 2003, p.7.
[70] MINEF, File N^0 11.02.166, Rapport nationale du Cameroun sur l`environnement et le developpement durable (Rio + 10), September 2001, p.29.

1.2.3.2.4. Rehabilitation of Wetlands

Also, among some of the early measures taken by Cameroon to protect wetlands figured wetland rehabilitation. A case study was the Waza-Logone floodplain in north Cameroon. This area alone made up 10% of the total surface area of major inland wetlands in the Sahel region. Statistics showed that around the 1930s, about 100 000 people depended on this wetland area for grazing in the dry season, fishing and agriculture. This area was of much value to the resident and nomadic community due to the presence of wetland products such as: rice, fish, cereals, meat, milk, timber, firewood, wild grains, medicines, game etc. This wetland area played a central role in sustaining the economy of the area during the dry season. The area was also a haven for various bird species like vultures, ostriches, marabous, heron, ibis etc. It also supported a large number of migratory birds which annually migrated to Europe and came back six months later.[71]

Things took an ugly turn in 1979 when a dam was constructed by SEMRY across the Waza-Logone floodplain to create a reservoir called Lake Maga for rice cultivation. As a result, water could no longer extend far from the river again leading to changes in its vegetation. Some vegetation types completely disappeared from the area. Fish population also reduced and migratory water birds could no longer find suitable habitats in the region. It was faced with this problem that the government of Cameroon in collaboration with other partners launched the Waza-Logone project in 1992. The objective was to enhance the biodiversity of the Waza-Logone area and provide sustainable improvement in the life of its inhabitants. To achieve this, the Waza-Logone area had to be reinundated and the local communities had to be included in managing the area. The project eventually culminated to the restoration of the wetland area.

1.2.3.2.5. Making Wetlands Public Property

President El Hadj Ahmadou Ahidjo in his time understood the necessity to protect wetland areas. This explains why on 6 July 1974, he signed an order making all wetland areas in the country public property. By interpretation, it meant that individuals could not claim ownership of wetland areas. Article 3 of the order clearly describes wetland areas which constitutes the public domain and hence, under state protection.[72]

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[71] P.E Loth, *The return of the water: Restoring the Waza Logone floodplain in Cameroon,* Gland, IUCN, 2004, pp.5-8.
[72] Ordonnance N^0 74-2 du 6 Juillet 1974 fixant le régime domanial.

This chapter clearly revealed the geographical location as well as the physical environment of Cameroon. It proceeded to study the ozone layer problem. Cameroon contributed to ozone layer depletion through its importation and consumption of CFCs and equipment containing them such as refrigerators, air conditioners, fire extinguishers etc. It also presented wetland ecosystems in Cameroonian, their flora and fauna and the importance of these wetlands which included among others the fact that they guarantee good water quality, they provide habitat for many species of amphibians, reptiles, mammals, birds and recreational opportunities. However, these wetlands had been facing problems threatening their existence. Furthermore, this chapter examined the origin, migration and settlement of some major Cameroonian ethnic groups who inhabit the country today. It also showed the historical origin of the consideration of environmental issues in Cameroon and ends by presenting some early measures taken with aim to protect wetlands in Cameroon. Since no measures existed in the country in respect to ozone layer protection, this pushed the researcher to study in the next chapter, efforts taken by the country to protect the ozone layer after the ratification of the Montreal protocol in 1989.

CHAPTER TWO

THE MONTREAL PROTOCOL: GENERALITIES AND IMPLEMENTATION IN CAMEROON

The ozone layer is a strategic natural resource. In fact, all forms of life on earth depend on its ability to absorb the high UV waves coming from the sun.[1] Science had already been able to clearly establish the fiasco which awaits man and the environment if the ozone layer fails to maintain its function. Despite its visible importance, the ozone layer, due to anthropogenic factors, had progressively been destroyed. Humans have always sought for ways to develop and improve their living conditions. Some of these ambitions sometimes turned out to be detrimental for the environment. Cameroon produced and imported ODS or substances which contained them. Just like many other countries, Cameroon also contributed to the emission of ODS into the atmosphere leading to ozone layer depletion. However, conscious of the ozone problem, Cameroon decided to ratify the Montreal protocol to phase out substances which deplete the ozone layer on August 30, 1989. Since then, Cameroon has multiplied efforts to implement this IEL in the country, there by contributing to global efforts geared towards repairing the already affected ozone layer. In this chapter, some generalities about the Montreal protocol are clearly exposed. The second part of the chapter examines the implementation of the Montreal protocol by Cameroon since 1989.

2.1. The Montreal Protocol on Substances that Deplete the Ozone Layer

This section of the work brings into lamp light the objective of the Montreal protocol as well as some major demands or provisions of the protocol. It ends by studying the reasons which pushed Cameroon to ratify the Montreal protocol.

2.1.1. Objective of the Montreal Protocol

The main objective of the Montreal protocol was to protect all life forms on earth by phasing out substances which destroy the ozone layer (see table 1). It's important to note that the Montreal protocol, contrary to the Vienna convention on ozone layer protection, was specific and a legally binding agreement. This was a necessary condition which enabled it meet its objective. The table below shows some ODS which the Montreal protocol was formulated to fight against, due to their negative effects on the ozone layer.

[1] Report of the 33rd edition of the international day for the preservation of the ozone layer 2020, 2020, p.12.

Table 1: Some ozone depleting substances (ODS) and their ozone depleting potential (ODP)

No	ODS	ODP
1	Trichlorofluoromethane (CFC-11)	1
2	Dichlorodifluoromethane (CFC-12)	1
3	Chlorotrifluoromethane (CFC-13)	1
4	Bromochlorodifluoromethane (Halon 1211)	3
5	Bromotrifluoromethane (Halone 1301)	10
6	Methyl Bromide (CH3Br)	0.7
7	Methyl Chloroform (C2H3CI3)	0.1
8	Dibromotetrafluoroethane (Halon 2402)	6
9	Trichlorotrifluoroethane (CFC-113)	0.8
10	Chloroheptafluoropropane (CFC-217)	1
11	Tetrachlorofluoroethane (HCFC-121)	0.01-0.04
12	Monochlorofluoromethane (HCFC-22)	0.02
13	Trichlorofluoroethane (HCFC-131)	0.007-0.05
14	Dichlorofluoroethane (HCFC-141b)	0.11
15	Hexachlorofluoropropane (HCFC-221)	0.015-0.07
16	Pentachlorofluoropropane (HCFC-231)	0.05-0.09
17	Monochlorofluoropropane (HCFC-271)	0.001-0.03
18	Monochlorodifluoropropane (HCFC-262)	0.002-0.02
19	Dichlorofluoropropane (HCFC-261)	0.002-0.02
20	Monochlorotetrafluoropropane (HCFC-251)	0.001-0.01

Source: United States Environmental Protection Agency

The above table of ODS can be found in substances such as refrigerators, freezers, dehumidifiers, water coolers, ice cream machines, air conditioners and heat pumpers, air conditioners found in cars, aerosol (spray), fire extinguishers etc.[2]

[2] PNUE, *Les traités sur l`ozone*, Nairobi, UNEP/Earthprint, 2019, p.88.

2.1.2. Major Provisions of the Montreal Protocol

The Montreal protocol is so far one of the most successful protocols in the history of the UNO. It`s provisions were well crafted in view of reducing or completely putting an end to the emission of ODS. It was more successful than the Vienna convention on ozone layer protection. However, multiple factors led to its global success. The deep cooperation of the international community greatly contributed to its success.[3] Negotiators of this protocol worked in collaboration with scientists, this gave the protocol more credibility. The protocol was made up of 20 articles and these were flexible by nature. This was good because over time, the protocol underwent amendments following new scientific discoveries. These amendments resulted to stricter control measures on ODS.[4]

The Montreal protocol was a success at the level of implementation because chemicals and sectors were clearly articulated. The protocol also provided a stable framework which allowed to put in place long term research and innovation programs. To encourage industries to move away from CFCs, certain benefits were put in place which effectively caught the attention of these industries. One of the features of the Montreal protocol was the independent technology and economic assessment panel. This helped signatories to adopt solid and timely decisions on complex matters. The creation of the multilateral fund also explains why the provisions of the protocol were taken seriously by parties to the protocol. The present provisions of the Montreal protocol are expected to restore the ozone layer back to its 1980 levels by 2060.

Article 2 of the Montreal protocol focused on control measures. It was aimed at controlling the consumption levels of parties to the protocol. This article also limited the production levels of parties to the protocol. After the entry into force of the Montreal protocol, every after twelve months, parties had to make sure that their calculated levels of controlled substances did not exceed their 1986 levels. Parties to the protocol were not to rise above 80% of their 1986 ODS productions levels. Parties which were part of regional economic organizations, could decide to jointly implement the provisions of the Montreal protocol at their regional level. This was only permitted if all members of the economic organization were parties to the Montreal protocol and had informed the secretariat about their implementation plan.

[3] Njo Rose, 42 years, Biologist/Researcher, Kousseri (Hotel de Ville), 05 September 2022.
[4] Effoe Christopher, 39 years, Biologist/Researcher, Kousseri (Hotel de Ville), 05 September 2022.

Article 3 made it obligatory for parties to the Montreal protocol to calculate their levels of production, import, export and consumption. This was to be done for the purpose of article 2 and 5 of the protocol. It is actually believed by so many people that article 4 of the protocol greatly contributed to its global success. This article laid down regulations on trade in controlled substances with non parties to the Montreal protocol. The export of controlled substances to states which were not parties to this protocol was forbidden. This article further banned the import of controlled substances by parties to the protocol, from states which were not parties to the protocol. All parties to this protocol were in addition, not permitted to export any technology which could permit non parties to produce or make use of controlled substances. Parties were encouraged to stop the provision of subsidies, equipment, aid, credits and insurance programs for the export of products, plants, equipment or technology which could facilitate the production of controlled substances.[5]

However, equipment, products, plants and technology which could improve the containment, recovery, recycling or destruction of controlled substances, promote the development of alternatives to controlled substances or contribute to the reduction of the emission of controlled substances were exempted from this law. The import of controlled substances by states not parties to this protocol was only to be authorized in the case where the state in question was in compliance with article 2 and 4 of the Montreal protocol.

A careful study of article 4 shows that countries which desired to freely import and export controlled substances were forced to ratify the protocol. This is why it was said that article 4 contributed to the global success of the Montreal protocol. It remains one of the reasons which today explain why all UNO member states have ratified the protocol. In a global sence, this article was to make sure that, industries of parties don`t import controlled substances from non party states. It was also to ensure that they don`t escape their phase out schedules by transferring their production to non party states and re-importing these controlled substances for local consumption. It should be noted that according to UNEP, a non party referred to a country which had signed this protocol, but whose government had not yet ratified, accepted or approved this protocol or any of its amendments.[6]

Article 5 of the Montreal protocol recognized the inability of developing countries to implement this protocol within the time limits set by the protocol. Contrary to developed

[5] The Montreal protocol on substances that deplete the ozone layer.
[6] *Ibid.*

countries, developing countries operating under article 5 were given a longer phase out period for most controlled substances. Most of such controlled substances were listed on annex A, B, C and E of the Montreal protocol. The time given for article 5 countries to implement the Montreal protocol exceeded by 10 years the time given to developed countries to implement this protocol.

The preferential treatment granted by article 5 to developing countries was to enable them address certain problems. Such problems included the fact that most developing countries heavily depended on ODS and had no access to alternative knowledge, technologies and capital investment. The lack of capital investment simply made it impossible for article 5 countries to implement the control measures of the Montreal protocol. This article was intended to provide developing countries with enough time to acquire all the technical and policy support they needed to permit them switch to accepted alternatives to controlled substances.[7]

To facilitate their compliance with the demands of the Montreal protocol, article 5 countries were to be provided with financial and technical assistance. Article 5 also had as aim to encourage developing countries to ratify and implement this treaty. Article 10 of the Montreal protocol established the financial mechanism which could provide alternatives to controlled substances and related technologies to developing countries who were in need of this. The multilateral fund was set up to provide the funds needed by article 5 countries to implement the protocol. Article 10A, in addition to the provision of technology, encouraged all parties to do everything possible in making sure that the best available environmentally safe technologies were transferred to article 5 countries.

Article 7 of the Montreal protocol laid emphasis on data reporting. Parties to the protocol had to provide statistical data on their production, imports and exports of controlled substances. This data was to be provided on an annual bases to the secretariat. Through this data, the secretariat was able to know if parties were in conformity to the protocol or not. It was a sort of control instrument.[8]

According to article 9 of the Montreal protocol, research, development and exchange of information on technologies which could help contain, recover or recycle ODS or limit their emissions was encouraged. Also, parties to the Montreal protocol had the important task of sensitizing their population on the negative effects of ODS emissions. This was fundamental

[7] *Ibid.*
[8] *Ibid.*

for the effective implementation of the Montreal protocol. It was intended to solve the problem of ignorance which contributed to the emission of ODS.

People often face difficulties in distinguishing between the Vienna convention on Ozone layer protection and its Montreal protocol. The Vienna convention adopted in 1985 was a framework convention which failed to establish any controls on the consumption and production of ODS. It limited its self in calling on parties to study, research and report on different aspects of ozone layer depletion. Just two months after the Vienna convention was adopted, scientists discovered the ozone hole.

This showed that the ozone layer problem was more serious than thought. This caused parties to the Vienna convention to see the need for stronger measures in addressing the ozone layer problem. Two years of intense negotiations between governments, with the help of scientists, resulted to the adoption of the Montreal protocol on September 16, 1987. This treaty entered into force on January 1, 1989 and by 2009, 195 countries had ratified it. The Montreal protocol contained binding rules as far as ozone layer protection was concerned. It also gave a time table which countries were to respect in phasing out their production and consumption of ODS.

2.1.3. Reasons why Cameroon Ratified the Montreal Protocol

Remember that Cameroon ratified the Montreal protocol in 1989.[9] This considerably contributed to the efforts of the government to manage the environment sustainably. The following factors explains why the government of Cameroon ratified the Montreal protocol.

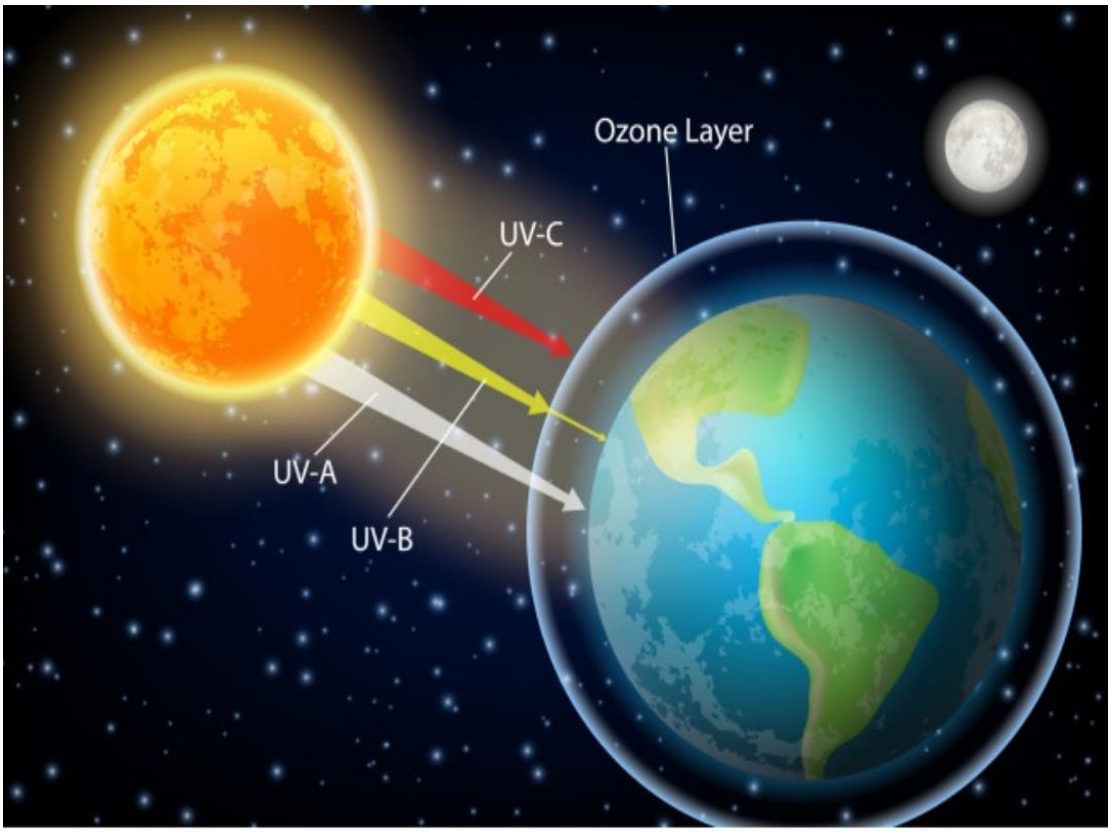
2.1.3.1. Consciousness of the Dangers of Ozone Layer Depletion

In an effort to protect the ozone layer, Cameroon began by ratifying the Vienna convention on ozone layer protection. This was the mother convention of the Montreal protocol also ratified by Cameroon. The country has also ratified all the amendments to this protocol right up to the Kigali amendment in 2021.[10] These actions demonstrated the goodwill of the country to ensure that the ozone layer effectively prevents UV radiations from reaching the earth surface. Scientists were able to classify UV radiations into three categories. These include: UV-A, UV-B and UV-C radiations (see figure 1). Among all these, UV-C does not reach the earth surface and UV-B is partially filtered by the ozone layer. UV-A is not filtered at all by the

[9] *Ibid*.
[10] Law N^0 2019/011 of 19 July 2019 authorizing the president of the republic to ratify the Kigali amendment to the Montreal protocol on substances that deplete the ozone layer.

ozone layer. However, UV-B radiation has been the most dangerous and responsible for damages on human health and the environment.[11]

Figure 1: The ozone layer acting as a shield over the earth against dangerous UV radiations

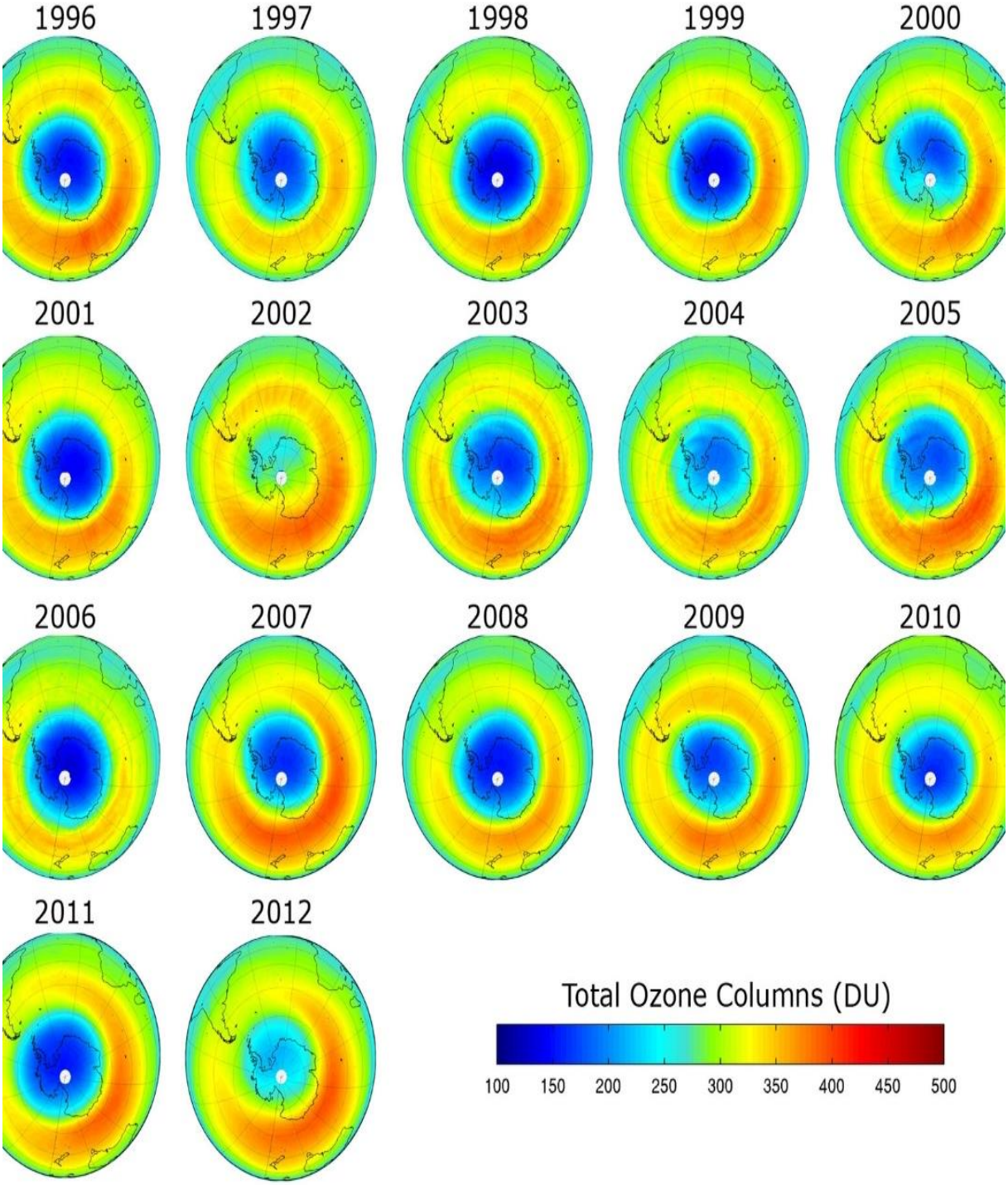


Source: https://www.discovermagazine.com/environment/whatever-happened-to-the-hole-in-the-ozone-layer consulted on 19/03/2022 at 12:12pm

Figure 1 shows the ozone layer protecting the earth from UV radiations. As earlier mentioned and as can be seen in figure 1, UV-C radiations do not arrive the earth surface. UV-A radiations are not filtered at all by the ozone layer and so reach the earth surface. But it was proven that UV-A radiations presented no real danger to plant and animal life on earth. UV-B radiations were partially filtered by the ozone layer as can be seen and turned out to be the most dangerous solar radiation for plant and animal lives on earth. The inability of the ozone layer to effectively prevent UV-B radiations from reaching the earth had been worsened due to anthropogenic release of ODS.

[11] UNEP, *Saving the ozone layer: phasing out ozone depleting substances in developing countries*, New York, United Nations Publications, 2008, p.2.

Figure 2: The ozone hole (the blue spots represent the ozone hole)



Source: https://www.esa.int/Enabling_Support/Preparing_for_the_Future/Space_for_Earth

Figure 2 above clearly depicts the dynamic nature of the ozone hole[12] since 1996. The size and concentration of the ozone hole was determined by the amount of ODS present in the atmosphere. Looking at figure 2 above, we quickly notice a reduction in the size and concentration of the ozone layer in 2012. Also, figure 2 clearly shows the evolution of the ozone hole from 1996 to 2012. Base on this, we can clearly see that the ozone layer has been expanding and contracting over time. These contractions can be attributed to efforts taken by parties to the Montreal protocol to close the ozone layer hole so as to protect all life forms on earth. Science had established that an increase in UV-B radiations reaching the earth surface had the following consequences for man and the environment:

2.1.3.1.1. Skin Cancer

Many epidemiological studies had shown that UV-B radiations are responsible for skin cancer in humans. The risk of getting this skin cancer was greater for people who spend a lot of time exposed under solar radiation. The type of cancer known as basal cell carcinoma usually occurred only on the parts of the body directly exposed to solar radiations. These parts happened to include the arms, face, hands, scalp and neck. Repeated severe exposure to solar radiation in one`s early life happened to be an important factor for the development of skin cancer.

2.1.3.1.2. Eye Damages

The outer epithelial layer of the eye, cornea and conjunctiva absorbed UV radiations from the sun. Too much exposure to UV solar radiations was known to damage the external tissues of the eye. The relationship between UV-B radiations and eye cataract remained complex.

[12] In some popular media platforms and books, the term “ozone hole” is usually used too loosely. The term is frequently employed to refer to any episode of ozone depletion, no matter how minor it is. This way of conceptualizing the ozone hole is not good because it prevents the public from distinguishing between the massive ozone losses in Polar Regions and the smaller but significant ozone losses in other parts of the earth. The term “ozone hole” should be understood as regions of the earth where stratospheric ozone depletion is so severe that levels fall below 200 Dobson Units (D.U), the traditional measure of stratospheric ozone. Normal ozone concentration in the stratosphere is about 300 to 350 D.U. Such ozone losses have been registered above Antarctica and to a lesser extend the Artic.

2.1.3.1.3. Impacts on the Human Immune System

It had been proven that UV radiations led to local and systemic immunosuppression. The immunity of cells was affected by high exposures to UV radiations. The immediate effect of this was reduced resistance to viral and bacterial infections.[13]

2.1.3.1.4. Impacts on Plants

The physiological and developmental processes of plants were affected by UV-B solar radiations. Plant species in forests and grasslands were affected by UV-B solar radiations as it led to changes in their composition. High radiations also led to changes in form and secondary metabolism.[14]

2.1.3.1.5. Impacts on Aquatic Ecosystems

Increase UV-B solar radiations also affect the productive capacity of aquatic ecosystems. This was also dangerous for humans who obtained 30% of their animal protein from the sea. In the tropical regions, increase UV-B radiations led to the destruction of phytoplankton which happened to be the foundation of aquatic food web. This was a clear threat to the early developmental stages of fish, shrimp, amphibians, crab etc.

2.1.3.1.6. Impacts of Ozone Layer Depletion on Climate Change

Climate change and ozone depletion have always been linked in a number of ways. Ozone depletion was not a direct cause of climate change but affected the temperature balance of the earth. It absorbed UV radiations which led to an increase in atmospheric temperatures. It also absorbed infrared radiations emitted by the earth`s surface there by trapping heat in the atmosphere. It`s clear from all this that changes in the ozone concentration affected the atmospheric climate.[15] The ratification of the Montreal protocol by Cameroon`s government, was indeed a fundamental step to phase out CFCs responsible for ozone depletion and healing the ozone layer.

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[13] S. Kovats et al, *Climate change and stratospheric ozone depletion: early effects on our health in Europe*, Copenhagen, WHO regional office Europe. 2000, pp.53-54.
[14] S.R. Kumar, "Ozone layer depletion and its effects: A review", *International Journal of Environmental Science and Development*, Vol 2, February 2011, pp.35-36.
[15] *Ibid.*

2.1.3.2. The Influence of Foreign Powers

Just like the convention on wetland protection, especially as waterfowl habitat, it is believed that foreign powers influenced Cameroon to ratify the Montreal protocol. These external powers, most of whom are European powers, formulate these environmental conventions. Once such conventions were formulated, some pressure was exerted on African countries in general through certain mechanisms, or strategies which were put in place to attract and influence them to ratify and implement these conventions.

This can be explained by the fact that African countries in general lacked a heavy voice on the international scene. In most cases, African countries including Cameroon just aligned with the decisions of these foreign powers, particularly those of their former colonial masters. This foreign influence was so strong that in Cameroon, the environmental policies of the country had, and still has the finger prints of foreign environmental actors. In a nutshell, the influence of foreign environmental powers cannot be belittled as far as the ratification of the Montreal protocol was concerned.[16]

2.1.3.3. Desire to Bring in its Own Support to the Global Fight for Ozone Layer Protection

The Montreal protocol regulated the production and consumption of about one hundred man-made chemicals referred to as ODS. The protocol had different time tables for putting an end to the production and consumption of ODS for developed and developing countries (in the protocol, developing countries were referred to as article 5 countries). Due to the universal success of the Montreal protocol, it was estimated that the ozone layer will become as it was in 1980 between 2050 and 2070. The Montreal protocol remains till today a symbol of the success of universal cooperation[17]. Kofi Annan, former UNO sectary general openly admitted that the Montreal protocol remains perhaps the single most successful international agreement till date.

This can be explained by the fact that it is an international agreement ratified by all countries on earth. This implies that the Montreal protocol has been ratified by all 197 members of the UNO and currently being implemented. It remains one of the successes and pride of the UNO. Looking at the global response to the call to phase out ODS, Cameroon could not stay

[16] L.N Nsana, "La politique environementale du Cameroun à la lumiére de la coopération internationale : une analyse de l`influence des grands acteurs environnementaux globaux", Mémoire de master en Diplomacie, Université de Yaoundé II-IRIC, 2015, pp.1-20.

[17] UNEP, *Hand book for the Montreal protocol on substances that deplete the ozone layer*, Nairobi, UNEP/Earthprint, 2006, p.9.

isolated from such a global movement.[18] All UNO member states were ratifying the protocol as a means of contributing to the global fight for ozone protection. There was just no way Cameroon could remain the only UNO member state not to have ratified the protocol, as a means of bringing in its own expected support to the global fight geared towards the protection of the ozone layer.[19] From all these, it can be concluded that Cameroon`s desire to also bring in its own contribution to the global fight for ozone layer protection like all other UNO member states motivated her to ratify the Montreal protocol.

2.2. Implementation of the Montreal Protocol in Cameroon

Considering that efforts geared towards ozone layer protection in Cameroon kicked-off only after the country ratified both the Vienna convention, and the Montreal protocol in 1989. This section studies some actions taken by Cameroon in respect of the demands of the Montreal protocol.

2.2.1. Global Measures Taken to Implement the Montreal Protocol

This makes reference to all measures taken by Cameroon at the global or international level to ensure that the Montreal protocol is implemented. To an extent, this section helps us understand the international obligations of parties to the protocol. It helps us see to what extend Cameroon has fulfilled its international obligations towards the protocol.

2.2.1.1. Ratification of Amendments to the Montreal Protocol

The conference of the parties to the Vienna convention negotiated the Montreal protocol in 1989. The protocol made emphasis on CFCs and halons as substances which had to be controlled strictly, due to their devastating effects on the ozone layer. The production and consumption of this control substances had to cut down by 50% from their 1986 levels by 1999. For example, if country A was consuming 80 tons of controlled substances in 1986, she was expected to have reduced her consumption to 40 tons before the year 2000. The protocol also gave powers to the parties to make adjustments in the schedule of reduction in the production and consumption of control substances. In addition, the conference of the parties was authorized by the protocol to make recommendations on what additional ODS should be included in the

[18] Ashu David Orock, 53 years, environmental activist, Buea (Clerks Quarters), 25 March 2022.
[19] *Idem.*

list of substances needing control. Such additions had to be ratified by two-thirds of the parties to the protocol.[20]

It`s reasonable to think that, during the formulation of this protocol, scientific knowledge on ODS was still limited but in progress. This should probably explain why the founding fathers of the Montreal protocol included article 11(4). This article which as earlier mentioned, authorized parties to the protocol to add new chemicals to the list of substances needing control, also authorized the parties to carryout amendments to the Montreal protocol. Consequently, with time, deeper research and scientific discoveries in respect to the ozone layer problem necessitated amendments to the Montreal protocol. As of now, the Montreal protocol has undergone six amendments in total since its adoption.[21]

These amendments include the London amendment of 1990. It added methyl chloroform to the list of controlled ODS. Developed countries were expected to phase out this chemical by 2005 while developing countries had up till 2015 to phase out this chemical. The Copenhagen amendment of 1992 incorporated HCFC. Developing countries had to phase out this ODS beginning 2004. In respect to this agreement, CFCs, halons, methyl chloroform and carbon tetrachloride had to be completely phased out in developed countries by 1996.[22] The Vienna adjustment of 1995 called on the parties to phase out the consumption of methyl bromide in developed countries by 2010. It also introduced control measures for methyl bromide.[23]

The Montreal amendment of 1997 was aimed at phasing out HCFCs in developing countries. The Beijing amendment of 1999 called for tightened controls on the production and trade of HCFCs. It also added bromochloromethane to the list of controlled ODS with phase out by 2004. The most recent amendment was the Kigali amendment of 2016. It aimed to phase down the production and consumption of HFCs because these substances had been adopted by industries as substitutes for ODS. It should be noted that HFCs are not actually ODS but rather GHGs which damage the earth`s climate.

Oral sources reveal that Cameroon has been able to respect article 11(1) of the Montreal protocol, by taking part in international meetings organized on issues in relation to the protocol, ozone layer etc. The above mentioned article calls on parties to organize meetings at regular

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[20] UNEP, The Montreal protocol on substances that deplete the ozone layer, paper retrieved from https://www.ozoneunep.org consulted on 07/04/2022 at 12:52pm.
[21] Report on the amendments to the Montreal protocol on substances that deplete the ozone layer, 2002, p.2.
[22] *Ibid*.p.2.
[23] UNEP, *Saving the ozone layer: phasing out ozone depleting substances in developing countries*, New York, United Nations publications, 2008, p.15.

intervals. By extension, all parties to the Montreal protocol were encouraged to take part in such meetings. On the international scene, Cameroon can be proud of the fact that she has been able to ratify all the amendments to the Montreal protocol.[24] The most recent ratification of an amendment to the Montreal protocol by Cameroon was the Kigali amendment in 2021.[25] This international actions show Cameroon`s determination to contribute in protecting the ozone layer.

2.2.2. Regional Measures Taken to Implement the Montreal Protocol

This refers to measures taken by Cameroon, alongside other countries at the regional level. The region in question comprises the 6 CEMAC countries of Central Africa namely Chad, Cameroon, Congo, Central African Republic, Equatorial Guinea and Gabon.

2.2.2.1. Formulation of Measures Applicable to the CEMAC Region on the Control of ODS

CEMAC is an economic community of the African Union. It was established for the promotion of regional economic cooperation in central Africa.[26] Efforts to establish regional and sub-regional integration in Africa can be traced back to the immediate post-colonial period. These regional and sub-regional groupings were to be the starting blocks towards a future continental political and economic integration.[27] This dream which had been carried by pan-Africanists such as Kwame Nkrumah explains the creation of RECs (Regional Economic Communities) in Africa among which include CEMAC. This regional organization was created in 1994 but became operational in 1999 after its treaty was ratified.[28]

Its aim was to achieve collective autonomy, raise standards of living and maintain economic stability through harmonious cooperation. It's worth noting that the objectives of CEMAC are not just limited to political and socio-economic objectives. Issues related to the environment were also embraced by the regional community. These include: to fight against, floods and other natural calamities, the protection of biological diversity, ensure the rational exploitation of forests, ecological management of dangerous waste and a ban on the importation of these waste products, the exploitation of renewable sources of energy, particularly solar

[24] Anonymous.
[25] Report of the 33rd edition of the international day for the preservation of the ozone layer 2020, 2020, p.10.
[26] Mbonsisi Leonard, 38 years, Farmer, Bamenda (Meta Quarter), 11 January 2022.
[27] Folefack Armel, 47 years, Member of Solidarity Network for the Environment and Leadership, Yaounde (Nlongkak), 10 April 2022.
[28] Atangana Dorcas, 43 years, Member of Solidarity Network for the Environment and Leadership, Yaounde (Nlongkak), 10 April 2022.

energy and preservation of rural and urban environment, including the protection of the ozone layer.

Attention is focused on the last objective which falls in line with the context of this study. Cameroon and the other five CEMAC countries had ratified the Vienna convention on ozone layer protection and its Montreal protocol. Cameroon in its effort to contribute in protecting the ozone layer, willingly joined efforts with other CEMAC countries in seeking regional measures to control the emission of ODS. The eventual elimination of ODS in the region had also been previewed. This ambitious vision also motivated the organization of a meeting attended by environmental ministers of the CEMAC region. The meeting took place in Libreville, capital and largest city of Gabon, on November 4, 2004. Cameroon was represented by Mr Tanyi-Mbianyor Clarkson Oben, who was the Cameroonian minister of the environment and forest.[29]

Cameroon and other CEMAC members adopted many important points at the end of the meeting among which figured the following: the appropriate use of ODS, ban on the production of ODS in all CEMAC countries, control of the import, production and sales of second handed equipment containing ODS, the import, export and re-exportation of ODS or equipment containing ODS are controlled based on regional agreements and the Montreal protocol, the environmental ministers of each member state should fix annual quotas on the importation of ODS and communicate these quotas to the minister in charge of commerce and the minister in charge of finance, the transport of ODS in the CEMAC zone had to be done in respect to norms in force in each member state, during the transport of ODS or equipment containing them, the transporters had to take all necessary measures to prevent the emission of these ODS into the atmosphere, each member state had to put in place a committee to follow up and control ODS in their respective countries. This committee had to be under the authority of the minister of environment.[30] Such measures proved the good will of CEMAC countries in general, and Cameroon in particular, to eradicate ODS and protect the ozone layer in respect to the Montreal protocol.

[29] Règlement N^0 09/05-UEAC-143-CM-13 portant adoption de la réglementation commune sur le contrôle de la consommation des substances appauvrissant la couche d`ozone dans l`espace CEMAC.
[30] *Ibid*.

2.2.3. National Measures Taken to Implement the Montreal Protocol

This section examines measures taken by Cameroon at the national level in respect of the Montreal protocol to protect the ozone layer.

2.2.3.1. Institutional Measures to Protect the Ozone Layer

After the ratification of the Montreal protocol, Cameroon was able to put in place a country program to implement the Montreal protocol. The program put in place by Cameroon was developed with the help of an international expert and sponsored by UNEP. Still as a response to the Montreal protocol, Cameroon created the ministry of environment and forestry in 1992. This ministry was responsible for the definition and implementation of the environmental policy of Cameroon. This ministry later formed an interministerial working group made up of representatives from the ministry of environment and forestry, the ministry of agriculture, the ministry of mines, water and energy, the ministry of trade and industry, the ministry of scientific research, the ministry of health and the ministry of transport. A representative of an NGO was also part of the group. Representatives from the private sector held observer positions.

This working group was under the supervision of the ministry of environment and forestry. The group had the task of defining the country`s ozone policy. This was to be in line with the objective of the government which was to eliminate in the most cost effective way, the consumption of CFCs in accordance with the Montreal protocol. Still in line with institutional measures adopted by Cameroon to phase out ODS, the ozone monitoring commission (OMC) was established.[31] The following were the objectives of the OMC: the provision of a consultative role in the formulation and promulgation of specific policies which make up the national ozone plan of action, to help in the development of voluntary agreements whenever important within the industry to establish specific end-use bans in respect to the ODS phase out program, to monitor phase out progress and also evaluate the need to increase the price of ODS to levels which substitutes to these chemicals become more financially attractive. Thus, this was to contribute to faster the phase out of ODS in the country, to help put in place a licensing system for ODS users which will encourage environmentally responsible handling practices, to help establish import monitoring procedures of ODS into Cameroon. From this, progress in

[31] UNIDO report on a feasibility study of the financial implications of the FAEM CFCs phase out project, July 1996, pp.1-4.

reducing ODS consumption was to be measured so as to bring in appropriate adjustment programs and policies and to help carryout public awareness in respect to the ozone problem.[32]

2.2.3.2. Judicial Measures to Protect the Ozone Layer

Judicially, there exist laws in Cameroon formulated to protect the atmosphere, including the ozone layer. Such laws include law N^0 96/12 of August 1996 relating to environmental management. Article 21 of its chapter three prohibits the discharge of any pollutants into the air, especially smoke, toxic, corrosive or radioactive dust or gases beyond the limits laid down by the enabling instruments of this law or other instruments. In direct connection with the ozone layer, article 24 of this same law calls on competent administrative units, in collaboration with the administration in charge of the environment and the private sector to take the following measures: implement the Montreal protocol and its amendments, develop renewable sources of energy and preserve the regulatory function of forest on the atmosphere.[33]

Other laws on ozone layer protection in Cameroon include: degree N^0 2011/2581/PM of August 2011 regulating harmful and/or hazardous chemical substances, joint order N^0 005/MINEPDED/MINCOMMERCE of 24 October 2012 regulating specific conditions for the management of electrical and electronic equipment and also the final elimination of waste resulting from this equipment,[34] order N^0 029/CAB/PM of 04 April 2014 fixing modalities for inspections and controls of merchandise by the technical services of the state at the Douala port, degree N^0 2011/2582/PMDU of August 2011 fixing modalities for the protection of the atmosphere in Cameroon. This regulated the control and elimination of sources of pollution which may have had negative effects on the atmosphere including CFCs and HCFCs, order N^0 001/MINEPDED of 15 October 2012 fixing the condition of obtaining an environmental permit in the waste management sector and order N^0 002/MINEPDED of 15 October 2012 fixing specific condition for managing industrial waste.

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[32] *Ibid.*
[33] Law N^0 96/12 of August 1996 relating to environmental management.
[34] H. Mboh, Cameroon updates of the implementation of the Montreal protocol, sharing of successful practices, challenges and country's needs, paper retrieved from https://www.slidetodoc.com consulted on 14/04/2022 at 07:01pm.

2.2.3.3. Ban on the Import of Equipment Containing ODS and the Establishment of Measures to Limit ODS Emissions by Local Industries

Among the many measures adopted by Cameroon in respect to the Montreal protocol, figures the ban on the import of equipment containing ODS.[35] In 1996, through decision N^0 985/MINDIC/CAB of 15 October 1996 on the ban of the importation of equipment and appliances using substances which deplete the ozone layer to Cameroon, the government of Cameroon officially banned the entry of equipment and appliances containing ODS into Cameroonian soil. This decision has remained in force till today. This clearly shows Cameroon`s devotion in protecting the ozone layer. Not to forget is the fact that, still at the level of border measures, Cameroon was able to establish a licensing system and quota aimed at reducing the amount of ODS in Cameroon.[36] In addition, research was able reveal that as of September 2020, Cameroon had delivered over five thousand five hundred (5500) technical visas aimed at controlling the quality and quantity of ODS entering Cameroon.[37] According to information revealed by the focal point,[38] nobody could import ODS into Cameroon without authorization (technical visa).[39]

It should also be noted that Cameroonian based industries also imported and made use of ODS. An example is FAEM (société anonyme de fabrication d`appareils electro-ménagers). FAEM was created in 1979 by a group of Cameroonians. It had as objective, the assembling of household appliances including air conditioners, freezers and refrigerators. This company greatly made use of ODS such as CFC-11 in the production of refrigerators.[40] This is so because CFCs are used as fluids for the cooling mechanism of refrigerators and air conditioners. Research had even shown that between 1997 and 2005, FAEM would produce and sell many refrigerators and freezers in Cameroonian markets containing ODS as can be seen in the table below.[41]

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[35] Assangmu Diaza, 52 years, Runner of a refrigeration enterprise, Yaounde (Efoulan), 13 April 2022.
[36] Ngono Pierre, 41 years, Co-runner of a refrigeration enterprise, Yaounde (Efoulan), 13 April 2022.
[37] Report of the 33rd edition of the international day for the preservation of the ozone layer 2020, 2020, p.10.
[38] This term is commonly used to refer to the coordinator of the Cameroon national ozone office.
[39] Interview with Anonymous.
[40] UNIDO report on a feasibility study of the financial implications of the FAEM CFCs phase out project, July 1996, pp.6-11.
[41] *Ibid.*

Table 2: Estimated quantity of refrigerators and freezers which will be sold by FAEM between 1997 and 2005

Refrigerators		Freezers	
Year	**Sales**	**Year**	**Sales**
1997	3300	1997	6500
1998	4000	1998	7500
1999	5000	1999	9000
2000	5750	2000	10350
2001	6325	2001	11400
2002	6640	2002	11950
2003	6970	2003	12550
2004	7200	2004	12930
2005	7400	2005	13320
Total	**52,585**	**Total**	**95,500**

Source: Report on the phasing out of CFCs by FAEM S.A, Douala, July 22, 1996

The government of Cameroon had banned the importation of equipment and appliances containing ODS.[42] However, with such quantity of refrigerators and freezers which were to be release into Cameroonian markets by FAEM, it's clear that the government`s ban on ODS contained equipment and appliances will have had no major impact in the long run. Faced with this, the government of Cameroon adopted the following measures to eliminate the problem: buying equipment and technical support necessary to facilitate a switch from CFCs to non-ODS refrigerator production, processing, recovery and reutilization of CFC-12 from household refrigerators already in use and being repaired by FAEM and other small shops around the country, carrying out minor civil work modifications to prepare the factory for the new equipment which were to be brought and used in facilitating the switch from CFCs to non-ODS refrigerator production and the training of personnel on the use of this new technology.[43] The implementation of these measures contributed to the reduction of the amount of ODS circulating in the national territory.

[42] *Ibid.*
[43] *Ibid.*

2.2.3.4. Capacity Building as a Tool in Reducing ODS Emissions

Capacity building happened to be one of the privileged and effective tools used by the government of Cameroon in reducing ODS emissions. To achieve the objective of reducing ODS emissions, Cameroon resulted to the training of cooling technicians on methods of handling these chemicals so as to prevent their emission into the atmosphere. Aside cooling technicians, other actors such as environmental inspectors, ODS distributors and custom officers also benefited from capacity building programs. These capacity building programs were aimed at enhancing knowledge in respect to the ozone layer, knowing the different ozone depleting substances and how to identify them, methods of reducing ODS emissions etc.[44]

The Cameroon National Ozone Office has for long been the structure directly in charge with the implementation of the national ozone program as defined by the government in respect to the Montreal protocol. It is the link between Cameroon and the international ozone bureau. In other to reduce the amount of ODS entering the country in respect to the Montreal protocol, the Cameroon national ozone office had been training custom officers.[45] The coordinator of the Cameroon national ozone office revealed that, they were involved in the training of over 200 custom officers per year. These custom officers were trained on among others, how to use machines which were provided by the government in detecting ODS in Cameroonian ports and entry points. Chemicals like CFCs, methyl bromide, halons, carbon tetrachloride had been banned from Cameroonian soil. It was hence the responsibility of custom officers to make sure this measure was strictly implemented.[46]

Also, these customs assisted the Cameroon national ozone office in monitoring the imports of ODS into the country and collection of data. The Cameroon national ozone office made use of such data to measure the amount of ODS entering Cameroon, so as to judge the effectiveness of the countries ODS control policy. In sum, capacity building programs organized for actors in the cold chain sector, environmental inspectors, ODS distributors and custom officers has been greatly useful in promoting control over the quantity of ODS entering Cameroon, preventing the entry of unwanted substances, collecting important data on ODS, enhancing knowledge on the ozone problem and solutions, the careful handling and prevention of ODS emissions.

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[44] Togeuo Martean, 39 years, cooling technician, Edea (Mbanda Terminus), 21 April 2022.
[45] Fokam Roger, 77 years, retired custom officer, Kumba (Kossala), 29 August 2022.
[46] *Idem.*

2.2.3.5. Sensitizing the Population on the Negative Effects of ODS Emissions

In accordance with article 9(2) of the Montreal protocol, all parties were encouraged to sensitize their population on the negative effects of ODS emissions to the ozone layer. This explains why since its ratification, Cameroon took various measures aimed at creating awareness in the mind of Cameroonians on the necessity to protect the ozone layer. One of the methods through which information on the ozone layer was transmitted to the public was through radio and television broadcast.[47] To create this awareness via the media, the national ozone unit, in collaboration with the communication unit of MINEPDED produced documentaries. These documentaries educated Cameroonians on the ozone layer problem.[48]

Also, they provided information to the public concerning what actions were being taken by the government, in respect to the Vienna convention and Montreal protocol, to solve the ozone layer problem.[49] The transmission of messages on the ozone layer to the public were done through the Cameroon radio and television (CRTV), Vision 4 and Canal 2. In addition, newspapers in the country such as Cameroon Tribune were also used for public sensitization.

Oral and written sources agree on the fact that brochures, banners, T-shirts, caps, polos and posters were produced bearing messages concerning the ozone layer.[50] These brochures, caps and T-shirts were generously distributed to the public. This contributed to creating awareness in the public on the ozone problem. As for the posters and banners, they were placed at strategic locations in Yaounde. Due to the covid 19 pandemic, face masks and hand sanitizers were highly used in Cameroon. Authorities used this as an opportunity to spread messages about the ozone layer by producing face masks and hand sanitizers bearing messages about the ozone layer.

Sensitization activities were also extended to educational institutions. Secondary school students were educated on the ozone layer problem. Ozone clubs were also created in some schools and used as mediums to spread information to students.[51] Inter-school competitions were organized on the media.[52] Students competed on poem and essay writing on the ozone

[47] Report of the 33rd edition of the international day for the preservation of the ozone layer 2020, 2020, p.3-4.
[48] *Ibid.*
[49] *Ibid.*
[50] *Ibid*.
[51] Tamba Charles, 46 years, Biology teacher, Yaounde (Essos), 30 April 2022.
[52] Idem.

layer. Schools involved in such competitions included government high school Nkolbissong and bilingual high school Essos.

Furthermore, the United Nations general assembly made September 16 the international day for the preservation of the ozone layer. Cameroon annually joins the international community in celebrating this day. The celebration of this day in Cameroon is usually marked by a lot of activities such as sensitization. September 16, 2020 in Cameroon was celebrated under the theme “ozone for life: 35 years of protection of the ozone layer”. Aside this, Cameroon also celebrates the world refrigeration day annually on 26 June. Through all the above measures, the government was able to create awareness in the public on issues related to ozone layer protection.

This chapter was divided into two sections. The first section analyzed the objective of the Montreal protocol. Some selected provisions of the protocol were also examined. It ended by examining reasons for which Cameroon ratified this protocol. The second part mainly analyzed the application of this protocol in Cameroon. The formulation of national laws protecting the ozone layer, banning the import of equipment containing ODS, sensitization campaigns, ratification of all amendments to the Montreal protocol were among some of the measures taken by Cameroon as far as the implementation of the Montreal protocol was concerned. These analysis proved that the country made some considerable efforts in respecting the terms of this international environmental law. This brings us to study or examine the case of the Ramsar convention in the next chapter.

CHAPTER THREE

THE RAMSAR CONVENTION: OVERALL VIEW AND APPLICATION IN CAMEROON

Faced with many problems related to wetlands, Cameroon just like many other countries ratified the Ramsar convention on the protection of wetlands especially as waterfowl habitat. Oral and documented sources were unanimous on the fact that since the ratification of this convention by Cameroon in 2006, the country`s government had been multiplying efforts in other to ensure the effective implementation of the provisions of this international multilateral environmental law.[1] Chapter three is divided into two parts. In the first part, discussions are centered around some generalities about the Ramsar convention on the protection of wetlands. This includes elements such as aims and major provisions of the convention. The second part brings into lamp light some of the majors taken by Cameroon, in respect to the provisions of the Ramsar convention, to protect wetland ecosystems or ensure their sustainable management.

3.1. The Ramsar Convention on Wetlands of International Importance

This part of chapter three brings to lamp light some generalities about the Ramsar convention on wetlands of international importance especially as waterfowl habitat.

3.1.1. Aims of the Ramsar Convention

The official name of the Ramsar convention was the convention on wetlands of international importance, especially as waterfowl habitat. Its common name, the Ramsar convention was derived from the Iranian city of Ramsar where the convention was adopted on 2nd February 1971.[2] It was an intergovernmental treaty which provided the framework for international cooperation on wetlands as waterfowl habitats. After its adoption in 1971, the convention went into force in December 1975 upon its ratification by the seventh country, Greece.[3] One of the bodies established by the convention was the secretariat. It carried out the day-to-day management or coordination of everything related to the convention. It was based

[1] Kamga Jean Merxiel, 43 years, Sectary at center for African forestry research and development, Total Melen, 21 December 2021.
[2] USFWS, *Wetlands of international importance: United States participation in the Ramsar convention*, Washington D.C, USFWS, 1993, pp.2-4.
[3] S. Sharma et al, *Wetland conservation: current challenges and future strategies*, Hoboken, John Wiley and sons, 2021, p.19.

at the headquarters of the IUCN in Gland, Switzerland. The three aims of the Ramsar convention are as can be seen in the subsequent paragraphs.

3.1.1.1. To work Towards the Wise use of all Wetlands

Firstly, member countries to this convention had the obligation to take into account wetland conservation in their national resource planning process. They were also expected to promote the wise use of wetlands found within their national territories. By wise use, we mean the maintenance of the ecological characteristics which of course defines the wetlands functional value.

3.1.1.2. The Designation of Suitable Wetlands for their Inclusion in the List of Wetlands of International Importance and Equally to Ensure their Effective Management

Secondly, the convention called on all member countries to designate more wetlands for their inclusion in the list of wetlands of international importance. Countries which were aspiring to also join the Ramsar family were required to designate at least one wetland for its inclusion in the list of wetlands of international importance. The criteria for the selection of wetlands of international importance was clearly set out by article 2(2) of the Ramsar convention. According to this article, wetlands could have an international value based on their ecology, botany, zoology, limnology or hydrology.[4]

3.1.1.3. International Cooperation

Lastly, the convention aimed to promote international cooperation over trans-boundary wetlands, shared wetlands systems and shared species.[5]All these aims of the Ramsar convention could be summarized to one thing, the halting of the global loss of wetlands through wise use and management and the conservation of those that remain. The Ramsar convention applied to all wetlands, be they wetlands of national or international importance, natural or man-made wetlands. The table below makes a distinction between natural and man-made wetland types.

[4] FSJP, convention relative aux zones humides d`importance international particulièrement comme habitats de la sauvagine, paper retrieved from https://www.cameroun-traites-accords.com consulted on 07/02/2022 at 00 :22am.
[5] *Ibid*.

Table 3: Different wetland types and their examples

Natural wetlands	Examples	Man-made wetlands	Examples
Marine	lagoons, rocky shores, coral reefs	Salt exploitation sites	Salt pans, saline
Estuarine	Deltas, tidal marshes, Mangrove swamps	Water storage areas	Reservoirs, dams, Barrages etc.
Lacustrine	Wetlands associated with Lakes	Excavations	Mining pools, Borrow pits etc.
Riverine	Wetlands along rivers and streams	Ponds	Farm ponds, small tanks, stock ponds.
Palustrine	Marshes, swamps, bogs	Irrigated land	Rice fields

Source: Build from field research[6] (see footnote 6)

As of 2018, 170 nations were signatories to the convention. In addition, over 2323 wetland areas were inscribed on the Ramsar list of wetlands of international importance. From the onset, the treaty focused on the conservation of wetlands as the habitat of waterfowls. But with time, the treaty has broadened its horizon and covers all aspects of wetland conservation. Since its adoption in 1971, the convention has been modified by the Paris protocol in 1982 and by the Regina amendment in 1987.Every year, the anniversary of the Ramsar convention is celebrated on 2nd February to promote its mission.

3.1.2 Major Provisions of the Ramsar Convention

It's important to note that the convention on wetlands of international importance, especially as waterfowl habitat, is one of the conventions on biodiversity protection.[7] It is however different because it is the only convention which was designed to protect a particular ecosystem, wetlands. Another specificity of this convention is that it came into existence thanks to the efforts of three NGOs.[8] This is contrary to many other conventions which came into existence thanks to the actions of sovereign states.[9] Looking at the provisions of the original convention signed in 1971, one will normally believe that this convention was mainly designed

[6] Frankline Joseph, Assomo Sonia, Obaseh Colins, Vakunta Sidonie and Njo Rose, added to internet sources.
[7] Hassan Abdul, 51 years, Geography/Geology Teacher, Garoua (Bogou), 11 September 2022.
[8] Muzanni Aabid, about 48 years, Expert on environmental issues, Garoua (Bogou), 11 September 2022.
[9] *Idem.*

for the protection of wetlands for the sake of water birds.[10] This believe was true, but over time, the convention has evolved and its scope of activities has broadened.

In the mid-1990s, at the sixth conference of the parties, the focus of the Ramsar convention shifted from wetland protection for the sake of water birds alone. In 2002, the Ramsar convention started examining other issues such as climate change and wetlands, water allocation, integrated coastal zone management and the cultural value of wetlands. A close look at the recent amendments to the Ramsar convention shows that it has shifted from "wetlands for birds" to "water for people".

Water is one of the most critical environmental issues in Cameroon today. Many communities in the country still have limited access to water. Amendments to the Ramsar convention now protect wetlands for the sake of humans, and not just water birds alone as was the case before. This could perhaps, also be one of the reasons why Cameroon only ratified this convention in 2006. This is so because the convention now touched some real problems faced by the country. Over time, the convention has recognized the needs of communities living around wetlands, in relation to drinking water, food, transportation, hydropower etc.

Article two of the Ramsar convention called on parties to the convention to look within their territories and choose at least one wetland which was to be included in the list of wetlands of international importance. Such wetlands were to be chosen following certain criteria which included ecology, botany, zoology and hydrology. This article was aimed at selecting some wetlands which were to be protected by the international community. Even though a wetland was designated as an international wetland, this did not however terminate the right of the party in who`s territory the wetland was found, on the wetland.

Countries which had already included a wetland in the list of wetlands of international importance, had the right to include more of such wetlands into this list, Provided they respected the criteria for the inclusion of wetlands into the list. The boundaries of international wetlands could be increased or reduced depending on the interests of the states in whose country the wetland was found. Parties to this convention equally had the responsibility to conserve, manage and promote the wise use of wetland migratory stocks of waterfowls.[11]

Article 3 called on all parties to the convention to formulate and implement their own project in respect to wetland protection. This article made it clear that parties to the convention

[10] Nasser Mutaali, 41 years, Environmentalist, Garoua (Bogou), 11 September 2022.
[11] The Ramsar convention on wetland protection.

could not limit themselves to implementing the demands listed in the convention. They were encouraged to go beyond the demands of the Ramsar convention, but formulate and implement their own projects on wetlands. This was to be on the condition that such state formulated projects culminate to the protection of wetland areas. It was in respect to this that Cameroon was able to formulate and implement its own wetland conservation projects as will be seen in the second part of this chapter. Furthermore, this article made it mandatory for all parties to inform the Ramsar secretariat of any changes in the ecological character of any international wetland found within their territories.[12]

The above articles seem to show that the Ramsar convention was all about wetlands of international importance only. Many people seem to believe that this convention was formulated to protect only wetlands of international importance. Article 4 of this convention called on parties to conserve wetlands through the establishment of nature reserves on such areas, be they wetlands of international importance or not. This made it clear that wetlands which did not meet the criteria for their inclusion in the list of wetlands of international importance, also had to be protected from destruction. The government of Cameroon was also able to take measures in view of protecting wetlands of national value. Still based on this article, research, the exchange of data and actions in respect to wetland plant and animal life was encouraged. Parties were also encouraged to train personnel who were to be responsible for wetland research, management.

Article 5 encouraged cooperation between parties in the case of shared wetlands (trans-boundary wetlands) and water systems. This cooperation was to be aimed at regulating and conserving wetland plant and animal life.[13]

3.1.3. Reasons why Cameroon Ratified the Ramsar Convention

The government of Cameroon ratified the Ramsar convention on the protection of wetlands especially as waterfowl habitat on March 20, 2006. According to article 10(2) of the convention, it had to go into force four months after its ratification. This eventually took place on 20 July, 2006. The following factors explain why Cameroon decided to ratify the Ramsar convention on wetlands protection.[14]

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[12] *Ibid.*
[13] *Ibid.*
[14] F. Tazoacha, managing wetland ecosystems to guarantee water security in Cameroon, paper retrieved from https://www.ideasforpeace.org consulted on 03/02/2022 at 01:39pm.

3.1.3.1. Pre-colonial and Colonial Heritage

The protection of important ecosystems is far from being a tradition which began in the post-colonial era in Cameroon. Research has traced the genesis of resource management and protection to the pre-colonial era. The main actors of resource protection and management were the paramount traditional rulers or chiefs of ancient Cameroonian societies. These chiefs had control over every aspect of their society and this of course included the management of village natural resources. This therefore means that these chiefs had to ensure some level of rationality in the exploitation of forest resources surrounding their villages. Based on the above, it can be concluded without fear that this chiefs in their time had already understood the value of this natural resources and hence, the need to protect them.[15]

Moreover, the authority of these paramount traditional rulers started diminishing with the coming of the Germans and their subsequent annexation of Cameroon. This was so because after the signing of the famous Germano-Douala treaty of Saturday 12 July 1884, the Germans declared all natural resources in the territory as state property. The Germans went ahead to create natural reserves in the country with the first one being created in 1892. This happened to be the Limbe botanical and zoological garden found on the coastal wetland areas of Cameroon. Officially, forest administration began in Cameroon in the 1890s. The Germans proceeded to establish more protected areas and laws regulating the exploitation of these natural resources.[16]

After the defeat and exit of the Germans from Cameroon, Britain and France who took over the territory continued in the foot prints of the Germans as far as the protection of natural or forestry resources were concerned.[17] It should however be noted that even though these two powers continued and even improved on the protection of natural resources in the country, the real motives behind these actions remained a subject of debate between those who thought it was purely for the protection or conservation of biodiversity and those who believed mercantilist motives were behind these actions. All this makes it clear that since the pre-colonial era, Cameroonians societies had already understood the need to protect ecosystems who`s resources were beneficial to them. With the advent of Colonialism, Cameroonians learned from the colonial masters' new ways of protecting these natural resources. This explains why Cameroon after independence had been ratifying international conventions in relation with the

[15] Report on the evaluation of the monitoring of forest law enforcement in Cameroon, August 2016, pp.28-30.
[16] *Ibid.*
[17] *Ibid.*

protection of biodiversity, which includes the Ramsar convention on the protection of wetland ecosystems.

3.1.3.2. Threats Faced by Cameroonian Wetlands

According to a report from UNEP, the mangrove forest in Cameroon (one of the country`s major wetland types) for example had dropped from 272.000 hectares in 1980 to approximately 195.000 hectares in 2005.[18] Analyzing this data further shows that Cameroon lost 30% of its mangrove forest over a period of 25 years. This further implies that 2.500 hectares of mangrove was lost every year. This phenomenon could be explained by factors such as the fact that Africans in general and Cameroonians in particular have always conceived wetlands to be the homes of witches and wizards, mosquitos which cause malaria,[19] the home of diseases such as typhoid and cholera.[20] Based on this, it was evident that this kind of mentality could only lead to one thing, the destruction of wetland areas.[21] This accounted for the destruction of wetland areas in the Lebialem division, part of Mifi division and Menoua division. Elsewhere, in the metropolitan city of Douala, wetlands had continuously been threatened by the presence of companies making use of petroleum products. The table below depicts some of these companies who`s operation had for long constituted a threat to the Douala coastal area.

[18] Wetlands: our perspective, paper retrieved from https://www.erudef.org consulted on 03/02/2022 at 01:41pm.
[19] Bihtang Benezet, 31 years, nurse, Shisong, 04 February 2022.
[20] Y.B. Ngwangkfu et al, "Diseases and health: case of wetland populations in the Bamenda urban areas", *Journal of agricultural research and technology*, Vol 6, January 2019, p.16.
[21] Nzeh Betrand , 59 years, Wetland Farmer, Wum, 22 February 2022.

Table 4: Producers of petroleum products which destroyed wetlands in the Douala area.

Company	Product	Contaminant
CIAC and PLASTICAM	Producers of plastic buckets, paints and tyres	Hydrocarbons, tubes
SAPCAM	Paint production	Combustible fuel oils
CONFITEX	Textiles	Acid waste oils
TOTALFINAELF	Crude oil exploitation and marketing oil products	Hydrocarbons and lead
SCDP	Oil products storage and distribution	Oil dumps (contains lead, copper etc)
SHELL/TEXACO	Aviation, petrol, diesel fuel and wax	Hydrocarbons, lead, copper, zinc and other trace metals
CEP/Chemicals	Paints, detergents, vanish	Acid mercury, phosphates, copper, trace metals etc

Source: C.K. Asangwe, The douala coastal logone complex, Cameroon: Environmental Issues , paper retrieved from https://www.semanticscholar.org consulted on 04/02/2022 at 08:37pm.

The table above clearly shows the dangerous waste which were continuously released by this companies into the surrounding wetland areas of Douala resulting to their degradation or destruction. Generally speaking, despite their value, Cameroonian wetlands were faced by many threats both of anthropogenic and natural sources which include: intensive agriculture, urbanization, overexploitation of wetland resources, pollution, ignorance, native superstitious believes, climate change etc.[22] Conclusively, these threats faced by wetlands in the country also explain why the government of Cameroon decided to ratify the Ramsar convention in 2006 as an effort to protect wetlands in the country.

3.1.3.3. The Influence of Foreign Powers

It was also believed that environmental actions taken in Cameroon could also be explained by external factors. Nsana Lucie, a specialist in diplomacy from IRIC argues that environmental actions or policies in Cameroon were influenced by foreign powers. This could be explained by the fact that in international relations, stronger powers always had the tendency

[22] Even though climate change is caused by human activities such as the consumption of fossil fuels, deforestation etc, the phenomenon in its self however remains a natural phenomenon which has multiple devastating effects for both humans and the environment. In relation to wetland ecosystems, climate change has succeeded to win a place in the list of threats to wetlands ecosystems.

to impose their views or interest on the weaker ones. These international environmental actors, based on the fact that they provided a great part of the finances on which international organizations operated, were able to bend other nations to their will.[23] Cameroon had been unable to impose her own views in the international scene and rather adopted the policy of "Followership".

This means that Cameroon seldomly took decisions which could help her impose her own interests. She rather decided to align with the great powers in whatever they did. A good number of factors explained this phenomena. Moreover, we could deduce from all this that aside other factors, Cameroon was also influenced by international environmental actors to ratify the Ramsar convention on wetland protection. These foreign powers, most of whom were European and northern American countries formulated the Ramsar convention and provided the finances needed to apply the convention. The problem of wetland loss was not specific to any region of the world but was rather a global issue. There was therefore the need to bring in other nations, through various methods to ratify and implement this international environmental law.

3.1.3.4. Financial Advantages Associated with the Ratification of the Ramsar Convention

According to Besong Tagem, specialist in public finance and chief of records at MINFOF, one of the reasons why Cameroon ratified the convention on wetland protection especially as waterfowl habitat in 2006, was because there were financial benefits attached to it. Members of the Ramsar family benefited from funds which were disbursed to help this countries implement the Ramsar convention. Cameroon needed access to this finances in other to use it in protecting its biodiversity.[24]

3.2. Application of the Ramsar Convention in Cameroon

This part of the work seeks to show how influencial the Ramsar convention has been on wetland management or protection in Cameroon. We are going to clearly show how this convention reinforced former measures taken by Cameroon before 2006 in view of wetlands protection. Also, analysis will be made on other measures taken by the country after 2006 to properly manage or protect wetland ecosystems.

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[23] L.N Nsana, "La politique environementale du Cameroun à la lumiére de la coopération internationale : une analyse de l`influence des grands acteurs environnementaux globaux", Mémoire de master en Diplomacie, Université de Yaoundé II-IRIC, 2015, pp.1-20.

[24] Besong Tagem, 44 years, specialist in public finance and chief of records at MINFOF, Post central, 05 March 2022.

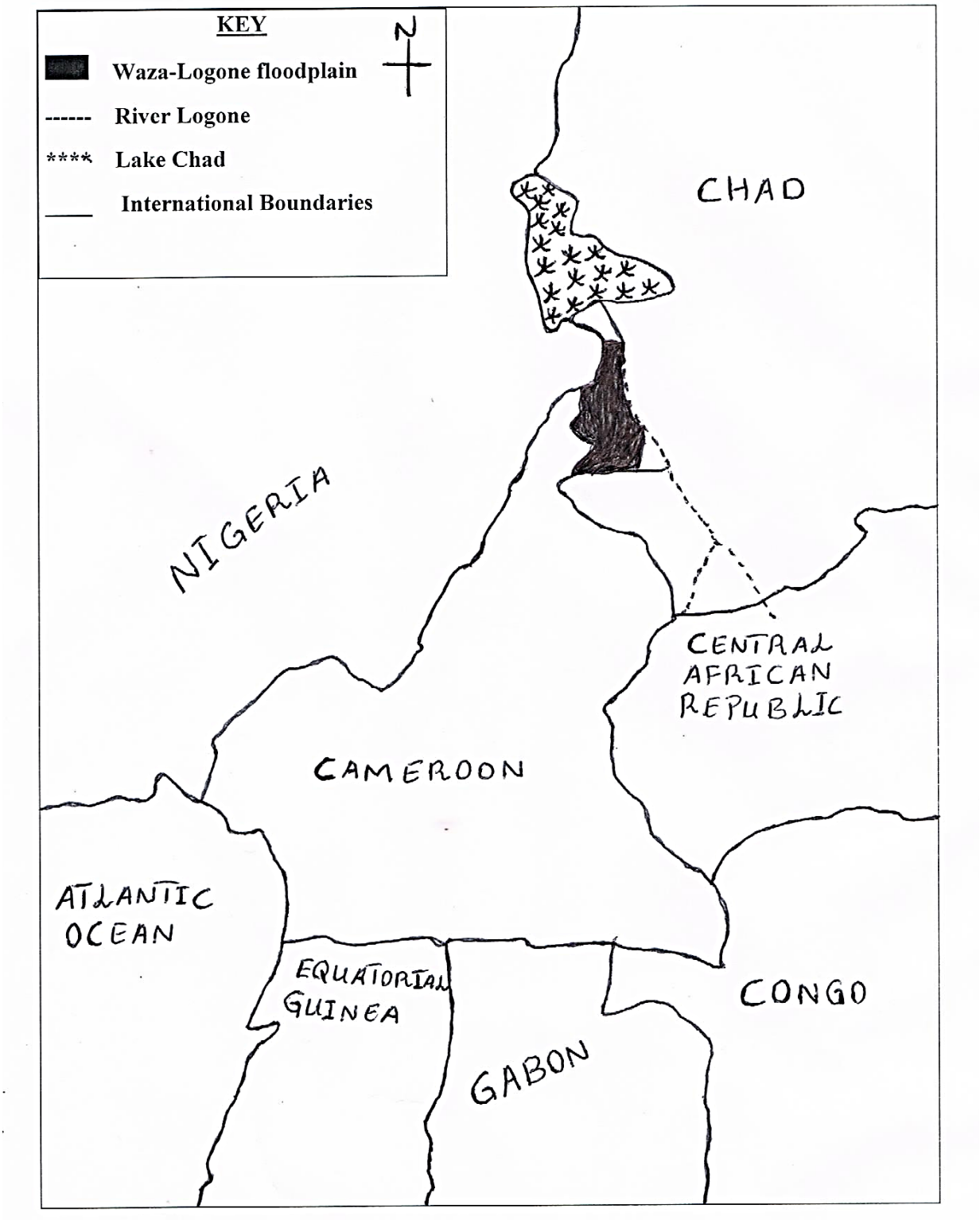
3.2.1. Designation of Wetlands of International Importance

Parties to the Ramsar convention or nations aspiring to integrate the Ramsar family were required to demonstrate their good will for wetland protection or their sustainable management. This was to be done through the designation of suitable wetlands which were to be included in the list of wetlands of international importance. These wetlands included in the list of wetlands of international importance were to be referred to as Ramsar sites[25]. In respect to article 2(1) and 2(2) of the Ramsar convention on wetland protection, Cameroon designated the Waza-Logone floodplain on March 20, 2006 to be included in the Ramsar list of wetlands of international importance. Remember that the Waza-Logone floodplain alone makes up 10% of the total surface area of wetlands in the West African Sahel region. The presence of two national parks, the Waza and Kalamalue parks, were the reason why rich wild life diversity could still be found in the Waza-Logone floodplain area in the Sahel region.[26]

It was estimated that the floodplain covered an area of 600,000 hectares. It is located in the Far North Region of Cameroon bordered by Nigeria to the west and Chad to the east.[27] Based on the above, it is clear that the commitment of Cameroon to implement the demands of the Ramsar convention was first materialized by the designation of the Waza-Logone floodplain to be included in the list of wetlands of international importance. This move was highly welcomed by the Ramsar bureau.[28] In the map below, all the area colored in black represents the Waza-Logone floodplain in the far north region of Cameroon.

[25] Atemkeng Judith, 50 years, specialist in environmental dynamics and risks, Shisong, 04 February 2022.
[26] IUCN, *The return of the water: Restoring the Waza logone floodplain in Cameroon*, Gland, IUCN, 2004, p.6.
[27] L. Emerton, *Values and rewards: counting and capturing ecosystem water services for sustainable development*, Gland, IUCN, 2005, p.43.
[28] J & P, Cameroon/Biodiversity conservation: Cameroon identifies new wetlands, paper retrieved from https://www.jumelages-partenariasts.com consulted on 16/02/2022 at 01:55pm.

Map 2: The Waza-Logone floodplain in the far north region of Cameroon.



Source: Adapted from https://www.researchgate.net/figure/The-Far-North-Province-with-Waza-Logone-area.

Over time, the country has been able to inscribe other wetlands into the list of wetlands of international importance. Presently, Cameroon has a total of seven recognised wetlands of international importance as can be seen in the table below.

Table 5: Wetlands of international importance in Cameroon.

Wetland	Surface area in acres	Date of designation as an international wetland.
Waza-Logone floodplain	1,500,000	20 March, 2006
Barombi Mbo Crater Lake	1,030	08 October, 2006
The Cameroonian part of River Sangha	15,000	02 February, 2008
The Cameroonian part of Lake Chad	31,000	02 February, 2010
Rio Del Rey Estuary	410,000	20 May, 2010
The Ebogo humid zone	7,650	06 May, 2012
The Cameroonian part of River Ntem	98,470	05 June, 2012

Source: Adapted from https://www.cameroonpostline.com/6-wetlands-of-international-importance-identified-in-cameroon consulted on 19/02/2022.

Despite the visible importance which the Ramsar convention attached to wetlands of international importance, we shouldn`t be brought to think that wetlands which were not in conformity with article 2(2) were not concerned by the Ramsar convention. As a matter of fact, the convention sought to protect all wetlands irrespective of their type (mangroves, deltas etc), value (national or international) and nature (natural or artificial). We can quickly deduce from the above that in Cameroon just like in many other countries, wetlands had been divided into national and international categories or values.

Wetlands of national value in Cameroon included the following: Songloulou, Maga, Edea, Lagdo, Douala, Kribi, Tiko, Mboh and Santchou plain, the coast of Limbe, Ndian creeks and the Ndop floodplain.[29] Aside all this, the protection of other smaller wetlands in sub-

[29] F. Tazoacha, Managing wetland ecosystems to guarantee water security in Cameroon, paper retrieved from https://www.ideasforpeace.org consulted on 19/02/2022 at 04:37pm.

divisions of Cameroon remains a major preoccupation in Cameroon till today. This could also explain why all wetlands were considered government property and so it was illegal for citizens to settle or carry out developments in such areas.[30] If citizens settle, carry out development or increase the value of a wetland area, then it was at their own risk because the government could displace them at any time without compensations.

National wetlands listed in the paragraph above were also being protected by both state and non-state actors in respect to the Ramsar convention. Managing these wetlands in a sustainable way remains a challenge in the country. The economic benefits from wetlands are enormous, it also provides possibilities of self-employment for many Cameroonians. Take the Ndop flood plain for example. The 13 villages which make up this area practice a common economic activity which is rice farming.[31] A small quantity of this rice is sold in Cameroon while a greater part is exported to neighboring countries like Gabon, Equatorial Guinea and Nigeria.[32] It was estimated that rice cultivation in the Ndop floodplain alone gave about 10 billion francs annually.

In the Kumba locality, wetlands have always been ideal for cocoa plantations. This was not only due to the moist soils but also due to the presence of a water sources from where water could easily be gotten for various activities in the farms.[33] Conclusively, the inscription of wetlands into the list of wetlands of international importance by Cameroon, in respect to article 2(1) of the Ramsar convention constituted a way of protecting these wetlands which had been given an international value.

3.2.2. Intensification of Cooperation on Trans-boundary Wetlands: Case of the LCBC

In accordance with article 5 of the Ramsar convention on wetland protection, Cameroon intensified its cooperation on trans-national wetlands with other countries and organizations. This was done with objective to protect and assure the sustainable management of these areas. However, it should be noted that inter-state cooperation to protect the water and natural resources in the Lake Chad area for example dates back to 1964 under the canopy of the Lake Chad Basin Commission (LCBC). Four different countries were the brain behind the creation of this organization and they included: Nigeria, Chad, Cameroon and Niger.[34] Based on this, it

[30] Lekeaka Vitalise, 31 years, CEO and founder of Solidarity Network for the Environment and Leadership (SNEL), Yaounde (Ngoa-Ekelle), 22 December 2021.
[31] Muandzevara Yusuf, 33 years, Ndop wetland farmer, Yaounde (Melen), 15 February 2022.
[32] Najeh Stephanie, 48 years, Ndop wetland farmer, Bamenda (Up Station), 07 February 2022.
[33] Chafack Nelson, 44 years, Wetland farmer, Kumba (Kossala), 27 December 2021.
[34] Njuku Charles, 42 years, geography teacher, Kumba (Kossala), 27 December 2021.

is clear that this commission was an intergovernmental organization created and charged with ensuring the sustainable and equitable management of Lake Chad, other shared water resources and the preservation of the fragile ecosystems in the area.[35]

The Republic of Central Africa joined the LCBC in 1996, Libya in 2008 while observer status was held by Egypt, Republic of Congo, Democratic Republic of Congo and Sudan. Presently, eight countries make up the Lake Chad Basin chosen based on their proximity to the Lake Chad. They include: Chad, Nigeria, Niger, Cameroon, Algeria, Libya, Sudan and Central African Republic. Fishing is one of the major activities practiced by the people who inhabit the Lake Chad basin. Also, fishing in this area is not reserved for men alone, women have been spotted actively taking part in fishing, they also sell and make a lively hood from fishing activities (see plate 3 below).

Plate 3: Fisherwomen in the Lake Chad area, 2022

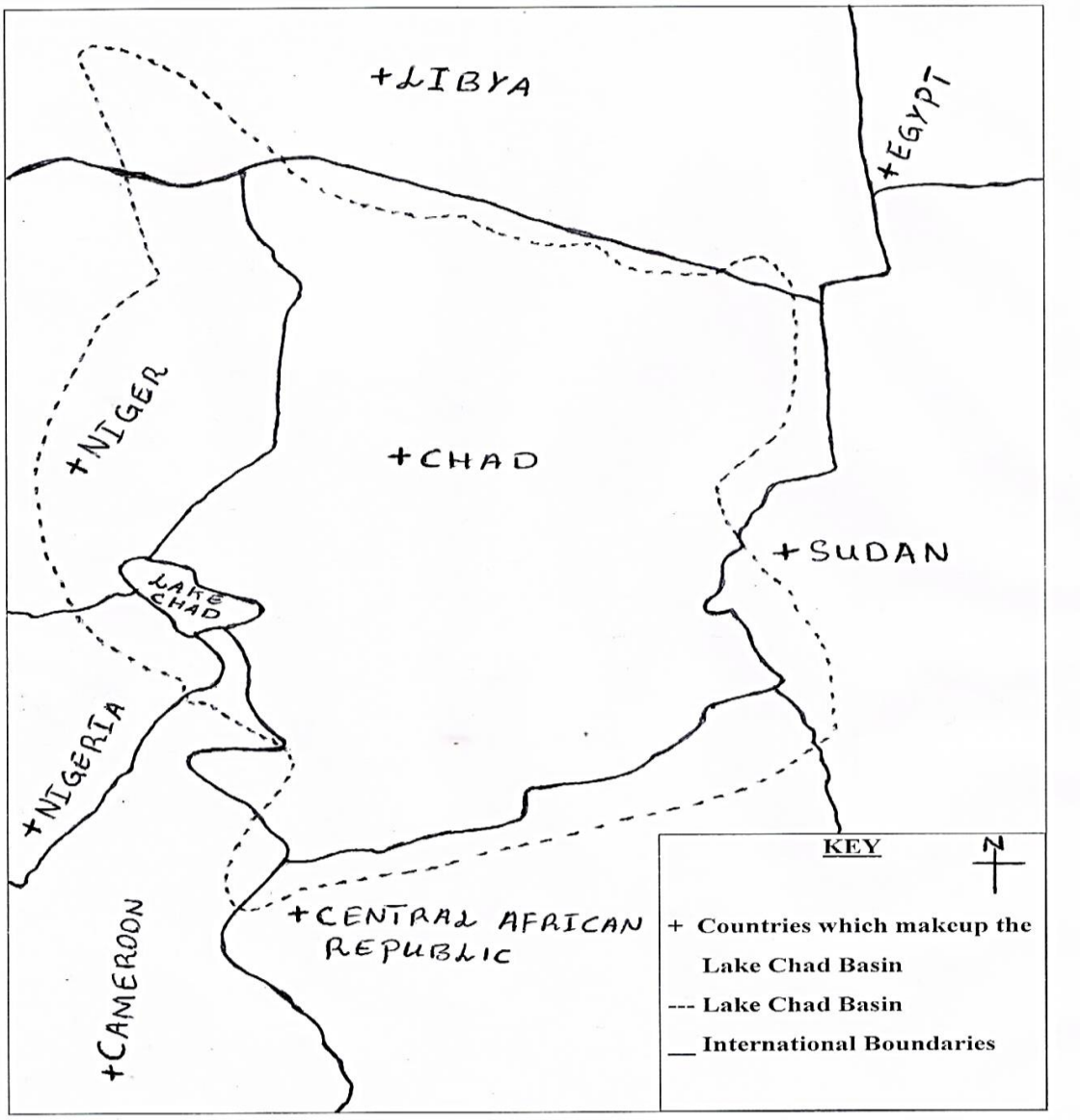
Source: https://news.un.org/en/story/2018/07/1014002 consulted on 23/02/2022 at 03:11pm

Looking at the riches of the Lake Chad and its environs, it becomes comprehensible why all these countries developed interest in it and put in place mechanisms to protect and assure its sustainable management.[36] It was estimated that 150,000 people lived on the shores

[35] *Idem.*
[36] Atangana Jean Paul, 51 years, Economist, Yaounde (CAMAIR), 21 February 2022.

of Lake Chad[37] and its islands and fish production in this area was estimated at 60,000 to 70,000 tonnes annually. The map below shows all the countries which make up the Lake Chad basin.

Map 3: Lake Chad and the eight countries which make up the Lake Chad basin.



Source: Adapted from https://www.google.com/search?q

The convention on wetlands protection, especially as waterfowl habitat, had great impacts on the LCBC as it brought in new steam and carried cooperation between member states to higher levels. As a matter of fact, In July 2000, a LCBC heads of state summit was held and an important outcome of this summit was the decision by its member countries to make the whole of Lake Chad a trans-boundary wetland of international importance. Some

[37] Lake Chad is made up of two basins, one in the north and another in the south. The two basins are separated by a shallow mid-section known as "the great barrier". River Chari is the main water inflow of the southern basin. The rest of the water in the Lake comes from rain fall and a good number of tributaries, including the El Beid River. The Lake`s water increases during the wet season and reduces during the dry season.

member countries of the LCBC after ratifying the Ramsar convention proceeded to designate their own portions of Lake Chad as wetlands of international importance.

It was under this context that Chad designated its own portion of Lake Chad in 2001 as a Ramsar site. Nigeria did same with her own part in 2008 and Cameroon in 2010. From this moment henceforth, cooperation to protect this trans-boundary wetland area became intense between member countries of the LCBC and other organizations such as: WWF, IUCN, GEF, the World Bank, UNDP etc. All these bodies worked in collaboration with the LCBC to help her implement the provisions of the Ramsar convention and assure the protection of the Lake Chad basin area.

In other to improve cooperation on the Lake Chad Basin, a memorandum of cooperation was signed between the bureau of the convention on wetlands and the LCBC.[38] This memorandum of cooperation had three key objectives which included: firstly, the maintenance of Lake Chad and other wetlands in the region in a sustainable way and provide economic security, secondly, to ensure sustainable biodiversity and the equitable use of water resources of the basin to reduce poverty, lastly, to guarantee the equitable access of all member states to save and adequate water resources in other to meet their needs and rights and accepting the responsibility of fresh water and biodiversity conservation and integrated basin management by both regional and national authorities.[39]

The acceptance of the Ramsar convention by member states of the LCBC resulted in the following: it increased understanding and cooperation between the neighboring countries which share the Lake Chad basin. It also intensified international cooperation between the LCBC and international NGOs, channeled GEF funding into pilot projects and management plans in the Lake Chad basin, increased cooperation among villagers and communities to establish laws and programs to protect the Lake, laid the groundwork for the LCBC to play the role of a local management body to govern shared resources, promote dialogue among member states and prevent conflicts and lastly, the provision of tools needed to raise the awareness of wetland values (e.g brochures, posters, maps etc).[40]

Cameroon had to work with other members of the LCBC in tackling some problems faced by the Lake Chad Basin. These problems included: population growth, flooding,

[38] D. Shondell et al, *Comparative emergency management: examining global and regional responses to disasters*, Florida, CRC Press, 2011, pp.137-138.
[39] *Ibid.*
[40] *Ibid.*

agriculture and climate change which were a threat to this wetland area. These problems raised the need for the appropriate management of water resources and soils in the Lake Chad Basin. After the ratification of the Ramsar convention by LCBC member states including Cameroon, some projects were jointly implemented to tackle these problems. An exemplary case was a project referred to as Applied Water Resource Management in the Lake Chad Basin. This project was however not the brain child of the LCBC, but it was adopted and executed by the LCBC.

This project which was implemented as from 2019, had as aim to ensure food security, climate change adaptation and to resolve conflicts which were ongoing in the area. As a result of this project, about 1,250 farmers were given seeds, training on climate change adaptation and also given agricultural materials, employees of the LCBC were trained as trainers in the use of Lake Chad information system, household surveys were conducted in Chad and Cameroon and this enabled the measurement of increase in income and climate change adaptation measures etc.

Before the above, another project had been implemented by the LCBC beginning 2008. The aim of the project was to guarantee food security in Cameroon, Chad, Niger and Nigeria. By extension, the project wanted to reduce threats to food security such as weed and crop diseases, harmful insects on crops like sorghum and millet.[41] The project stimulated an improvement in regional coordination to combat crop destroying pests in the member states of LCBC.

In conclusion, the above discussions clearly shows that in obedience to article 5 of the convention on wetlands protection, especially as waterfowl habitat, Cameroon just like other member states of the LCBC, since its ratification of the convention on wetlands has intensified international cooperation on trans-boundary wetlands in an effort to ensure that biodiversity or wetland resources are protected and managed sustainably.

3.2.3. Other Measures Taken to Implement the Ramsar Convention in Cameroon

The convention on wetlands protection, especially as waterfowl habitat as earlier mentioned authorized member states in its article 3(1) to formulate or come up with their own plans or projects. This was to be done provided these projects fell in line with the objectives of the Ramsar convention. In respect to these, Cameroon was able to come out with the following

[41] Report on the Multinational Lake Chad Basin Commission (LCBC): pilot research/development support project on integrated pest management for subsistence farming in the Lake Chad Basin, 2008, p.6.

actions all aimed at protecting wetlands all over the country and ensuring their sustainable management.

3.2.3.1. Creation of the National Ramsar Committee

Still in an effort to ensure the effective application of the Ramsar convention on wetlands protection, Cameroon created the National Ramsar Committee. It was on March 8, 2007 following prime minister Ephraim Inoni`s ministerial degree N^0 63 of 8^{th} March 2007 that the government officially made it public. The Ramsar National Committee was created within the Ministry of the Environment, Nature Protection and Sustainable Development (the Ramsar administrative authority in Cameroon).

Structurally, the committee was composed of the following:

A president

The minister in charge of the Ministry of the Environment, Nature Protection and Sustainable Development automatically became the president of the National Ramsar Committee. In case he could not assume this responsibility, he was represented. Other members of the National Ramsar Committee include: one representative from the ministry of agriculture, one representative from the ministry of tourism, one representative from the ministry of economy and finance, three representatives of the ministry of environment, nature protection and sustainable management, one representative from the ministry of water and energy, one representative from the ministry of scientific research, one representative from the ministry of external relations, one representative from the ministry of fisheries and animal husbandry, one representative from the ministry of town and country planning, one representative from the ministry of forestry and wildlife, one representative of a national non-governmental organization and one representative of an international non-governmental organization.[42]

All these representatives were designated by their respective organizations. A technical secretariat was also put in place to assist the National Ramsar Committee in accomplishing its goals. This committee was created with main objective to assist the government in its mission to coordinate and follow up the implementation of the Ramsar convention in Cameroon. Its specific objectives included: the designation of wetlands to be included in the list of wetlands of international importance and to ensure the management of designated Ramsar sites and other

[42] Arreter N^0 063/CAB/PM du 08 Mars 2007 portant création du comité national Ramsar sur les zones humides du Cameroun.

Ramsar related issues, under the supervision of the minister of the environment, nature protection and sustainable development.[43]

This committee was financed by the government of Cameroon, secretariat of the Ramsar convention and the National Fund for the Environment and Sustainable Development. This committee since its creation has actively ensure the protection of wetlands in Cameroon. It stands out as a back-bone, as far as wetland protection and sustainable management is concerned in Cameroon.

The Ramsar committee has always acted as the middle man between the government of Cameroon and international Ramsar bureau. In other to ensure maximum protection for wetlands, this committee worked in collaboration with experts on wetland issues. There was also intense collaboration between the National Ramsar Committee and competent external organizations. The Ramsar committee has always closely monitored the evolution of wetlands in the country. This was accomplished through the use of experts who carried out studies on wetland ecosystems in the country and reported back to the Ramsar committee who intern transferred this data to policy makers.[44]

It should be noted that the National Ramsar Committee was not a decision making body. This affirmation is made based on the fact that the committee took no major decisions in respect to wetland issues. Policy makers in the country were the ones in charge of taking decisions based on data provided to them by the National Ramsar Committee. Aside carrying out research and reporting on wetland conditions in the country, the Ramsar committee was also in charge of implementing all government decisions in respect to wetlands.[45]

The committee was also involved in carrying out sensitization campaigns aimed at creating awareness on wetland issues. It also worked in collaboration with the Ministry of Forestry and Wildlife on wetland reforestation projects. The committee launched a project known as “Project Mangrove” which is currently ongoing, and coordinated by the committee. It has taken measures to prevent citizens from exploiting wetland resources in a way which could cause harm to these areas.[46]

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[43] *Ibid.*
[44] Ndongo Barthélémy, about 66 years, the Ramsar focal point, Yaounde (MINEPDED/Post Centrale), 18 May 2022.
[45] *Idem.*
[46] *Idem.*

Parties to the Ramsar convention had to include as many wetlands as possible into the list of wetlands of international importance. This was another job of the National Ramsar Committee. There were certain conditions which had been set by the Ramsar convention based on which wetlands could be included into the list of wetlands of international importance. Remember that according to article 2(2) of the Ramsar convention, these wetlands were selected based on ecology, botany, zoology, limnology or hydrology. The National Ramsar Committee conducted research in the country to select wetlands which met these conditions and worked towards their inclusion into the list of Ramsar sites. It's thanks to this that Cameroon can today boost of having seven wetlands included in the list of wetlands of international importance.

The National Ramsar Committee presently has the ambition to include more wetlands into the list of wetlands of international importance. To this effect, this committee has conducted more research and came out with six additional wetlands which it is currently working to also include them into the list. If this is achieved, it will raise the number of Cameroonian wetlands in the list of wetlands of international importance to thirteen.

Furthermore, the National Ramsar committee was in charge of representing Cameroon in international meetings related to wetlands issues. The Ramsar focal point[47] was always at the head of the Cameroonian delegation to such meetings. The next meeting on wetlands will be in November 2022 in China. In preparation for this meeting, the Ramsar committee is currently updating its data on the seven existing international wetlands and the six others which are in the process of being included into this list.

In sum, the National Ramsar Committee worked in collaboration with an army composed of wetland experts, geographers, climate change experts, ethnographers and consultants. This team worked together in ensuring the preservation of wetlands included in the list of Ramsar sites. She acted as an adviser to policy makers and implemented all decisions taken in relation to wetland protection or implementation of the Ramsar convention. Through various measures, it limited human encroachment into major wetlands, thereby preserving their ecosystems. The National Ramsar Committee could be perceived as the wetland police or bodyguard of Cameroon.

[47] Note that the term "Ramsar focal point" is used to refer to the director in charge of wetland protection in Cameroon.

3.2.3.2. Sensitization and Education

Generally, the government of Cameroon used sensitization as a tool to promote rational environmental exploitation. Environmental sensitization refers to the motivation of people to take part in the promotion and management of the environment so as to improve living conditions. This developed an environmentally responsible attitude in people towards the environment. Through sensitization and education, the knowledge of people in respect to the environment modified, including their opinions and attitudes. The sensitization and educational strategy of the government revolved around the following: the media (this was done using the radio, television and newspapers), the inclusion of environmental topics in school syllables and lastly, face-to-face discussions between administrative authorities and the local populations on environmental issues.[48]

In respect to wetland protection via sensitization, it was observed that the state and non-state actors in Cameroon mostly went for face-to-face discussions. Such discussions revolve around the necessity to protect these fragile ecosystems.[49] The state did this in the logic that the more Cameroonians were educated on the strategic values of wetlands, the more they would refrain from acts which led to the degradation or destruction of wetlands. The good will of the government of Cameroon to effectively implement the Ramsar convention on wetland protection motivated her to embark on sensitization and educational campaigns.[50]

During these campaigns, special focus was made on citizens who made a living from agricultural activities.[51] They were known to be ever present on wetland areas due to the availability of water and rich soils suitable for agricultural activities. According to the minister of the environment, nature protection and sustainable development, farmers were front liners of wetland destruction via intensive agriculture, the use of fertilizers and chemical products which polluted these wetland areas.

From October 25 to November 5 2021, sensitization campaigns were launched on the banks of the Benue River, a wetland area in northern Cameroon. This was to protect this wetland area from the advancement of the desert by stopping practices such as abusive tree cutting and

[48] MINEF, File N^0 07.01.72, Programme de sensibilisation et d`education en matiere d`environnement au Cameroun, 25 November 2000, pp.56-58.
[49] Obaseh Colins, 33 years, geography student/researcher at the university of Buea, Buea (Mile 17), 01 March 2022.
[50] Enow Benjamin Morock, 36 years, geography student/researcher at the university of Buea, Buea (Mile 17), 01 March 2022.
[51] Belky Salley, 31 years, Wetland Farmer, Wum, 19 September 2022.

bush fires. During these sensitization campaigns, 16 villages were touched in the area and an estimated 823 people were sensitized. Three radio stations were also used in sensitizing the people on the need to halt abusive deforestation and bush fires in the area. This sensitization campaigns were carried out by MINEPDED, in collaboration with GIZ. The plate below clearly shows MINEPDED personnel sensitizing the populations who live on the banks of River Benue.

Plate 4: MINEPDED team sensitizing people who inhabit the banks of the Benue River, 2021

Source: https://www.facebook/minepded.com consulted on 01/03/2022 at 04:01pm.

Also, there are currently three main mangrove areas in Cameroon covering a total area of 395, 185 ha. They include: Rio Del Rey Estuary, Cameroon estuary and the mouth of the Nyong, Lokounje and Ntem Rivers. Mangroves provide biomass, forest products, contribute to sustainable fishing and are rich in biodiversity. Due to natural and anthropogenic factors, mangroves had been declining by -7.9% annually according to MINEPDED. Faced with this, sensitization stood out as one of the privileged tools of the government to halt the loss of mangrove forest in the country.

Furthermore, the celebration of international wetland day by Cameroon also constituted an opportunity used by the government to sensitize and educate Cameroonians on the need to protect or limit human damages on this areas. The world wetland day is celebrated on February 2 every year. In 2020, this day was celebrated at the Lake Ossa in Dizabgue (Littoral region)

under the theme "Biodiversity and wetlands".[52] The government of Cameroon through sensitization and education was able to integrate local communities in her wetland protection operation and limited the destruction of these areas. In 2018 for example, the government called on people recovering wetlands in the Yaounde VI council area to stop such ecologically unfriendly practices. The minister of MINEPDED visited the area to see the destruction caused by inhabitants (see plate 5). He also called on the population to halt the destruction of wetlands.

Plate 5: The minister of MINEPDED, standing between the two men with an insignia round their waist, heading a delegation to the Simbock wetland area in March 2018

Source: Photo taken by Ntungwe Ngalame, Simbock, March 2018.

The plate above shows minister Hele Piere and local council authorities visiting occupied wetlands in the Simbock area in Yaounde. The minister used this occasion to express his discontent with the inhabitants in respect to the destruction they had caused on this wetland area. This created awareness in the people in respect to the importance attached by the state to these areas.

3.2.3.3. Decentralization of the Fight for Wetland Protection to Councils

Another remarkable measure taken by Cameroonian authorities to implement the Ramsar convention at the national level, was the decentralization of wetlands protection to councils. The constitutional law of Cameroon of 18 January, 1996 enshrined decentralization

[52] MINEPDED, Journée mondiale des zones humides (JMZH) edition 2020, paper retrieved from https://www.minepded.gov.cm consulted on 01/03/2022 at 05:08pm.

as a primary or fundamental principle in the organization of state governance. Based on this, the government made it a priority to transfer a good number of powers to local authorities. This was done in other to boost local management in the country. This local authorities represented the state in their various localities. They also implemented the vision of the state in their areas of command.[53] There are presently 374 councils in Cameroon. These consist of 14 city councils and 360 municipal councils headed by a mayor and councilors who are elected. Regional, council and traditional authorities all have environmental competencies in Cameroon. However, the powers given to traditional authorities in respect to environmental issues is very limited. This is so because they mostly intervene in matters relating to water and pasture.

In other to ensure an effective implementation of the Ramsar convention on wetland protection, the government of Cameroon decided to transfer powers to councils in 2015. This powers were to enable councils manage and protect wetlands found in their various localities. According to degree N^0 2015/1373/PM of 8 June 2015 to lay down rules for exercising some powers transferred by the state to councils on the environment, councils all over the national territory were responsible for the protection of wetland areas. Since these councils as earlier mentioned represent and implement the vision of the state in their localities, these transfer of powers therefor reinforces government control over wetland areas through local councils.[54]

The 2015 degree passed by the prime minister of Cameroon at that time, Philemon Yang, charged councils with the responsibility to: protect ground water and surface water resources, develop and implement wetland programs, prevent the drainage or conversion of wetlands for agricultural and town planning purposes, restrict certain agricultural practices in marshy areas, prevent the loss of biodiversity in aquatic ecosystems, particularly in coastal areas and in continental lake basins and rivers, and monitor the factors which led to wetland destruction.[55]

These councils were also called upon to make use of the technical staff of MINEPDED to carry out the duties assigned to them in the domain of wetlands. Since 2015, councils in Cameroon have embraced and applied these laws or powers which were financed by a special budget included in the council`s budget.[56] As a matter of fact, councils through this degree helped the government by ensuring the implementation of the Ramsar convention in all parts

[53] G.Y. Yombi et al, *Decentralized territorial communities and implementation of public policies: The case of Cameroon*, London, Intechopen limited, 2019, pp.1-2.
[54] Degree N^0 2015/1373/PM of 8 June 2015 to lay down rules for exercising some powers transferred by the state to councils on the environment.
[55] *Ibid.*
[56] *Ibid.*

of the country. Such measures obey article 3 of the Ramsar convention and interprets the government's good will in ensuring that the Ramsar convention on wetland protection was effectively applied in Cameroon.

Still in respect to the 2015 law, councils tightened their control over wetland areas. People who were found guilty of polluting or carrying out any project which threatened the existence of wetland ecosystems, were convoked and fined. Individuals were continuously reminded that wetlands were owned by the state and so individuals were not free to modify in any way, these natural environments. Councils were able to put in place certain measures to limit human encroachment into wetland areas. In the Nkor council found in Noni subdivision, Bui division, the rapid increase in population led to greater human encroachment into natural ecosystems, notably wetlands.[57] These wetland areas were mainly used for agricultural activities and house construction. Pollution was equally another problem faced by wetlands in the area. Lots of measures were taken by this council area to mitigate problems related to wetland deterioration, among which figures the organization of workshops for sensitization.[58]

3.2.3.4. Reforestation of Mangroves

Mangrove forest in Cameroon are the sixth largest in Africa and first in central Africa. The country also has one of the most giant mangroves in the world. These mangroves are found in areas like Rio Del Rey and Ntem estuary, Tiko, Wouri estuary, Douala, Sanaga estuary etc. Mangroves happen to also be places where fishes lay eggs and reproduce. They are a good source of food for people and shelter for sea life. They also help to curb coastal erosion by reducing the power of tidal waves. However, local experts in Cameroon have confirmed the fact that the state of mangrove forest in the country were deplorable.[59] This was due to destructive practices carried out on these wetlands by Cameroonians.[60] Studies revealed that wood from mangrove forest were being destroyed for the production of canoes, making fire for fish smoking (MINFOF in other to limit deforestation in this wetland areas provided these fisher men with refrigerators for fish conservation)[61], making furniture and art tools. In 2018, it was estimated that the mangrove forest of Cameroon had degraded by 75%.

[57] Abu Simon, 53 years, Farmer, Bamenda (Meta Quarter), 11 January 2022.
[58] Fah Georgino, 39 years, Farmer, Bamenda (Meta Quarter), 11 January 2022.
[59] Anonymous.
[60] *Idem.*
[61] Besong Tagem.

Also, another factor which stood as a threat to mangrove forests was the increase migration of people to coastal areas (Douala, Limbe, Tiko, Kribi). Consequently, mangroves were being cleared down faster than they could regenerate. After the ratification of the Ramsar convention, Cameroon had the responsibility to limit the destruction of mangroves in the country. To attain this objective, the government of Cameroon teamed up with some non-state actors with whom she cooperated to safeguard the country`s surviving mangroves and restore depleted areas. The government has actively been involved in mangrove reforestation projects just as was the case in 2011. But she was aided by private bodies who had also been involved in reforestation projects on wetlands in the country.

This state-private initiatives explains why there is a lack of accurate statistics in respect to the number of trees planted so far. Nevertheless, in the coastal communities of Libock, Nguimbock and Bopo, 68000 trees were planted within three years with a 70% success rate. In 2017, the coastal villages of Sanaga, Pouma, Dibamba were reforested with a 65% success rate.[62] Through the actions of both state and non-state actors, Cameroon has been able to implement the Ramsar convention on wetland protection through the protection and reforestation of mangrove forest in coastal areas.

3.2.3.5. The Role of Non-State Actors

Non-state actors in and out of Cameroon played a considerable role in helping the government with the implementation of the Ramsar convention.[63] These non-state actors included NGOs and private individuals. Some worked in collaboration with the government while others worked independently.[64] Their actions were geared towards the protection and sustainable management of wetlands in the country. Through their various projects and activities, they contributed in implementing the Ramsar convention in Cameroon. Examples of these non-state actors included: Cameroon Mangrove Network (CMN), Cameroon Wildlife Conservation Society (CWCS), World Wide Fund for nature (WWF), the civil society, Zoological Society London (ZSL) etc.[65]

In 2010, CMN launched a wetland reforestation project which culminated with the planting of 3000 mangrove trees in the Campo beach area. This project was born due to an

[62] B. Aurore, Cameroon`s mangroves could vanish without action, paper retrieved from https:www.aa.com.tr consulted on 09/03/2022 at 11:18pm.
[63] Tambe princewill, 42 years, forest guard, Douala (Akwa), 11 March 2022.
[64] *Idem.*
[65] *Idem.*

assessment made on the vulnerability of mangroves and associated ecosystems to climate change. This NGO worked in collaboration with the government of Cameroon. Its main objective was to help the government ensure the sustainable management of mangrove forest ecosystems.[66] The CWCS on its part also happened to be another non-state wetland management body in Cameroon. This organization influenced the government of Cameroon to ratify the Ramsar convention in 2006. Its actions were concentrated mostly in the coastal areas of Cameroon. It assisted the government in protecting and managing wetlands found on the coast of Cameroon.

The Zoological Society of London (ZSL) in collaboration with many partners in Cameroon were at the genesis of a project known as "Our Lake, Our Life". The project was launched in 2014 with aim to address threats to the Lake Ossa wildlife reserve which happened to be a wetland area. Illegal poaching and unsustainable fishing had put this wetland ecosystem at risk. The target of the project was to bring together different partners and local communities in a participatory approach. This was in other to come out with a co-management plan for the Lake. The project approach was to learn by doing and 11 villages were involved in the project. These communities were involved in activities like Lake clean ups, tree planting etc. By so doing, the project was able to limit threats faced by the wetland area. It also succeeded to involve the local communities in the protection and management of the Lake.

This chapter centered on the implementation of the Ramsar convention in Cameroon. Several reasons such as external influence, lessons learned from the pre-colonial and colonial era, financial benefits explained why Cameroon ratified the Ramsar convention. The main aim of the convention was to ensure the protection and sustainable management of all wetland areas irrespective of their value, type nor whether they were man-made or natural. Since the ratification of this convention, Cameroon took certain measures to ensure its implementation. All these measure were geared towards the protection and sustainable management of wetlands. These measures were in conformity with the main objective of the Ramsar convention. Some of these measures included the reforestation of mangroves, designation of wetlands of international importance, creation of the National Ramsar Committee, sensitization and education etc. These measures are just a few among the many actions taken by Cameroon to implement the Ramsar convention. However, non-state actors also played a great role in implementing the Ramsar convention through their various activities and projects. The next

[66] *Idem.*

chapter brings to lamplight certain weaknesses observed in the implementation of the Montreal protocol and Ramsar convention as well as how these weaknesses could be overcomed.

CHAPTER FOUR

THE MONTREAL PROTOCOL AND RAMSAR CONVENTION: WEAKNESSES AND REMEDIES

As already mentioned in the previous chapters, Cameroon ratified the Montreal protocol and Ramsar convention in 1989 and 2006 respectively. Many measures were adopted and implemented in accordance with the demands of these two IEL. Such measures included international, national, institutional, judicial measures and others. Indeed, the impacts of these IEL still remain perceptible in the country till today. They brought a plus to the environmental policy of Cameroon. In addition, they served as a guide in their specific domains as far as environmental management in Cameroon was concerned. Cameroonian efforts to implement these IEL received national and international recognition. However, despite some brilliant performances achieved as far as the implementation of the Montreal protocol and Ramsar convention were concerned, this chapter exposes to lamp light some weaknesses observed in respect the implementation of these international environmental laws. Furthermore, it includes proposed solutions which if adopted and applied, could help policy makers overcome such weaknesses.

4.1. Weaknesses Related to the Application of the Montreal Protocol in Cameroon

In this part of the study, analysis are centered on some shortcomings observed as far as the implementation of the Montreal protocol was concerned in Cameroon. It further proposes solutions which could be instrumental in addressing the shortcomings identified.

4.1.1. Judicial and Institutional Weaknesses

In other to implement the Montreal protocol, Cameroon proceeded by putting in place laws.[1] These laws were national laws aimed at protecting the ozone layer. Such laws included Decision N^0 985/MINDIC/CAB of 15 October 1996. This law banned the entry into the country of equipment and appliances containing ODS.[2] In the same vein, we can talk of Degree N^0 2011/2582/PM of 23 August 2011. This degree was passed by Prime Minister Philemon Yang on the 23rd of August 2011.[3] Under chapter 2, article 4 sub-section 3, CFCs were classified as controlled substances and by extension, they were considered as atmospheric pollutants. The

[1] Fruh Rolins Njong, 39 years, Air conditioner installer, Limbe (Bonadikombo), 10 May 2022.
[2] Decision N^0 985/MINDIC/CAB of 15 October 1996 banning the importation of appliances and equipment making use of substances which deplete the ozone layer.
[3] Degree N^0 2011/2582/PM 23rd August fixing the modalities for the protection of the atmosphere in Cameroon.

emission of such substances into the atmosphere was made illegal, especially when such emissions happened to be above the authorized limits.

In addition to these laws, custom officers and environmental inspectors received training on the control of illegal ODS importation into the country. Also, environmental control posts were created by the government at the entry points of the country. This was done in other to halt the illegal entry and circulation of products or equipment containing ODS. In sum, all the above mentioned measures were geared towards protecting the ozone layer by preventing the entry of ODS or substances containing them such as air conditioners refrigerators and freezers. This measures are just a few among the many measures which were adopted and implemented by policy makers of the country as we saw in chapter 2. Based on this, it's logical to ask the following question, did these laws and other measures produce the expected results?

Despite the good efforts and visible good will of policy makers to protect the ozone layer by preventing the entry of ODS or equipment containing them, realities in the field have a different story to tell. According to studies carried out by Paul-Joel Kamtchang, Ronel Tedeffo and personal research on the issue, it was concluded that despite all the laws put in place to control and prohibit the entry and circulation of equipment containing ODS, these equipment still managed somehow to find themselves in Cameroonian markets and homes. This means that it`s still possible to find refrigerators and freezers containing ODS in Cameroonian markets, shops and homes. These refrigerators were imported from countries like Germany, Belgium, France, USA, Canada etc. They are mostly second handed refrigerators for which African countries in general provide a good market.[4] In Yaounde, such shops are concentrated around the Obili area and many others can be found at various points of the city, In Douala, they can be found along the street known as Equinoxe and in Bonaberi.[5] Plate 6 below shows second handed imported refrigerators which are unfriendly to the environment, in a shop.

[4] Ewale Ewamba, 38 years, trader in second handed refrigerators, Limbe (Bonadikombo), 10 May 2022.
[5] Research has shown that shops dealing in the trade of second handed refrigerators containing ODS can be found in Cameroonian cities, present at various streets and this business turns out to be profitable for those involved, Prices of these second handed refrigerators range from around 90000 to 250000 FCFA or even more.

Plate 6: Imported second handed refrigerators containing gases dangerous for the ozone layer, 2022

Source: https://www.datacameroon.com/cameroon-prohibited-by-law consulted on 10/05/2022 at 05:28pm

Notwithstanding the fact that laws exist in Cameroon which regulate the importation of second handed appliances into the country, such practices still continued in disorder under the watchful eyes of those charged with ensuring the application of these laws.[6] At the ports, custom officers sometimes deem it more important to focus on collecting custom clearance fees.[7] This is done at the expense of ensuring the effective implementation of laws forbidding the entry of ODS or equipment containing them. Research revealed that Cameroon also imported refrigerators which were 20 years old.[8] Such practices happened to be environmentally unfriendly. As we can already imagine, this is because these old second handed refrigerators contain substances which deplete the ozone layer and are also dangerous to human health. Such

[6] Efafa Oliver, 42 years, trader in second handed refrigerators, Limbe (Bonadikombo), 10 May 2022.
[7] *Idem.*
[8] P.J. Kamtchang et al, Cameroon: prohibited by law, but in practice allows the import of hazardous gas refrigerators, online article retrieved from https://www.datacameroon.com consulted on 10/05/2022 at 05:28pm.

substances include Freon. When exposed to the sun`s rays, Freon transforms into chlorine and fluorine, two substances very dangerous for the ozone layer and human health.[9]

Some traders admitted being aware of the fact that, gases contained in the cylinders of these second handed refrigerators were environmentally unfriendly. Nevertheless, they choose the option of making money via the sales of such unecological equipment. According to them, it was the only source of income they had which permitted them to feed their families back home.[10] After use, people disposed these ODS contained refrigerators without taking any precautions to prevent the escape of the gasses it contains, into the atmosphere. At times, such refrigerators could be seen abandoned beside houses or thrown in bins. To make matters worse, when scrap dealers got these refrigerators, they braked it up to recover the scrap metal in them. In the process of doing this, the dangerous gases found in these refrigerators were liberated into the atmosphere.[11]

Article 17 of law N^0 2016/004 of 18 April 2016 governing foreign trade in Cameroon, stipulated that "imported or exported products are subject to governmental control. They may also be subject to technical controls".[12] Second handed refrigerators entering the country pass through governmental departments, this includes customs, environment and trade. However, their components and quality are most often not examined. Furthermore, they did not undergo the technical controls previewed by the laws in force. This is to say in simple terms that in Cameroon, the control on ODS or equipment containing them are not very effective. By extension, the demands of the Montreal protocol are not effectively applied by the administration. Many refrigerator technicians also made it known that, a highly dangerous refrigerant for the ozone layer known as R12 still continues to circulate in Cameroonian markets. We can only conclude that border authorities either find it difficult to stop the entry of this refrigerant or simply lack the good will to do so.

In 2003, Richard Mouasso Priso Madengue, a provincial head for the Ministry of Industry, revealed that realities in the field don't reflect the programs put in place by the government as far as ozone layer protection was concerned. He regretted the fact that the Ministry of industry had no representatives at the major entry points of the country to assist in halting the entry of unwanted ODS into the country. The then Ministry of the Environment and

[9] *Ibid.*
[10] *Ibid.*
[11] *Ibid.*
[12] law N^0 2016/004 of 18 April 2016 governing foreign trade in Cameroon.

Forest (this ministry was later divided into two to form the ministry of forestry and wildlife and the ministry of the environment, nature protection and sustainable development) however had a permanent office at the port. They were there to control the entry of equipment containing ODS. It was quite unfortunate to realize that, the presence of the Ministry of the Environment and Forest at the ports did not stop the entry of freezers and refrigerators containing ODS into Cameroon. Equipment containing C134 gas were the once authorized to enter the country. Truth be told, a good quantity of refrigerators and freezers entering Cameroon did not meet this standard.[13]

One of the possible explanation for this was also the fact that, when Cameroonians travelled abroad, they sometimes came back with second handed refrigerators. These were labelled as personal effects. This means that citizens could enter the country with environmentally unfriendly refrigerators and the latter could not be seized because it was considered as personal property for private use. Laws banning the entry of refrigerators containing ODS exist in the country but research has not proven the existence of laws authorizing the entry of such equipment in the case where they were for personal use. However, if such law exist, then it means this law is in contradiction with the 1996 decision banning the import of appliances or equipment containing ODS.[14]

Also, the Cameroonian Union of Enterprises (CUE), a household appliance manufacturing company embarked on a technological conversion. With the help of UNIDO, this company embarked on changing ozone unfriendly gases in its product to replace them with authorized gases. Cameroonian authorities boosted of the fact that this technological conversion had already been done. Nevertheless, this was far from being the truth. This is explained by the fact that this new technology was not yet fully developed. The technological conversion program launched by the state was in reality slow. Cameroonian companies, years after the ratification of the Montreal protocol, were still far from meeting with official standards. This means that gases depleting the ozone layer still kept being emitted into the atmosphere.

State institutions have no accurate data on the number of these dangerous refrigerators and freezers entering the country. Despite the numerous measures taken by policy makers to stop the entry of equipment containing ODS, it is regrettable that these unwanted goods still

[13] TCARCM, Cameroun: hiatus entre les mesures official visant à interdire l`utilisattion des gaz aggravant l`effet de serre utilisés dans les appareils ménagers et la realité du terrain, paper retrieved from https://www.cgspace.cgiar.org consulted on 13/05/2022 at 12 :29pm.
[14] Ayamba Godwill, 47 years, lawyer, Yaounde (Centre), 23 May 2022.

pass through custom check points into the country. This state of things could possibly be explained by the corrupt practices present at these entry points or simply a lack of concern on the part of port authorities associated with the fight for ozone protection. Curiously, shops involved in the sales of ODS contained refrigerators do so under the watchful eyes of the administration who encourage such trade through their silence.

As mentioned in previews chapters, Nsana, in her work propounded an idea according to which, environmental policies in Cameroon came as a result of foreign influence. Decomposing this idea, we quickly realized that environmental actions in the country are not fueled by sincere environmental concerns.[15] A handful of environmentalists also buy this idea. Its argued that environmental considerations in Cameroon are fueled by the country`s desire to meet up with international desires or better still, satisfy western countries who happen to be the brains behind global environmental initiatives.[16] If this perception happens to be true, then it also explains why in Cameroon, environmental laws are not effectively applied by institutions concerned. The consequence of this is that, all the good laws put in place by the government to ensure the protection of the ozone layer cannot produce the results expected.

4.1.2. Weaknesses Related to Sensitization and Educational Strategy

When it came to sensitization and education on the ozone layer problem, the national ozone day was used as an opportunity to raise awareness. As previously seen, ozone clubs were created in some schools. This were to serve for the purpose of sensitization and education among school students. In addition, some media, both public and private, were used to pass messages on the necessity to protect the ozone layer to the public.[17] Despite all the above, weaknesses have been identified in the information transmission system of the Government. To begin with, environmental experts openly criticize the information transmission system put in place by the government. They argue that there is a lack of seriousness by the government as far as educating citizens on the ozone layer problem is concerned.[18] Very few are the schools in which ozone layer clubs were created and a great part, if not all of these schools are found in

[15] L.N Nsana, La politique environementale du Cameroun à la lumiére de la coopération internationale : une analyse de l`influence des grands acteurs environnementaux globaux, Mémoire de master en Diplomacie, Université de Yaoundé II-IRIC, 2015, pp.1-22.
[16] *Ibid.*
[17] Report of the 33rd edition of the international day for the preservation of the ozone layer 2020, 2020, p.3-4.
[18] Tchoffo Benjamin, about 63 years, executive director of Yaounde environmental cabinet, Yaounde (Total Melen), 19 December 2021.

Yaounde alone. School syllables have no great room for environmental problems in general, and the ozone issue in particular.[19]

The major cities of Yaounde and Douala seemed to be more privileged for sensitization campaigns. This shows that a great part of the country is neglected as far as these campaigns were concerned. Data collected via questionnaires using a sample of 100 Cameroonians, 96 have never heard anything about the ozone depletion problem. It was embarrassing to also come across some actors of the refrigeration sector who had no good mastery of the ozone layer problem. Refrigerator technicians in the country can be classified into two. In the first place, we have the trained professionals. In the second place, we have those who will be referred to in the context of this study as the "street learners". The trained professionals refer to those refrigerator technicians who have undergone professional training in the domain, in recognized institutions of training. Street learners are sometimes uneducated and acquire their skills simply from observing and learning from other refrigerator technicians.

Talking with trained professionals, it was realized that they were very much aware of the ozone layer problem and had a good mastery of its causes and consequences. This knowledge has however not been able to make them saints as far as ODS emissions were concerned. This is explained by the fact that even though they had a good mastery of the ozone layer problem, some simply did not care about it. No care is taken by them in the handling of ODS or equipment containing them. This contributed to ODS emissions into the atmosphere. The last class and most dangerous are the street learners who are also commonly accepted or recognized as refrigerator technicians. Many of them have no good knowledge of the ozone layer depletion problem. Some even know nothing about it. These people have always greatly contributed to ozone layer depletion, partly due to their lack of sensitization or education on the subject. Refrigerants like R600a for refrigerators as can be seen in plate 7 below are acceptable for use in the country.

[19] Idem.

Plate 7: Refrigerant 600a commonly known as R600a, its part of the new refrigerants which replace R12, 2022.

Source: Author`s field photo, Ngoa-Ekelle (Yaounde), 27/05/2022.

Note should be taken that these new refrigerants are not harmless to the Ozone layer. They just happen to have lesser impacts on the ozone layer than R12. This means their emission into the atmosphere is still dangerous as it remains ozone unfriendly.

Cameroonian media platforms prioritize political and economic debates. Very little or no space is reserved for environmental issues in general, talk less of the ozone problem. Furthermore, the government in carrying out sensitization, forgets to mention that the cold chain sector is not the only sector responsible for ODS emissions. Many studies concluded that to some extent, the transport sector also contributes to ozone layer depletion, in addition to climate change. This sector contributes to ozone layer depletion through the emission of soot, Sulphur dioxide and Oxides. However, Cameroon at the moment lacks the financial and technological means to fight ozone layer depletion in the transport domain. In a general perspective, the

sensitization and educational system of the government still has a long way to go for it to be judged as effective.

4.1.3. Remedies to the Weaknesses Identified in the Implementation of the Montreal Protocol in Cameroon

Much will never be done in the domain of ozone layer protection for as long as the government does not sincerely include this issue into its national concerns. Those involved in the fight for ozone layer protection have to start by first changing their own mentalities. They have to stop attending to this problem because of external influence or to please foreign environmental powers. They have to realize the ozone layer has to be protected for the sake of the Cameroonian people, ecosystems and all other forms of life. They need to also go as far as making it one of their major priorities. This measure if effectively implemented will carry the fight for ozone layer protection to higher heights. It`s going to result to more seriousness in the handling of the issue.

Measures have to be put in place to enforce laws or ensure the effective implementation of existing laws in Cameroon on ozone layer protection. As seen in chapter 2, the problem is not the absence of laws. Good laws do exist in the country in respect to ozone layer protection. But since these laws are not effectively applied, the state has to take all actions necessary to ensure these laws are effectively implemented. In respect to institutions concerned with the training of custom officers in the country, the ozone problem, its causes, its consequences and the role customs have to play in ozone layer protection have to be included in their syllables.

This should also include training on how to detect ODS or equipment containing them. This way of doing things is advantageous in that all custom officers will be conscious of the problem. This could be more advantageous than the current system of the government which involves selecting a few custom officers (about 200 per year) and training them on the issue. This measure also builds deeper understanding. In a global sense, this will create more motivation in custom officers and push them to effectively play their own part in ozone layer protection where ever they may be found.

Corruption at the entry points of the country is another problem which needs to be addresses. The defeat of corruption at entry points will contribute to halt the entry of unwanted substances through these areas. The practice of tolerating the import of dangerous second handed refrigerators by individuals for private use should be banned. The careless disposal of such refrigerators should be fined to discourage this practice. Refrigerators with cleaner

technologies exist but are too expensive for average Cameroonians. Government could encourage the purchase of this refrigerators by subsidizing their prices. Short training programs should be offered by the government for free to street learners in refrigeration, commonly also accepted as refrigerator technicians. This will help them see the necessity to stop the emission of dangerous gases found in refrigerators. They will also acquire skills which will permit them handle these gases with care so as to prevent their escape into the atmosphere.

Citizens involved in the import and sales of second handed refrigerators should be encouraged and motivated by policy makers to refrain from such environmentally unhealthy trade. In other to measure the level of the effectiveness of governmental measures against unwanted ODS imports or substances like refrigerators and freezers containing ODS, the government has to put in place a statistics committee to census the number of dangerous refrigerators, freezers and air conditioners found in Cameroonian markets and homes. This data will have double advantage, firstly, it will help policy makers know the exact amount of these dangerous appliances circulating in the territory and also, make better decisions based on this data. Lastly, providing such data on an annual basis will permit policy makers measure the effectiveness of port measures in preventing the entry of these products.

In respect to sensitization, a lot remains to be done. Policy makers need to start by making more use of modern technologies to transmit information. It has been noticed that the government sometimes use the major mobile operators of the country to send messages to individuals on various subjects but hardly on the environment. It will be a good idea if the government can still use these mobile operators to send messages educating the population on the ozone problem, its causes, consequences and solutions. This method is advantageous in that; it will permit the government to reach out to a greater number of people. Public and private TV channels should be more involved in the sensitization and education of citizens on environmental issues in general and ozone protection in particular. The place of environmental problems in school syllables should be increased. Governmental sensitization and educational campaigns on the ozone layer should be extended to all parts of the country.

The government needs to ensure that people appointed to head environmental institutions are environmentalists, and not politicians. The advantage of this is that greater results will be produced in the domain of environmental management in Cameroon. The government also needs to understand they cannot protect the ozone layer alone, they need the people and so measures should be taken to effectively include citizens in this fight as they have a big role to play. It is true that decentralized bodies (regions and councils) have environmental

competences. They have the task of implementing the central government`s environmental policy at the regional and municipal levels. The problem we note is that in most cases, these competences were given without the necessary resources needed to ensure their materialization or implementation. These resources should be provided to help these decentralized entities effectively fight for ozone layer protection. If this is not done, then simply decentralizing this fight will yield no real fruits.

4.2. Weaknesses Related to the Application of the Ramsar Convention in Cameroon

Under this section, analysis will be made on some weaknesses observed as far as the implementation of the Ramsar convention in Cameroon was concerned. At the end of this, solutions are proposed to enable policy makers mitigate the various weaknesses evoked.

4.2.1. Judicial and Institutional Weaknesses

It`s important to recall that wetlands are very valuable natural resources due to the services they render both to man and the environment. The contributions of wetlands to the welfare of both man and the environment includes water purification and storage, serves as habitat for some animal species, they serve as a source of food and they equally play a determinant role in climate change mitigation.[20] These important ecosystem services also explains why policy makers in Cameroon were motivated to ratify the Ramsar convention on wetland protection. This was a legally binding multilateral agreement on states to protect wetlands found within their national territories. In respect to this, Cameroon carried out a number of acceptable actions in view of implementing this convention. However, just like in the case of the Montreal protocol, a few weaknesses were identified as far as the implementation of this agreement was concerned.

Many laws on wetland protection existed in Cameroon before even the ratification of the Ramsar convention on wetland protection. Such laws include, ordinance N^0 74-2 of 6 July 1974 signed by Ahmadou Ahidjo, this law made wetlands public property,[21] Law N^0 96/12 of 05 August 1996 relating to environmental management. In addition to all these, we can also mention law N^0 98/005 of 14 April 1998 to lay down regulations governing water resources etc. One will have normally expected that with the ratification of the Ramsar convention in 2006, these laws will have gained more in strength. Article 3 of the Ramsar convention states that,

[20] F. Tazoacha, managing wetland ecosystems to guarantee water security in Cameroon, paper retrieved from https://www.ideasforpeace.org consulted on 11/o6/2022 at 01:20pm.
[21] Ordonnance N^0 74-2 du 6 Juillet 1974 fixant le régime domanial.

contracting parties to the convention shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List, and as far as possible the wise use of wetlands in their territory.[22]

This can be understood to mean the government of Cameroon had to promot the conservation and wise use of wetlands of national and international importance. By extension, the government had to do everything possible to ensure the protection of these areas from pollution or any human activity susceptible of destroying them. Investigations in the field showed that Cameroon is still a good distance from effectively abiding to these laws. Even though laws exist in the country banning the discharge of any solid, liquid or gas into wetlands areas which consiquently lead to their polution, studies showed that this phenomenon is ongoing in the country and is not ready to stop any time soon.[23] These environmental laws are violated under the watchful eyes of those charged with ensuring their implementation. Perprators of such environmentally unfriendly acts most often, manage to escape the nets of the law. Industrial pollutions are destroying the coastal wetland areas of the country. Industries in these areas freely dispose dangerouse waste products into river channels.

Many Cameroonians also see flowing water as good means of getting rid of household waste. Some times, after rainfall, water levels rise, including the strenght with which they flow, this is always used as an opportunity for some people to dispose their waste products. The consequences of such acts are two fold. Firtsly, the wetland area is polluted which intern affect wetland ecosystem services. Secondly, waste materials may block water channels causing floods which destroy property and in worst cases, results in human deaths as can be seen in plate 8 below.

[22] Convention on wetlands of international importance, especially as waterfowl Habitat, paper retrieved from https://www.cameroon-traites-accords.com consulted on 09/02/2022 at 02:03pm.
[23] Njonghanyi Elvis, 60 years, wetland inhabitant, Yaounde (Nkolbissong), 24 May 2022.

Plate 8: House construction on wetland areas, coupled with the disposal of waste into water channels results to flooding

Source: Author`s field photo, École de poste (Yaounde), 30/06/2022

As seen in plate 8 above, wetland areas in the city of Yaounde are being invaded by house construction at a high rate. Wetland plant and animal life are being replaced by house construction and other forms of developmental projects. Aside the destruction of wetland ecosystems, these areas are risky areas for human habitation. The continues invation of these areas reveals the inefficiency of governmental measures in protecting them and the population from the various risks which these areas present.

Wetland reclamation happens to be another serious problem which the government has been unable to halt. This phenomenon happens to be one of the most common ways in which inhabitants of the costal part of the country interfer with wetlands. It is seen as a suitable way of ensuring available land for urban expansion.[24] The increase need for this land comes as a result of population growth via births and rural-urban migrations. This factor explains why the coastal and metropolitan city of Douala has withnessed the most extensive land reclamation projects during the last five decades.[25] This city is believed to be the most urbanised city in the country. Its large scale land reclamation projects began with the construction of the bridge over

[24] K.C. Asangwe, "Monitoring wetlands deterioration in the Cameroon coastal low lands: Implications for management", *Science Direct*, Vol 1, September 2009, p.3.
[25] *Ibid.*

River Wouri linking the Douala city center to the hinterland, the North West, South West and the West regions.[26]

With poplation growth and land pressure, wetlands in the coastal parts of the country are viewed by both the population and administrators as barriers to urban development.[27] Worst of all, the reclamation of swampy areas is often poorly done. This greatly destroys these important ecosystems which are supposed to be sustainably managed and protected by the government. Intense competition for land resulted to careless encroachments into wetland ecosystems. In the city of Yaounde, despite all governmental measures, wetlands are fast giving way to urban developmental projects. Citizens carelessly carry out construction projects on wetland areas without being disturbed, in most cases, by institutions in charge of protecting these zones. Its embarrasing to see the high rate at which houses are replacing wetland vegetation and animals.

The north west regional capital, Bamenda, is home to wetlands such as Ngomgham, Mulang and Menda-Nkwen. These wetlands were invaded and distroyed at alarming rates for agricultural, settlement and administrative purposes. Observations showed that this phenomenon was not ready to end any time soon. Urbanization is a major drive of wetland destruction in this part of the country.[28] The inability of existing laws to efficiently protect wetland areas was realised by Honorable Awudu Mbaya Cyprian and other members of the SDF (Social Democratic Front) party. To address this issue, these paliamentarians proposed a law which had the following objectives: to renforce the protection and preservation of wetland areas, to show the importance of these natural resource and to encourage individuals, communities, enterprices, NGOs, other organs and the state to take more actions in respect to the protection of wetlands.

Article 4 of this proposed law prohibited all forms of activities which led to the destruction of wetland areas. Its article 10 proposed measures under which the exploitation of wetland areas could be permited. These included: the planting of trees, irrigation of wetlands, protecting and preserving animal life found in these areas etc.[29] Had this proposed law been accepted and effectivelly implemented, it would have gone a long way in protecting wetlands in the country. To the surprise of environmentalists, this law was rejected by the militants of

[26] *Ibid.*
[27] *Ibid*.
[28] B.S. Nguh et al, "Land use dynamics and wetland management in Bamenda: Urban development policy implications", *Journal of Sustainable Development,* Vol 9, ISSN: 1913-9063, September 2016, p.142.
[29] Proposed law on protecting and preserving catchment areas, watersheds and wetlands in Cameroon.

the CPDM (Cameroon People`s Democratic Movement) who occupy a greater number of seats in the lower house of paliament.

Cameroonian mangroves are being destroyed at a high rate by citizens for fish smooking, crafting of art objects and for boat construction purposes. According to Langmi Moses, president of the mangrove protection association, the most serious problem faced by Cameroonian mangroves is over exploitation. Degree N^0 2015/1373/PM of 8 June 2015 transfering some powers on the environment from the state to the councils, happens to be another important wetland law in the country. Its article 6 calls on councils to conserve and rationally manage wetland areas. Article 9 makes the exploitation of wetland vegitation for use as fodder or fuel illegal.[30] This law has not been able to stop the rapid destruction of mangroves in particular and wetlands in general. This destruction is sometimes done with the complicity of the government.

Still in respect to mangrove[31] protection, there is still the lack of an effective collaboration between the government and individuals who care about the deplorable situation of mangroves in Cameroon. The president of the mangrove protection association made it known that they asked permission from the government to protect mangroves in the country. The goverment responded by asking them to pay a sum of about 6.5 million FCFA to be authorised to protect these areas.[32] This act clearly discourages private initiatives to protect wetlands. The same goverment which put in place laws on the protection of wetland ecosystems is the same government which allows people violate these laws. Even when this is done, no pressure is mounted on individuals or companies destroying these areas to carry out reforestation. This explains why the destruction of wetlands areas in Cameroon is high and not ready to end any time soon.

Institutions with competence in wetland issues in the country are partialy functional. This affirmation is made based on the fact that despite their existence, wetland destruction continues to take place at high rates. Despite the 2015 degree which gave councils power to protect wetlands, it was discovered that resources needed by councils to implement this degree were not given. As a result, coucils are unable to effectively play the role of “wetland

[30] Degree N^0 2015/1373/PM of 8 June 2015 to lay down rules for exercising some powers transferred by the state to councils on environment.
[31] Remember mangrove forests are one of the major natural wetland types found in Cameroon.
[32] B. Aurore, Cameroon`s mangroves could vanish without action, paper retrieved from https://www.aa.com consulted on 15/06/2022 at 01:25pm.

bodyguards".[33] Certain posts in Cameroon are not occupied based on competence. This is the case with certain environmental institutions.[34] Appointing politicians to environmental positions is risky as it could lead to a fiasco in the environmental domain. This is explained by the fact that such people may not deeply understand the importance of managing the environment in a sustainable manner. In 2011, a reforestation project was launched by the government. However, men who had no good understanding and care for the environment were made resposible for this project. This men had no understanding of natural ecosystems and the vital services which they provide.

According to Moses, ministers have some times ordered the reforestation of mangroves in inappropriate areas out of complete ignorance. It is known in Cameroon that all wetland areas are state owned. The reclamation of these areas is forbiden. Consequently, individuals are not permited to own lands in wetland areas. If this is true then how can we explain the fact that some individuals have land certificates on wetland areas? This reveals a disfunctioning at the level of state institutions. With this, it`s clear that while one state institution is pressing for the protection of wetland areas, another state institution is granting land certificates to citizens on those same areas. This of course leads to people invading these areas. Also, an environmentalist in the city of Yoaunde made it known that the ministry of agriculture came out with a wetland agricultural program known as "projet bas fonds".[35] This project did nothing but encourage citizens to carry out deforestation in wetland areas for agricultural purposes.

In March 8, 2007, Prime Minister Inoni Ephraim issued ministerial degree N^0 63 of 8th March 2007 on the creation of the National Ramsar Committee. This was done so as to ensure the effective implementation of the Ramsar convention ratified by Cameroon the previews year. Over 15 years later, the National Ramsar Committee has not yet been completely created and functioning at full capacity. Had this committee been fully functional, then it`s quite possible it will have had more financial and human resources permitting it to play a more deeper role in wetland protection.[36] Its however important to note that there is a committee at MINEPDED in charge of wetland protection in Cameroon commonly known as the National Ramsar

[33] Assiga Marcel Michel, 52 years, head of service in charge of hygiene, sanitation and the environment at the Yaounde III council, Yaounde (Efoulan), 05 May 2022.
[34] Bih Flobert Angong, 51 years, Wetland Inhabitant, Yaounde (Nkolbissong), 24 May 2022.
[35] Tchoffo Benjamin.
[36] Ndongo Barthélémy, about 66 years, the Ramsar focal point, Yaounde (MINEPDED/Post Centrale), 18 May 2022.

Committee.[37] Nevertheless, this is only a shadow of the original Ramsar Committee previewed by Prime Minister Inoni Ephraim.

The existing committee ensuring the protection of wetlands while waiting for the creation of the Ramsar Committee is facing lots of problems in fulfilling its objectives partly due to lack of the necessary resources. Policy makers did have plans for wetland protection in the country, however, it is regrettable that such plans were not well materialized. The Ramsar focal point[38] regrets the fact that the government makes more funds available for other conventions than for the Ramsar convention. This shows that the protection of wetlands seems not to be a primary objective for the government at the moment.

4.2.2. Weaknesses Related to Sensitization and Educational Strategy

The government has indeed taken certain measures aimed at sensitizing or educating the local population on the importance of wetlands. Despite this, research has shown that a lot still remains to be done in this domain. The high rate of wetland destruction in Cameroon can also be explained by the fact that lots of people are still ignorant about the benefits of this ecosystem. Through the use of questionnaires, it was also discovered that many Cameroonians, and even wetland users had no knowledge or limited knowledge on the economic and environmental benefits of wetland areas.[39] Traditionally, wetlands were considered as useless as wastelands. Cameroonians viewed these areas as breading grounds for pests and dangerous diseases. They were conceived to be dangerous areas, a hideout for witches and wizards, a place where evil spirits were expelled to.[40]

This kind of perception is sadly still a reality today and such thoughts could only result to nothing but the wanton destruction of these areas. Most indigenous communities in the country have put in lots of efforts to do away with wetlands. The result of this has been the continuous reclamation of wetlands into useful lands.[41] This way of perceiving wetlands by many people in the country till today shows that the government sensitization and educational strategy has not been very efficient. It has been observed that the government attaches more importance to wetlands of international importance. The world wetland day is a privileged day exploited by the government to sensitize on wetland issues. This is a problem because very few

[37] Bonguen Carole, 34 years, Expert of Ramsar wetlands at MINEPDED, Yaounde (Post Centrale), 18 May 2022.
[38] Remember that the term "Ramsar focal point" is used to refer to the director in charge of wetland protection in Cameroon.
[39] F. Tazoacha, managing wetland ecosystems to guarantee water security in Cameroon, consulted on 17/06/2022.
[40] *Ibid.*
[41] *Ibid.*

Cameroonians know about the existence of the world wetland day celebrated in Cameroon and only a few people partake in such events.

There is no or very limited use of modern information and communication technologies to reach out to a greater number of people. Most often, meetings organized for wetland sensitization and education are attended by the elites, the administrative class and not by people who are directly at the front line of wetland destruction such as wetland farmers. Some environmental issues including wetlands ecosystem destruction are not thought in schools. In reality, school children go through their education and come out having limited knowledge about environmental problems in general. Sensitization is done in a few areas and not in others. In sum, a lot more still remains to be done in this aspect because the present governmental sensitization method is actually not getting the job done in an efficient manner.

4.2.3. Remedies to the Weaknesses Identified in the Application of the Ramsar Convention in Cameroon

Authorities should put in place measures to ensure the effective implementation of national and international laws concerning wetlands. Some individuals are forced to settle in wetland areas due to the expensive and complex nature of obtaining land certificates on dry land areas. The government has to do everything possible to simplify the process of obtaining land certificates and also, making it less expensive. Corruption is a factor which has to be eradicated from public institutions because this explains why some individuals were able to obtain land certificates on wetland areas. The pollution of wetland areas is a major problem, measures need to be taken to stop the discharge of any form of waste which negatively modify wetland ecosystems. The cleaning of water channels by the councils, environmental NGOs and some individuals are good but not enough. The problem has to be addressed from it`s roots through the implementation of measures to stop people from using wetland areas and water channels as waste bins. One way in which this can be accomplished could be through the improvement in waste collection systems in cities.

There exist a 2007 degree in Cameroon which created the national Ramsar committee but this degree has not yet been applied fully. The full application of these degree is fundamental because it will greatly contribute in ensuring that the Ramsar convention is effectively implimented. Such a committee will have greater resources which will permit it carry out it`s functions. There also exist a 2015 degree which made coucils in charge of protecting wetlands found in their areas of command. The state also has to tranfer all the resources needed by these

councils to implement this degree. This is so because the lack of these resources happens to be what also explains the inability of concils to effectively implement the degree.

The efforts of the government to implement the Ramsar convention, protect and manage wetlands in a sustainable manner also depends on appointing the right people at the right posts. Puting politicians in environmental posts may never produce the results expected by the state. These kind of positions should rather be occupied by environmentalists, people who are environmentally conscious, people who deeply understand the need to achieve a balance between human development and environmental health. There is need to increase collaboration between the various state institutions with environmental competence. This is to avoid contradictory actions as observed in the case of wetlands.

The sensitization strategy of the government can be made better via a greater use of modern information and communication technologies. The advantage of this is that it can permit the state reach out to a greater number of Cameroonians. This could be accomplished through the use of social media platforms, radio and TV channels and giants of communication services in the country. Sensitization and education on wetland protection has to be extended to other parts of the country where they have not yet reached till today. Actors at the frontline of wetland destruction like farmers and industries have to be the major targets where ever they are found. Environmental issues in general have to occupy a primary, and not a secondary position in the educational system of the country. This is important because the more people are educated on the need to protect the environment, the more secured the environment will be. This is a step which should not be negleted if sustainable development must be achieved.

The distruction of the vegetation found on wetland ares also happens to be a problem to wetlands in Cameroon. A healthy and abondant vegetation is neccesary to sustain wetlands, including all forms of life in them. The state needs to take measures which can permit it reduce the high rate of deforestation in wetlands areas, as is currently the case in the coastal regions of the country. This vegitation needs to be protected because they also act as shields, shieling wetlands from sun rays which could dry up the water present in these ares. A lot of reforestation has to be done on wetland areas and measures have to be taken to facilitate and encourage private initiatives in respect to wetland reforestation.

Cameroon made some considerable efforts as far as the implementation of the Montreal protocol and Ramsar convention were concerned. However, the weak inplementation of laws, inappropriate sensitization strategy, institutional weaknesses, corruption, leaving environmental issues in the hands of unqualified people, were some of the weaknesses examined. These weaknesses explained Cameroon`s inability to effectively implement these international environmental laws. These raised the necessity for the country to ensure the effective implementation of laws, fight against corruption, make greater use of modern communication technologies, leaving environmental issues in the hands of qualified people etc.

GENERAL CONCLUSION

This work analysed the influence of the Montreal protocol and Ramsar convention on environmental management in Cameroon. This influence was clearly seen through the manner in which they were implemented in the country. The work enlightened on the historical circumstances which let to the formulation of these multilateral environmental laws. The importance of the ozone layer and wetland ecosystems to both man and the environment were clearly shown. History shows that some great civilizations developed and prospered along river banks. During the 19th century migrations in Cameroon, some tribes settled around wetland areas on which they practiced agriculture, fishing etc. During the early years of the post-independence era, issues related to sustainable environmental management were not a major concern among political elites. Cameroon however participated in some major international environmental meetings which concluded with the signing of conventions.

Before 1992, there were few efforts observed in the country geared towards environmental protection or management. The output of these efforts were however not significant. Many researchers and environmentalist agree on the fact that environmental issues were only seriously considered in the country from 1992. This year marked a turning point in the environmental history of Cameroon and saw the creation of structures or institions with general and specialised competences in environmental issues. Some of these structures had as mission to ensure the implementation of international environmental accords ratifyed or adhered to by Cameroon. An example was the creation of the Ozone Bureau and the National Ramsar Committee, created to respectively ensure the implementation of the Montreal protocol and Ramsar convention.

Since the ratification of the Montreal protocol in 1989, the country took a number of measures to implement this international environmental law. The country can today boast of haven ratified all the six amendments to the Montreal protocol. At the CEMAC level, Cameroon participated in producing an agreement on ozone layer protection applicable to all CEMAC countries. At the national level, Cameroon created the ministry of environment and forestry. This institution also had as responsibility the implementation of the Montreal protocol. The OMC was also created and played a fundamental role as far as implementing the Montreal protocol was concerned. National laws were also formulated protecting the ozone layer. Other measures taken in view of protection the ozone layer include the ban on the import of equipment containing ODS, capacity building and sensitization campaigns.

In respect to the Ramsar convention, Cameroon designated wetlands to be included in the list of wetalnds of international importance with the first being the Waza-Logone flood plain. Cameroon also actively cooperated with other countries in respect to the protection of trans-boundary wetlands such as the LCBC. A committee was created headed by the Ramsar focal point. It was in charge of implementing the Ramsar convention. Measures were equally taken to educate citizens on the need to protect wetland areas. Cameroon celebrate`s world wetland day annualy on February 2. This occapation is also usually exploited to educated people on the need to halt all activities which harm wetland ecosystems. In other to ensure the protection of wetlands all over the national territory, Cameroon in 2015 made councils in the country responsible for the protection of wetlands found in their zones of competence. State and non state actors equally carried out reforestation in wetlands areas where high deforestation rates had been recorded, particularly in the coastal mongrove forests.

Despite these amazing accomplishments, certain weaknesses were observed as far as the implementation of the Montreal protocol and Ramsar convention were concerned. Some factors such as corruption, incompetency, weak implementation of laws, ignorance, institutional weaknesses and many others have made it impossible for these international environmental laws to be effectively implemented in Cameroon. There is therefore a need for Cameroonian authorities to ensure that national laws in respect to ozone layer and wetland protection are strictly respected.

Corruption also has to be eradicated, institutions involved in the protection of these natural resources have to be strengthened and all resources needed for their functioning provided. A more massive sensitization strategy also needs to be adopted. This could be accomplised by making greater use of modern communication technologies. These and many others can help policy makers overcome current challenges faced as far as the effective implementation of these international environmental laws are concerned.

From a general point of view, international environmental laws ratified by Cameroon have been at the origin of many environmental initiatives in the Country. They certainly continue to play a major role as far as environmental management is consrned in Cameroon. The origin of some environmental structures in the country can even be traced to the ratification of certain international multilateral environmental laws by the country. Despite the many weaknesses observed in the implementation of some of these laws, one thing remains certain, they are greatly contributing in creating a safer environment for all Cameroonians.

One last thing to note is the fact that, at the time this research was being conducted, many projects were either being implemented or yet to be implemented. This is in respect to each of the IEL which constituted the focus of this study. In respect to the Montreal protocol on ozone layer protection for example, a lot of projects were still at their implementation stage while others were yet to be implemented at the time this research was being conducted. This also applies to the Ramsar convention on wetland protection. Perhaps, these projects could completely eliminate a great part of the weaknesses observed in the implementation of the Montreal protocol and Ramsar convention in Cameroon. This means the implementation of these IELs are evolutionary and their contributions to environmental management in Cameroon should continuously be monitored.

APPENDICES

Appendice 1: Research Questionnaire

REPUBLIC OF CAMEROON
****
PEACE WORK FATHERLAND
****
THE UNIVERSITY OF YAOUNDE 1
****
POST GRADUATE SCHOOL FOR SOCIAL AND EDUCATIONAL SCIENCE
****
DOCTORATE RESEARCH UNIT FOR HUMAN AND SOCIAL SCIENCES
****
DEPARTMENT OF HISTORY

REPUBLIQUE DU CAMEROUN
****
PAIX TRAVAIL PATRIE
****
UNIVERSITE DE YAOUNDE 1
****
CENTRE DE RECHERCHE ET DE FORMATION DOCTORAL EN SCIENCES HUMAINES, SOCIALES ET EDUCATIVES
****
UNITE DE RECHERCHE ET DE FORMATION DOCTORAL EN SCIENCE HUMAINES ET SOCIALES
****
DEPARTEMENT D'HISTOIRE

Masters II Research Questionnaire

Complete Names_____

Age_____ Occupation_____ Tel_____

Research Topic: The Contributions of the Montreal Protocol and Ramsar Convention to Environmental Management in Cameroon (1989-2021)

NB : All information provided in this questionnaire will be protected and only used for academic porpuses.

1) Since 1960, has environmental problems always been part of political policies in Cameroon? Please justify your answer_____
_____
_____

2) Have you heard of "Ozone layer depletion" before? If yes, what is it all about?_____
_____

3) Can you list some of the causes of Ozone layer depletion?_____
_____

4) What do you understand by "Wetlands"?_____
_____

5) How beneficial are wetland areas to man?_____
_____
_____
_____

6) What are the consequences of developmental projects carried out on wetland areas in Cameroon_____
_____

7) Before 2006, were there any measures taken by Cameroon to protect wetland areas from human invation and destruction? If yes, can you list them?_____

_____
_____

8) Before 1989, were there any measures taken by Cameroon to protect the Ozone layer from destruction? If yes, can you list them?_____

_____
_____

9) Have you heard of the Montreal Protocol on Ozone layer protection before? If yes, what do you think pushed Cameroon to ratify this protocol?_____
_____
_____
_____

10) What actions has Cameroon taken in order to protect the ozone layer in respect to the Montreal Protocol?_____
_____
_____
_____

11) Have you ever come accrose TV or radio documentaries and debates on issues related to the ozone layer problem and solutions? If yes, how often?_____

_____

12) Have you heard of the Ramsar Convention on wetland protection before? If yes, what do you think pushed Cameroon to ratify this convention?_____
_____
_____

13) What actions has Cameroon taken in order to protect wetlands in respect to the Ramsar Convention?_____
_____
_____
_____
_____

14) Have you ever come accrose TV or radio documentaries and debates on issues related to wetland problems and solutions? If yes, how often ?_____
_____
_____

14) Do you know any non-state bodies fighting for wetland protection in Cameroon? If yes, please list them_____
_____
_____

15) Do you think the Montreal Protocol has been effectively implemented in Cameroon? Please justify your answer_____
_____
_____
_____
_____

16) What other things do you think should be done to better implement the Montreal Protocol in Cameroon?_____

_____
_____
_____
_____

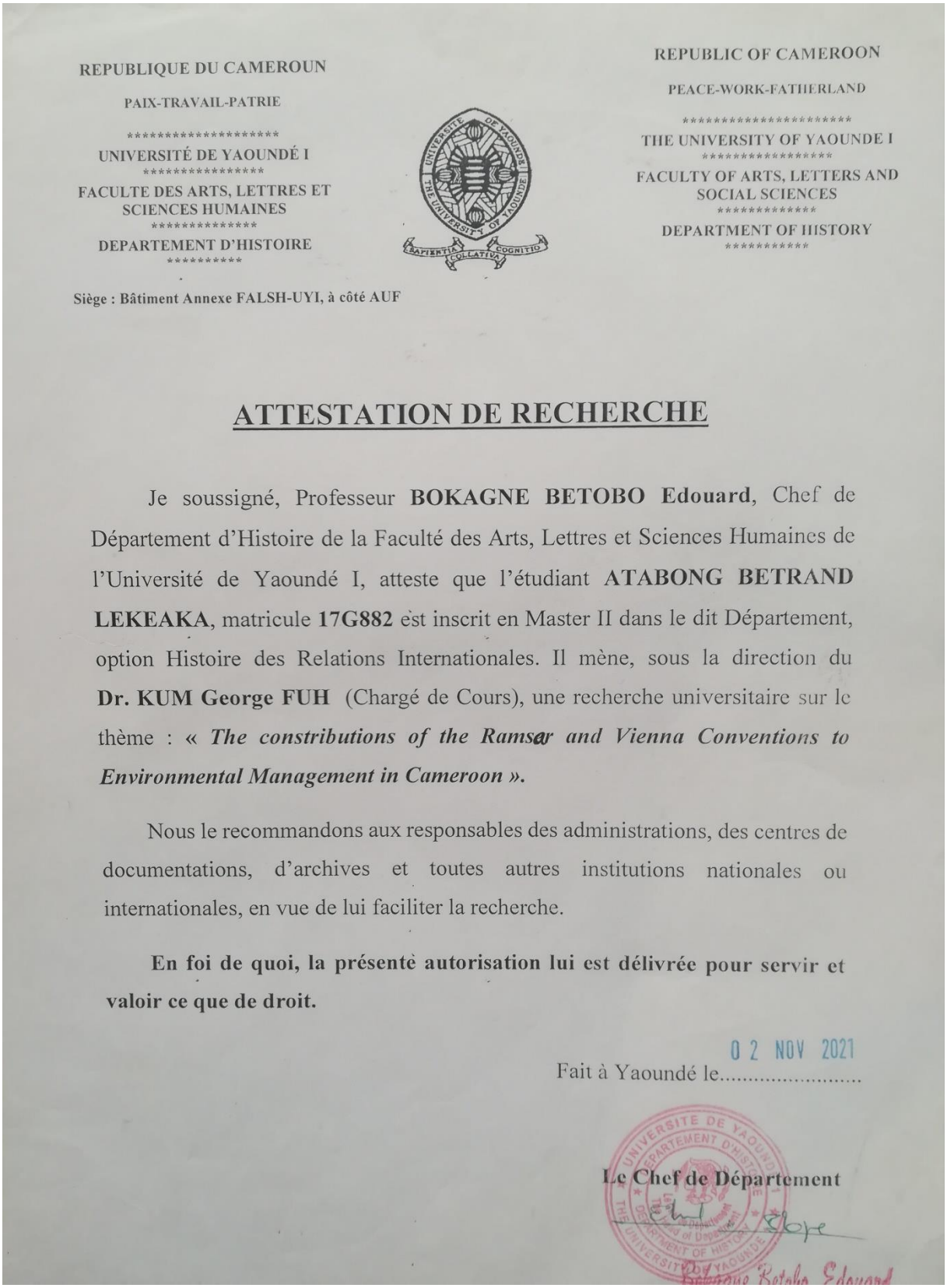
17) Do you think the Ramsar Convention has been Effectively implemented in Cameroon? Please justify your answer_____

_____
_____
_____
_____

18) What other things do you think should be done to better implement the Ramsar Convention in Cameroon?_____

_____
_____
_____
_____

Appendice 2: Research Certificate from the Department of History



REPUBLIQUE DU CAMEROUN
PAIX-TRAVAIL-PATRIE
****
UNIVERSITÉ DE YAOUNDÉ I
****
FACULTE DES ARTS, LETTRES ET SCIENCES HUMAINES
****
DEPARTEMENT D'HISTOIRE
****

Siège : Bâtiment Annexe FALSH-UYI, à côté AUF

REPUBLIC OF CAMEROON
PEACE-WORK-FATHERLAND
****
THE UNIVERSITY OF YAOUNDE I
****
FACULTY OF ARTS, LETTERS AND SOCIAL SCIENCES
****
DEPARTMENT OF HISTORY
****

ATTESTATION DE RECHERCHE

Je soussigné, Professeur **BOKAGNE BETOBO Edouard**, Chef de Département d'Histoire de la Faculté des Arts, Lettres et Sciences Humaines de l'Université de Yaoundé I, atteste que l'étudiant **ATABONG BETRAND LEKEAKA**, matricule **17G882** est inscrit en Master II dans le dit Département, option Histoire des Relations Internationales. Il mène, sous la direction du **Dr. KUM George FUH** (Chargé de Cours), une recherche universitaire sur le thème : « ***The constributions of the Ramsar and Vienna Conventions to Environmental Management in Cameroon*** ».

Nous le recommandons aux responsables des administrations, des centres de documentations, d'archives et toutes autres institutions nationales ou internationales, en vue de lui faciliter la recherche.

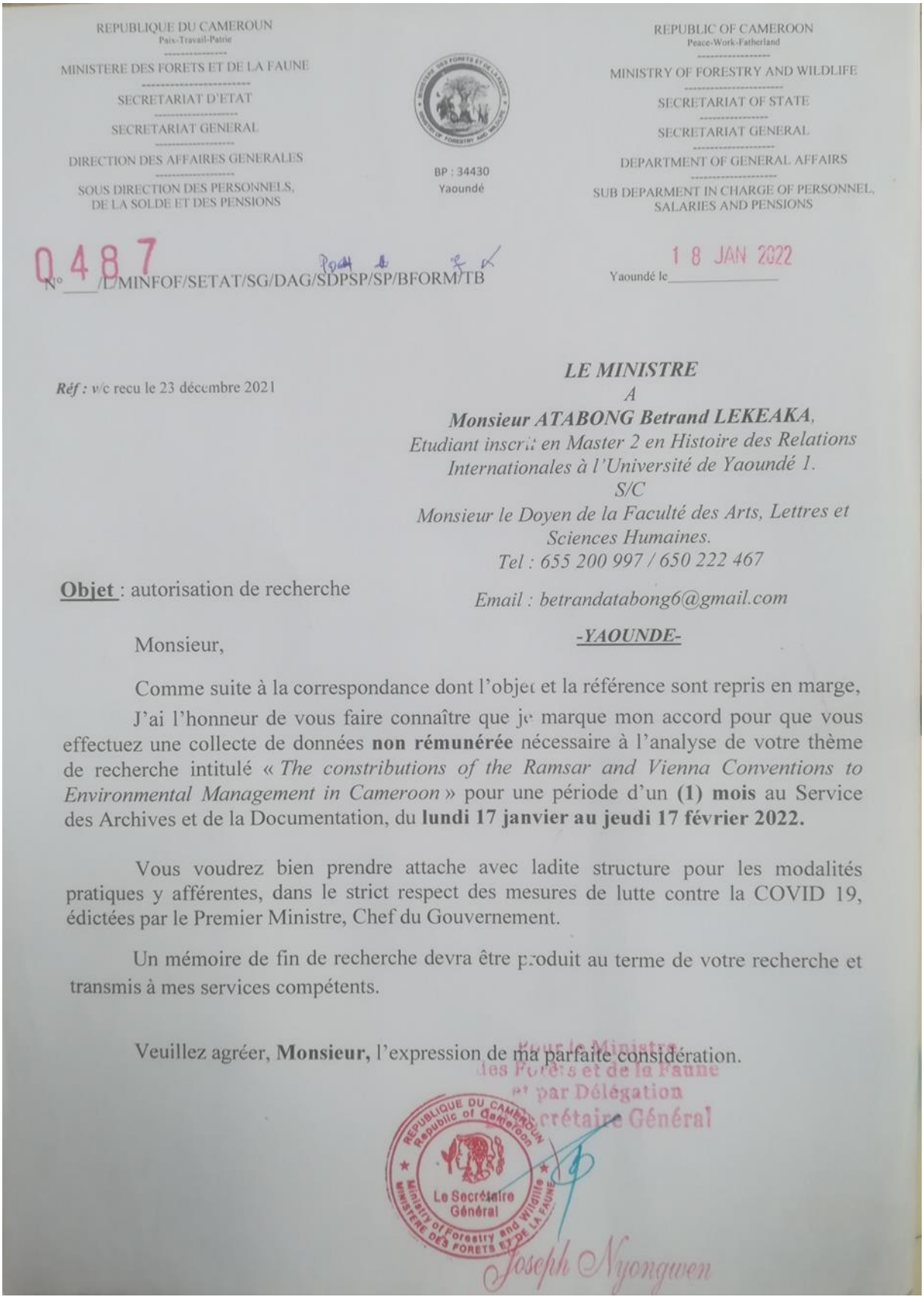
En foi de quoi, la présente autorisation lui est délivrée pour servir et valoir ce que de droit.

Fait à Yaoundé le 02 NOV 2021

Le Chef de Département

Pr Bokagne Betobo Edouard

Appendice 3: Authorization of research from the Ministry of Forestry and Wildlife



REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie

MINISTERE DES FORETS ET DE LA FAUNE

SECRETARIAT D'ETAT

SECRETARIAT GENERAL

DIRECTION DES AFFAIRES GENERALES

SOUS DIRECTION DES PERSONNELS, DE LA SOLDE ET DES PENSIONS

BP : 34430
Yaoundé

REPUBLIC OF CAMEROON
Peace-Work-Fatherland

MINISTRY OF FORESTRY AND WILDLIFE

SECRETARIAT OF STATE

SECRETARIAT GENERAL

DEPARTMENT OF GENERAL AFFAIRS

SUB DEPARMENT IN CHARGE OF PERSONNEL, SALARIES AND PENSIONS

N° 0487 /L/MINFOF/SETAT/SG/DAG/SDPSP/SP/BFORM/TB

Yaoundé le 18 JAN 2022

Réf : *v/c* recu le 23 décembre 2021

LE MINISTRE
A
Monsieur ATABONG Betrand LEKEAKA,
Etudiant inscrit en Master 2 en Histoire des Relations Internationales à l'Université de Yaoundé 1.
S/C
Monsieur le Doyen de la Faculté des Arts, Lettres et Sciences Humaines.
Tel : 655 200 997 / 650 222 467
Email : betrandatabong6@gmail.com

-YAOUNDE-

Objet : autorisation de recherche

Monsieur,

Comme suite à la correspondance dont l'objet et la référence sont repris en marge,

J'ai l'honneur de vous faire connaître que je marque mon accord pour que vous effectuez une collecte de données **non rémunérée** nécessaire à l'analyse de votre thème de recherche intitulé « *The constributions of the Ramsar and Vienna Conventions to Environmental Management in Cameroon* » pour une période d'un **(1) mois** au Service des Archives et de la Documentation, du **lundi 17 janvier au jeudi 17 février 2022.**

Vous voudrez bien prendre attache avec ladite structure pour les modalités pratiques y afférentes, dans le strict respect des mesures de lutte contre la COVID 19, édictées par le Premier Ministre, Chef du Gouvernement.

Un mémoire de fin de recherche devra être produit au terme de votre recherche et transmis à mes services compétents.

Veuillez agréer, **Monsieur,** l'expression de ma parfaite considération.

Pour le Ministre
des Forêts et de la Faune
et par Délégation
Le Secrétaire Général

REPUBLIQUE DU CAMEROUN Republic of Cameroon
Le Secrétaire Général
Ministry of Forestry and Wildlife MINISTERE DES FORETS ET DE LA FAUNE

Joseph Nyongwen

Appendice 4: Authorization of research from the DO of Yaounde III

REPUBLIQUE DU CAMEROUN
Paix - Travail - Patrie

REGION DU CENTRE

DEPARTEMENT DU MFOUNDI

ARRONDISSEMENT DE YAOUNDE 3ème

SOUS-PREFECTURE D'EFOULAN

BUREAU DES AFFAIRES GENERALES

REPUBLIC OF CAMEROON
Peace - Work - Fatherland

CENTRE REGION

MFOUNDI DIVISION

YAOUNDE 3 SUBDIVISION

EFOULAN SUBDIVISIONAL OFFICE

N° 002 /AR/J06.03/BAG

AUTORISATION DE RECHERCHE

Le Sous-préfet de l'Arrondissement de YAOUNDE 3ème soussigné, autorise **Monsieur ATABONG BETRAND LEKEAKA,** Etudiant à la Faculté des Arts, Lettres et Sciences Humaines de l'Université de Yaoundé I, à mener une étude dans l'Arrondissement de Yaoundé 3ème durant la période allant du 08 Mars 2022 au 20 Juin 2022, dans le cadre des recherches académiques sur le thème : « **The contributions of the Ramsar and Vienna Conventions to Environmental Management in Cameroun** ».

En foi de quoi la présente autorisation a été établie et délivrée à l'intéressé pour servir et valoir ce que de droit.

EFOULAN, le 07 MARS 2022

Le Sous-préfet

Serge Hervé BIWELE SAL
Administrateur Civil Principal
Hors Echelle

AMPLIATIONS :

- PREFET/MFOUNDI/YDE
- CHEF DE 3E DEGRE DE YDE IIIe
- INTERESSE
- DOSSIER/CHRONO/ARCHIVES

Appendice 5: Law N^0 2019/011 of 19 June 2019 authorizing the president of Cameroon to ratify the Kigali amendment to the Montreal protocol.

PRESIDENCE DE LA REPUBLIQUE
PRESIDENCY OF THE REPUBLIC
SECRETARIAT GENERAL
SERVICE DU FICHIER LEGISLATIF ET REGLEMENTAIRE
LEGISLATIVE AND STATUTORY AFFAIRS CARD INDEX SERVICE
COPIE CERTIFIEE CONFORME
CERTIFIED TRUE COPY

LAW N$_o$ 2019/011 OF 19 JUIL 2019

TO AUTHORIZE THE PRESIDENT OF THE REPUBLIC TO RATIFY THE AMENDMENT TO THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAYER, ADOPTED IN KIGALI ON 16 OCTOBER 2016

The Parliament deliberated and adopted, the President of the Republic hereby enacts the law set out below:

SECTION 1: The President of the Republic is authorized to ratify the Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted in Kigali on 16 October 2016.

SECTION 2: This law shall be registered, published according to the procedure of urgency and inserted in the Official Gazette in English and French./-

YAOUNDE, 19 JUIL 2019

PAUL BIYA
PRESIDENT OF THE REPUBLIC

Source: https://www.prc.cm/en/news/the-acts/laws/

SOURCES CONSULTED

Primary sources: Oral data

Nº	Names of Informants	Age/Years	Occupation	Place of Interview	Date
1	Abu Simon	53	Wetland Farmer	Bamenda (Meta Quarter)	11/01/ 2022
2	Ajong Ndia Cyprian	46	Real Estate Business Man	Yaounde (École de Poste)	09/10/2021
3	Aminatu Hassatu	50	Wetland farmer/native of Weh	Weh	06/11/2021
4	Angong Belkima Judith	51	Geologist	Wum	08/11/2021
5	Ashu David Orock	53	Environmental Activist	Buea (Clerks Quarters)	25/03/2022
6	Assangmu Diaza	52	Runner of a Refrigeration Enterprise	Yaounde (Efoulan)	13/04/2022
7	Assiga Marcel Michel	52	Head of Service in Charge of Hygiene, Sanitation and the Environment at the Yaounde III Council	Yaounde (Efoulan)	05/05/2022
8	Assomo Sonia	33	Researcher on forest ecosystems	Yaounde (Cradat)	10/11/2021

9	Atabong Aloysius	63	Real Estate Business Man	Kumba (Three corners)	28/08/2022
10	Atangana Dorcas	43	Member of Solidarity Network for the Environment and Leadership	Yaounde (Nlongkak)	10/04/2022
11	Atangana Gustave	38	Trader in Electrical Equipment	Douala (Deido)	28/10/2021
12	Atangana Jean Paul	51	Economist	Yaounde (CAMAIR)	21/02/2021
13	Atemkeng Judith	50	Specialist in Environmental Dynamics and Risks	Shisong	04/02/2022
14	Ayamba Godwill	47	Lawyer	Yaounde (Centre)	23/05/2022
15	Belky Sally	31	Wetland Farmer	Wum	19/09/2022
16	Besong Tagem	44	Specialist in Public Finance and Chief of Records at MINFOF	Yaounde (Post Centrale)	05/03/2022
17	Bih Flobert Angong	51	Wetland Inhabitant	Yaounde (Nkolbisson)	24/05/2022
18	Bihtang Benezet	31	Nurse	Shisong	04/02/2022
19	Cabrel Gills	33	Refrigerator Technician	Yaounde (Ngoa-Ekelle)	14/10/2021

20	Chafack Nelson	44	Wetland Farmer	Kumba (Kossala)	27/12/2021
21	Che Elvis	48	Farmer	Yaounde (Nkolbisson)	12/11/2021
22	Djoko Wilfred	45	Refrigerator Technician	Douala (Deido)	26/10/2021
23	Efafa Oliver	42	Trader in Second Handed Refrigerators	Limbe (Bonadikombo)	10/05/2022
24	Effoe Christopher	39	Biologist/Researcher	Kousseri (Hotel de Ville)	05/09/2022
25	Enow Benjamin Morock	36	Geography Student/Researcher at the University of Buea	Buea (Mile 17)	01/03/2022
26	Ewale Ewamba	38	Trader in Second Handed Refrigerators	Limbe (Bonadikombo)	10/05/2022
27	Fah Georgino	39	Farmer	Bamenda (Meta Quarter)	11/01/2022
28	Fokam Roger	77	Retired Custom Officer	Kumba (Kossala)	29/08/2022
29	Folefack Armel	47	Member of Solidarity Network for the Environment and Leadership	Yaounde (Nlongkak)	10/04/2022
30	Frankline Joseph	48	Ecological activist	Yaounde (Total Melen)	13/11/2021

31	Fruh Rolins Njong	39	Air Conditioner Installer	Limbe (Bonadikombo)	10/05/2022
32	Hassan Abdul	51	Geography/Geology Teacher	Garoua (Bogou)	11/09/2022
33	Kamga Jean Merxiel	43	Sectary at Center for African Forestry Research and Development	Yaounde (Total Melen)	21/12/2021
34	Kamga Roger	29	Worker at HYSACAM	Yaounde (Avenue Kennedy)	16/11/2021
35	Kempes Stephan	51	Assistant of Cité des Nations Bloc Head	Yaounde (Cité des Nations)	09/10/2021
36	Lekeaka Vitalise	31	CEO and founder of Solidarity Network for the Environment and Leadership (SNEL)	Yaounde (Ngoa-Ekelle)	22/12/2021
37	Lonkeng Jackson	41	Wetland Farmer	Yaounde (Shell Obili)	11/01/2022
38	Mande Nestor	34	Member of Solidarity Network for the Environment and Leadership	Yaounde (Mvolye)	22/11/2021
39	Mbonsisi Leonard	38	Farmer	Bamenda (Meta Quarter)	11/01/2022

40	Muandzevara Yusuf	33	Ndop Wetland Farmer	Yaounde (Melen)	15/02/2022
41	Muzanni Aabid	48	Expert in Environmental Issues	Garoua (Bogou)	11/09/2022
42	Najeh Stephanie	48	Ndop Wetland Farmer	Bamenda (Up Station)	07/02/2022
43	Nasser Mutaali	41	Environmentalist	Garoua (Bogou)	11/09/2022
44	Ndongo Barthélémy	About 66	Ramsar Focal Point (Director of the National Ramsar Committee)	Yaounde (MINEPDED/Post Centrale)	18/05/2022
45	Ngale Meende Alfred	About 48	Divisional officer of Kumba III sub division	Kumba (Mambanda)	29/12/2021
46	Ngono Pierre	41	Co-runner of a Refrigeration Enterprise	Yaounde (Efoulan)	13/04/2022
47	Njo Rose	42	Biologist/Researcher	Kousseri (Hotel de Ville)	05/09/2022
48	Njoko Chestel	33	Geography teacher	Yaounde (Cité des Nations)	09/01/2022
49	Njonghanyi Elvis	60	Wetland Inhabitant	Yaounde (Nkolbissong)	24/05/2022

50	Njuemjo Dimitrie	41	Refrigerator Technician	Douala (Deido)	26/10/2021
51	Njuku Charles	42	Geography Teacher	Kumba (Kossala)	27/12/2021
52	Nzeh Betrand	59	Wetland Farmer	Wum	22/09/2022
53	Obaseh Colins	33	Geography Student/Researcher at the University of Buea	Buea (Mile 17)	01/03/2022
54	Salvador Emmanuel	49	Economist	Yaounde (Chateaux)	18/11/2021
55	Sih Christina	54	Farmer	Weh	06/11/2021
56	Tamba Charles	46	Biology Teacher	Yaounde (Essos)	30/04/2022
57	Tambe princewill	42	Forest Guard	Douala (Akwa)	11/03/2022
58	Tchoffo Benjamin	about 63	Executive Director of Yaounde Environmental Cabinet	Yaounde (Total Melen)	19/12/2021
59	Vakunta Sidonie	37	Geography Teacher	Yaounde (Ngousso)	05/10/2021
60	Zoneg Christian	About 50	Trader in electronics	Yaounde (École de Poste)	13/11/2021

N.B: Some informants choosed to stay anonymous, consequently, no information is mentioned about them in the table above.

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