

REVIEW

**Impacts of Terrorism on Biodiversity Management in West Africa Sahel:
A Review**

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ABSTRACT

Over the past 50 years, a number of homegrown solutions and international development assistance have been initiated and implemented to address the West Africa Sahel region's biodiversity resources decline. This ranges from indigenous/community led natural resources regeneration and land restoration techniques, funding and technical support in developing protected areas, military aid, specialized training of forest rangers and massive education of populace on biodiversity protection. Terrorist activities have negatively affected the biodiversity management in West Africa Sahel. However, there is a paucity of information about the impacts of terrorist activities on biodiversity management in West Africa. Therefore, this study tries to close this knowledge gap by describing and highlighting the impact of terrorism on biodiversity in West Africa Sahel. The authors used a systematic review of data through search engines like Google scholar, Z-library, Mendeley, Researchgate and Jstor for reports, scientific articles, books, field notes and other already published materials. The authors also consulted videos and media reports on YouTube, France24, PBS news etc. The study highlighted the key impacts of terrorist activities on biodiversity management. Some of these include the kidnaping of foresters, hijacking and controlling the management protected area like the case of Park W, destroying forest/bush fires, the use of explosive and poaching. These activities destroy animals' habitats and therefore causing biodiversity depletion. The authors recommend the enhancement of the framework of protect areas, enhance the management of conflicts between population around protected areas as some sustainable solutions to biodiversity management. The Sahel states should strengthen their cooperation in building the capacities of the citizens in reducing the viability of terrorism through sustainable green jobs.

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1. Introduction

Biodiversity is the variety of life in the world. Its benefits are fundamental to human well-being and a healthy planet ^[1]. They equally contribute to conditioning ecosystems making the world a livable place. The sustainable use of biodiversity resources is central to attaining the Sustainable Development Goals. As important as these resources may be, they become fragile to mainly anthropogenic factors. Governments and nature conservation agencies have over the years formulated numerous policies and undertaken targeted actions to protect the biodiversity resources both in their jurisdictions and other places. A recent publication by the International Union for the Conservation of Nature (IUCN) found that despite the increase in policies and actions to support biodiversity, indicators showed that biodiversity loss have worsened and there was a further decline in biodiversity resources between 2011 and 2020 ^[2]. Novacek ^[3] argues a sense of urgency about the global-scale degradation of natural habitats, and the resultant threats to potentially millions of species, and advocates for galvanized efforts to both study and conserve what was at risk.

Global demographic growth has been projected to hit 11.2 billion by 2100. Among the many benefits this may offer, adverse impacts to be expected include population expansion and urbanization which will have direct consequences on biodiversity in the form of land use, transport system expansion, acreage expansion of agricultural lands into habitats of biodiversity, destruction of natural habitats like forests to contain the expansions ^[4]. The degradation of these ecosystems results in the declining biodiversity that is further exacerbated by climate change and threaten natural processes which protect human health, provide food, water and clean air ^[5].

Scholarship on biodiversity loss have been attributed to climate change and anthropogenic factors like bush burning, deforestation, poaching, corruption and unregulated land use systems. Some literature attempt to draw a relationship between conflicts and biodiversity loss while others highlighted how specific armed groups like the Boko Haram, the Lord's Resistance Army (LRA) and Alsha-bab among others may have been benefiting from forest resources. It may suffice to say that very little scholarly work has focused on the impacts of terrorism on biodiversity management in West Africa Sahel.

Majority of the biodiversity resources find their habitats in forests. The forests or bushes are usually far from human settlements and they also provide a serene ecosystem for their development. Their preference for serene environments may explain why they tend to move deeper into

the forests when human settlements expand into where they were hitherto found.

The literature on forest conservation and natural resource management is notably silent on the subject of terrorism ^[6]. Other literature, Bhandari et al. ^[7], Hayward ^[8] and Morrison-métois & Lundgren ^[9] among others have all written about forest, ecosystems and biodiversity management, and factors that affect and degrade them. However, the subject of terrorism and its impacts on forest, ecosystems and biodiversity management have not been discussed. Some papers, Agger & Hutson ^[10] and Titeca & Edmond ^[11] have identified poaching and harvesting of ivory as activities of terrorists in some forest. They are however not able to explicitly establish how terrorist activities affect biodiversity management. Mukherjee & Gupta ^[6] were the first writers to construct a framework in which the problems of terrorism and forest conservation are discussed. This paper is however not situated in the African context. To the best of our knowledge, Tubiana ^[12] is the researcher that wrote on the effects of terrorist activities on Protected Areas Management in Sub-Saharan Africa. It may suffice to say that our article is one of the first to explicitly contribute knowledge to the effects of terrorism on biodiversity management in West Africa.

2. Materials and Methods

2.1 Study Area

The West Africa Sahel region is a semi-arid area that runs from the Atlantic Ocean eastward to Chad, separating the Sahara Desert to the north and the Sudanian Savana to the south. The region is one of the poorest and most environmentally degraded in the world, and is considered one of the world's most vulnerable regions to climate change as temperature increases are projected to be 1.5 times higher than in the rest of the world. Warming across the region is expected to continue, with the greatest warming in the Sahel. Climate vulnerability is compounded by the region's high dependence on rainfed agriculture and its natural resources to support food security and livelihoods, rapid population growth, and chronic humanitarian crises due to recurrent drought, flooding, food insecurity, epidemics, and violent conflict ^[13]. The Figure 1 shows the countries within the West Africa Sahel region.

The Inland Forest ecosystems in West Africa provide critical habitat and a considerable large percentage of people draw their food, fuel, and income from them. For instance, the Guinean Forests of West Africa Biodiversity Hotspot has high levels of species richness and endemism, with about 9,000 plants, 917 birds, and 416 mammals. With five critically endangered primate species and an

additional 21 endangered, these forests are among the world's top priorities for primate conservation [13]. Human activities are a significant contributor to the loss of these forests and biodiversity resources [14].

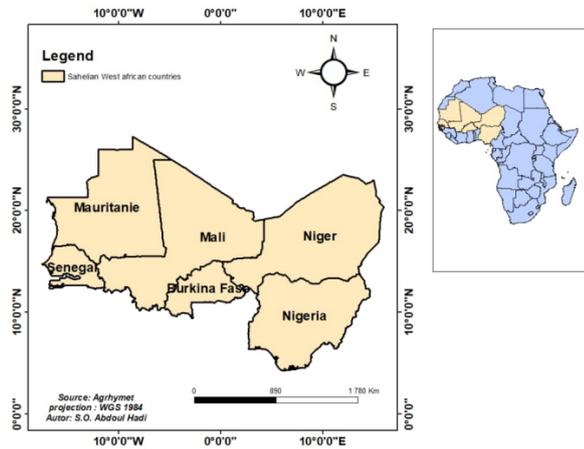


Figure 1. Map of West Africa Sahel Region

The West African region has for some years now experienced varied levels of conflicts, civil wars and political instability. The Sahelian part of the region can be regarded as a fertile ground for terrorists and armed extremist groups. As the conflict in Syria subsided, Islamic States and its affiliates have shifted their focus to sub-Saharan Africa and the Sahel region in particular. It was found that 48% of global terrorism deaths happened in Sub-Saharan Africa with most of them recorded in Niger, Burkina Faso, Mali and DR Congo [15]. Complex and systemic factors such as poor water resource management and distribution, lack of food, malnutrition, strong population growth, resource distribution disparities and weak governments

among others have created favorable conditions for terrorists.

2.2 Data Collection Methods

Secondary data were used in this review paper. In writing, we relied on reports, scientific articles, books, field notes and other already published materials. We began by identifying key themes of the topic to help us in our review: Biodiversity, Terrorists, Terrorism, Forests and Protected areas, Poaching and Biodiversity management. Search engines such as Google, Google scholar, Researchgate, Mendeley and Z-Library online book store among others were consulted to obtain scientifically published materials. We filtered the search in the following ways: biodiversity and forests; terrorism and forest resources; terrorism and protected areas in West Africa; terrorism and biodiversity management in West Africa; terrorists and poaching; biodiversity resources in West Africa and Terrorism in West Africa. We did not limit the year scope in the search for literature for terrorism. However, we limited our search for literature on biodiversity to 2015-2022. We intended getting enough information on terrorism, biodiversity and how terrorism could affect biodiversity. We further searched for instances where terrorist in their activities protect biodiversity and forest resources. We therefore considered acts of terrorism that had a relation to forests and biodiversity. How they used forests and biodiversity resources to fund their activities. We did not consider terrorists attacks on humans, deaths and development. The Figure 2 gives an overview of the methodology used. It highlights the key concepts that guided the review and the sources data were obtained.

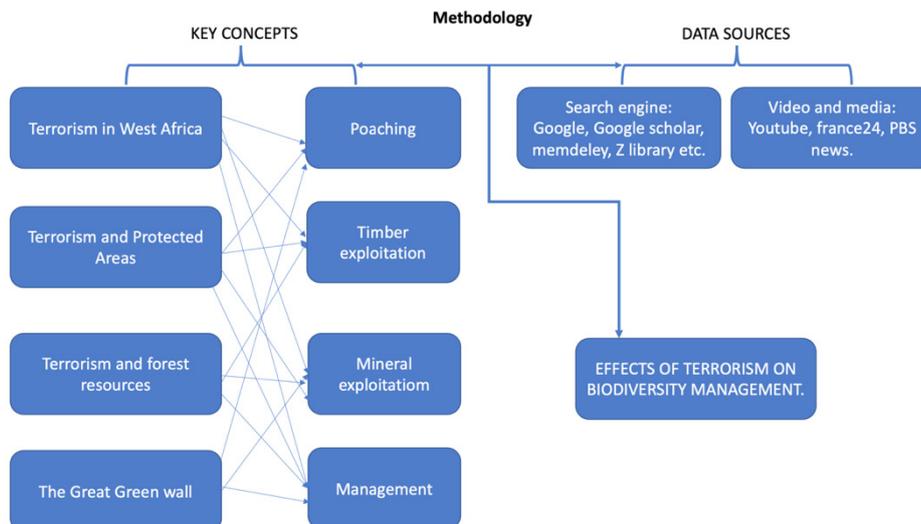


Figure 2. Schematic representation of methodology

Source: Author's construct

3. Results and Discussions

3.1 Biodiversity Resources

United Nations Earth Summit defined biodiversity as ‘Biological diversity’, meaning the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems^[1]. This captures the totality of life, ecosystems and species. The creation of protected areas such as National Parks is the result of commendable regional, national or local initiatives, with approaches that intersect with many power issues that go well beyond the simple ecological question^[16]. There are more than 2,000 protected areas in West Africa (including Chad). West African terrestrial protected areas represent about 8% of the world’s protected territory, and marine protected areas only 2.5%^[17]. The population of West Africa depends largely on the services produced by these national parks, particularly eco-tourism, which is a major economic driver in the Sahel countries. The continued growth of tourism in West Africa makes this sector an important vector for economic growth. Some protected areas are even located in areas controlled by rebel groups. Insecurity directly threatens management staff of these protected areas and forces them to reduce or even suspend their anti-poaching operations or any other management action^[12].

Several factors contribute to the genuine tourist attraction of the Sahelian regions. This is the case of natural resources which are reservoirs of diversified fauna and flora. In the present study, Park W, which is a transboundary reserve rich in tourist potential, is shared by three (3) countries: Benin, Burkina Faso and Niger and constitutes a potential source of income for the countries concerned. In Burkina Faso, the village of Karfiguéla, which constitutes a tourist site in a concrete way, generated about 58.45 million FCFA (89,026 €) of tourist revenues over the period from 2005 to 2019. According to the distribution agreement, the village receives 10%. As such, it has received 5.85 million FCFA (€ 8,903). These amounts vary from year to year, depending on the number of visitors to the site^[18].

Nevertheless, in recent years, these areas with high economic potential have been invaded by terrorists who block the use and management of these spaces. Many protected areas in the Sahel are now located within conflict zones, some of which are long-lasting, or are facing new security risks and new forms of violence. The case of W-Arly-Pendjari complex in West Africa, which is rich in various vegetation types (grasslands, galleries, savannahs etc.) and

wildlife (elephants, buffalo, cheetahs etc) remain threatened. Currently, the largest elephant populations (about 4,500 individuals) are found in the WAP complex^[19]. As for the lion, a recent study shows that its numbers in West Africa are steadily declining and are estimated to be limited to only 406^[20]. Since 1990, the estimated population within 30 km of the WAP complex has more than doubled to 3.5 million individuals. Increasing agricultural frontages, poaching, transhumance grazing, and illegal exploitation of non-timber resources are putting increasing pressure on wildlife. Figure 3 illustrates the case of protected areas in Niger. It presents the identified pressures on protected areas and it is found that poaching and exploitation of timber and non-timber forest products are the two main threats that are caused by population expansion.

3.2 Terrorist Activities as Driver of Habitat Destruction

While the impact of the jihadist phenomenon is significant in the case of Burkina Faso and the parks of the four borders region (Mali, Burkina Faso, Chad and Niger), one cannot help but think of the consequences on socio-economic and environmental activities. This phenomenon of insecurity has significant impacts on the biodiversity of the Sahel, which is already affected by climate change. In Niger, the extreme lands in the Lake Chad Basin valley (notably the Diffa region) that are under attack by Boko Haram are a striking example of land loss that has led to excessive loss of woody diversity due to the installation of refugee camps that disrupt the tranquility of wild animals. This has resulted in profound changes not only in the landscape already affected by desertification but also in the loss of many habitats^[22]. According to Leonhardt^[23], transhumant herders and cattle breeders are often the main perpetrators of the degradation of habitats, notably through late fires to provoke regrowth, which causes the disturbance of wildlife and the degradation of herbaceous strata and woody stands.

One study shows that in Burkina Faso, elephants prefer areas on the edge of the protected area, close to villagers, perhaps because they are less frequented by poachers^[24]. This is because poachers sometimes constitute terrorists in their own right, using protected areas not only as a refuge but also as a source of income to buy weapons. It should also be noted that animals in protected areas are a source of food for terrorists, leading to competition between the needs of the animals and the terrorists. In Niger, giraffes share the environment with farmers and herders, and although this has resulted in some protection of the species from poachers, conflicts arise from crop damage. Coexistence is however possible^[25].

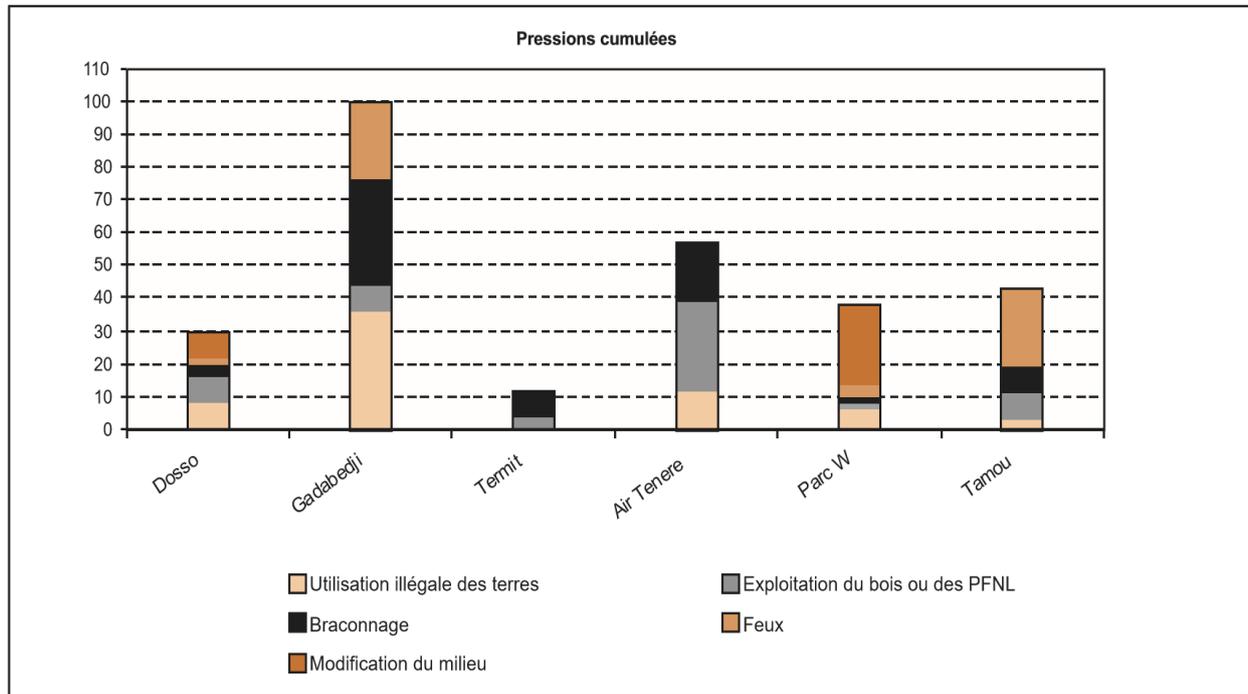


Figure 3. Distribution of the types of pressures on protected areas in Niger

Source: UICN/PACO ^[21].

3.3 Terrorism and the African Great Green Wall in West African Sahel

The Great Green Wall (GGW) initiative can be regarded as one of the most ambitious projects of the Sahel region. Though the Great Green Wall initiative was launched in 2007, the vision of a ‘Great Green Wall’ dates back decades to the 1970s, when the Sahel was rocked by successive droughts, and vast swathes of fertile land started to become severely degraded. It was thought that since once upon a time, the land supported millions of livelihoods before becoming severely degraded, there was some hope of restoring it ^[26].

The GGW initiative is a project of the African Union Commission with an oversight by the Pan African Agency of the Great Green Wall. It covers eleven Sahelian countries; Senegal, Burkina Faso, Chad, Djibouti, Mali, Mauritania, Niger, Ethiopia, Sudan, Egypt and Nigeria. The project aims to restore 100 million hectares of degraded lands by planting trees over an 8000 km ^[27] stretch across these countries. The 15 km wide Green Wall is intended to slow the southwards desert expansion ^[28]. It further aims to provide green jobs to 10 million rural dwellers since the allocated areas were mainly found in the rural areas. This will therefore provide a sustainable and decent livelihood for people and also sequester 250 million tons of carbon dioxide ^[29].

Given the fact that the vulnerability to climate change impacts has reinforced conflicts and terrorism, the Green Great Wall initiative has the potential of addressing these challenges. In the Sahel, just like in other jurisdictions, there is a strong link between poverty, hopelessness, dissatisfaction and recruitment of people into terrorist groups ^[30]. Therefore, if people have decent and sustainable jobs, it becomes difficult to recruit them into terrorist organizations as an income generation strategy. Even though some progress has been made over the years, terrorism in the Sahel has impaired its progress ^[31]. Terrorist activities have caused massive displacements of community members thereby causing community members who are caretakers of the plants to abandon their roles ^[26]. This security threat has further limited the efforts of experts in visiting some of these sites to provide technical support. For instance, Benjaminsen et al. ^[32] found that countries like Mali and Nigeria have seen conflicts and terrorist activities inhibit the progress of the implementation of the initiative which makes it difficult in gauging the results of the initiative so far. These growing security and terrorist activities along the Sahel region have had an influence on the international community’s strategy of shifting their international investment and development assistance into military aid. This is a strategy to battle the increasing insurgency and to control the migration of people from the Sahel into Europe. A strategy that has coincided with

the support for the Great Green Wall programme ^[33]. The Figure 4 shows the path of the Great Green Wall and the countries that are currently participating in the initiative.

3.4 Terrorism: The Ambiguity

Terrorism has gained notoriety in national and international social, political and security discourse. Scholars like Borum ^[34], Laqueur ^[35] and Crenshaw ^[36] among others have argued about the psychology of terrorism and how it plays a key role someone's choice to become a terrorist. The fluid nature of the concept terrorism has made it difficult for countries and the international community to agree on a definition and designing effective counter-terrorism measures. For instance, the following definitions were cited in Sgt Adrian Borunda's write up on Definitions Terrorism. *"Criminal acts intended or calculated to provoke a state of terror in the general public, a group of persons or particular persons for political purposes are in any circumstance unjustifiable, whatever the considerations of a political, philosophical, ideological, racial, ethnic, religious or any other nature that may be invoked to justify them"* UN General Assembly Resolution 49/60 adopted on December 9, 1994. The Arab Convention for the Suppression of Terrorism held in Egypt in 1998 viewed terrorism as any act of threat or violence that seek to sow panic among people, harming or placing their liberty and security in danger or to cause damage to the environment or national resources. The European Union's Framework Decision on Combating Terrorism (2002)

define terrorism as acts that seriously damage a country or international organization, intimidating the population, and compelling the government or international organization to perform or abstain from performing any act, or destroying the fundamental political, economic and social structure of a country. These definitions are not specific to some actions and so it becomes ambiguous on what exactly terrorism is, as one act may be regarded as terrorism while it can be seen differently in another jurisdiction.

Also, these inherently controversial definitions are skewed towards non state actors, militants or freedom fighters. They do not in any way point to governments' actions that may violate fundamental human rights of citizens. The skewed nature of these definitions can be argued to be for political reasons, as governments use them to secure international funding. As argued by Felbab-Brown ^[37], these bring military support from abroad to African Governments. In most African jurisdictions where there have been dictatorship governments, political leaders exerted some force and "Terrorized" citizens, limited their liberties and freedoms, and kidnapped or killed their political opponents in order to maintain power. During such periods, indigenous groups that emerge to fight against the dictatorship and to defend their civil rights are labeled as terrorists by the governments. It has therefore become a challenge for the international community to streamline its counter terrorism actions and support as it may infringe on a country's sovereignty. Laqueur ^[38] simply captures this ambiguity as; one man's freedom fighter is another man's terrorist.

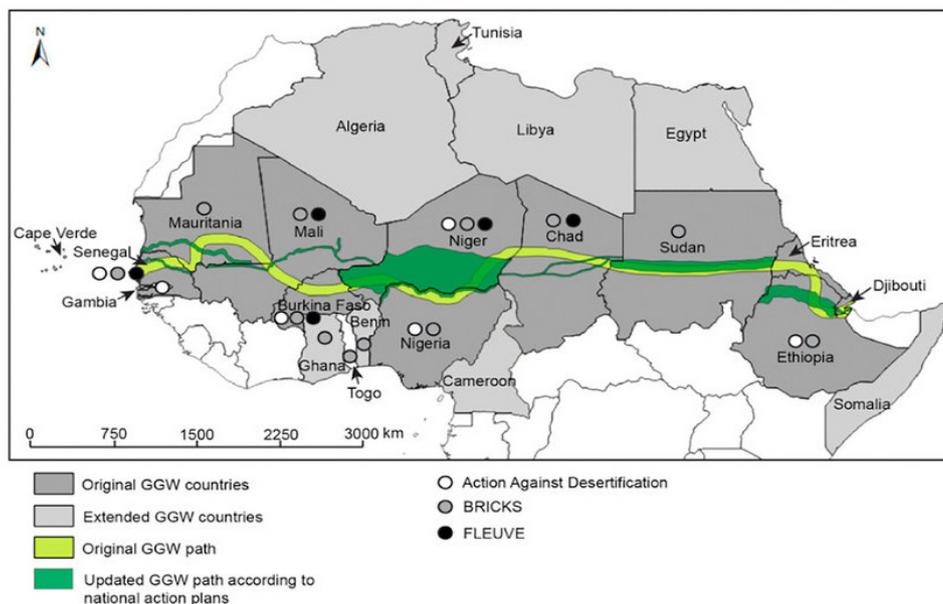


Figure 4. Path of the Africa Great Green Wall

Source: Goffner et al. ^[28].

3.5 The Idiosyncrasies of Terrorism

Terrorism and the activities of terrorist groups have been largely driven by ideologies and psychology. Some of these ideologies have religious underpinnings while others are socio-political. In an interview with Osama Bin Ladin by America Broadcasting Cooperation's John Mil- lar, conducted on 28th May, 1998, the former justified his terrorist attacks and activities by saying it was ordained by Allah as a holy struggle Jihad to cleanse the world of unbelievers and to raise the word of Allah above that of unbelievers^[39]. Scull et al.^[40] relate to a recent interview with prison inmates who were once involved with ISIS and Al-Qaeda on the subject of why people join terrorist groups. Five main reasons identified by the inmates were the progression of religious identity, personal connections in the form of developing close social bonds with individuals and religious organizations, propaganda influenced by social media, defense of Islam with the perception that the Sunni sect is under threat and social marginalization. Others join these extremist groups because of legitimate or illegitimate grievances, perceptions of exclusion from social and economic benefits like employment, water, electricity and amenities they may hold as very important to their survival.

A sense of cultural threat among a people can also result in the formation such groups. For instance, a tribe can mobilize themselves into a group to protect their 'turf' against external aggression. Such groups, though with a clear intention of protecting their culture and people, more often than not degenerate into extremist groups if they are not well regulated. Motivations such as the promise of economic stability, prospects of fame, glory, or respect, and personal connections, including family and friendship networks^[41] have enticed a number of youths to join terrorist groups. Gómez et al.^[42] have stated that individuals may join a terrorist group when they perceive that there is a convergence between them and the group. The 3N model (Need, Narrative and Network), has been argued by scholars as the general drivers for joining terrorist groups. Kruglanski et al.^[43] argue that being a member of these groups satisfies the individual's basic need such as the need to feel valued or respected by others. In some cases, when individuals feel a sense of personal failure, interpersonal rejection and social alienation which can make an individual feel insignificant or loss of a compelling life narrative or purpose, they tend to restore it by join groups that offer them a sense of purpose paired with a feeling of camaraderie^[44]. By joining these groups, they are able to establish new narratives that give meaning to their lives and the feeling that, they have within them some power to

instill fear and make people do what ask. It gets more interesting to them when they are able to instill fear in those that hitherto made them feel worthless. Fortunately for most extremist groups, the promise of restoration is used as a strategy to recruit (un)suspecting youth.

3.6 Terrorism: A Tool of Biodiversity Conservationists?

Liddick's^[45] book titled "Eco-terrorism: radical environmental and animal liberation movements" reveals how the actions and efforts of animal rights movements and environmentalists result in outcomes that are likened to terrorism. This further contributes to the controversiality of the concept terrorism. For instance, some animal rights groups and environmentalists have turned from peaceful protests and lobbying to acts such as arson, vandalism and sometimes violent attacks against people. The Earth Liberation Front (ELF) that emerged in the UK in 1992 has through its actions caused over \$100 million in property damages since 1997 in North America. Abbey^[46] details how Hunting-don Life Sciences, an international company that tests pharmaceuticals on animals has witnessed the ongoing campaign of terror and violence from eco-terrorists. Employees were beaten with clubs, sprayed in the face with acids and subjected to death threats directed at their children. The ELF in 2001 quoted Dave Foreman, a cofounder of the radical environmental movement, Earth First as a bases for their action. 'In everything we do, the primary consideration should be for the long-term health and native diversity of Earth. After that, we can consider the welfare of humans. We should be kind, compassionate, and caring with other people, but Earth comes first'^[45] (page 2).

These acts of eco-terrorists are motivated by the fact that biodiversity plays a key role in the functioning of the planet and should be protected by all. They therefore target institutions whose activities they believe have detrimental effects on biodiversity. From available literature, they target animal research institutes, timber companies and pharmaceutical companies that conduct trials on animals among others. Though their intentions to protect biodiversity is laudable, the extremity of their actions have received widespread condemnation.

3.7 Freedom Fighters and the Exploitation of Biodiversity

Africa's natural resource endowment and its management systems have often caused insecurity and terrorism^[47]. Groups that feel cheated in resource distribution especially when the natural resources are found within their communities may take up arms to violently demand a

fairer share in the resource allocation. It is also the case that they may engage in violent actions to prevent the exploitation of such resources. Banunle and Apau's argument can be considered a corroboration of Kishi et al.^[48] position that, natural resources are linked with most violent conflicts. They further contend that terrorism in African environment seems more likely and attractive for at least two reasons, the continent has abundant natural resources; and conflicts or terrorism is more likely where rents from such resources are not fairly distributed. The Institute for Economics & Peace^[15] found that 30 percent of the global mineral reserves exist in Africa. This therefore heightens the interests of citizens to benefit more from this resource endowment. Unfortunately, in many cases, these expectations are not met resulting in protests and extreme violence. As groups emerge with the aim of fighting for the rights of the ordinary citizens, they resort to extreme violent actions in resistance to state actors. As these groups evolve, the need for more firepower and recruitment of members become eminent with its attendant resource requirements. They, just like the Lord Resistance Army^[10] will begin to engage in poaching to sell meat and ivory, felling trees for timber and artisanal mining in biodiversity resource rich locations in order to raise funds for their activities and expansion

4. Conclusions

Biodiversity resources remain one of the sources of revenue for African economies through tourism. Initiatives like the Great Green Wall, Parks and forest reserves contribute greatly to conditioning the climate and restoring ecosystems. Effective biodiversity management and development has the potential of creating sustainable green jobs, improving standards of living, recreation, health and social cohesion among other benefits. For instance, the Great Green Wall initiative is seen to have the potential of addressing the terrorism menace in the Sahel through the millions of jobs it will create.

Terrorism in the West African Sahel region continuous to be a major developmental challenge. The definition of terrorism and who is a terrorist largely remains ambiguous. However, the activities of terrorists remain clear and condemnable given the atrocities they come with. The importance of Africa's biodiversity resources can only be felt when there are effective management systems in place. The forests which remain a habitat for most biodiversity resources have become rather dangerous places, given that they are considered safe havens for terrorists. Terrorist engage in such activities like poaching, mineral and timber exploitations to raise funding for their operations. Their presence in these biodiversity habitats equally poses

a big challenge to biodiversity management efforts. For instance, a war between terrorists and the state machinery would not only lead to loss of lives but further destruction to biodiversity.

More research is needed on biodiversity management and terrorism in West African Sahel. Future research could focus on, How military interventions (war) with terrorists affect biodiversity; Sustainable biodiversity management in the face of terrorism in the Sahel and How biodiversity could be used as a tool for addressing conflicts in West Africa.

Conflict of Interest

There is no conflict of interest.

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