

## Comparative Analysis of National Parks in the Sahel Region, Wildlife Protection in the Sahel Countries<sup>1</sup>

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### Abstract:

The Sahel region is characterized by semi-arid conditions and fragile ecosystems. The area faces extreme climate variability, recurrent droughts, and accelerating soil erosion. Communities are also exposed to political instability, armed conflicts, and economic crises. This combination creates a highly vulnerable environment where environmental, social, and security challenges reinforce one another, making the Sahel one of the most fragile regions in the world. In this context, national parks play a role that extends far beyond traditional conservation. They are not only biodiversity reserves but also potential instruments for stability, sustainable livelihoods, and community engagement. By protecting ecosystems, supporting local populations, and offering opportunities for tourism and income generation, they can contribute to resilience in a region under constant pressure. This analysis examines the national parks of seven Sahel countries—Mauritania, Mali, Burkina Faso, Chad, Benin, Niger, and Nigeria—in a comparative way. The focus is placed on institutional capacity, management practices, security issues, and the degree of community participation. Special attention is also given to the role of tourism as both an economic driver and a tool for social cohesion. By comparing the countries, common patterns as well as major differences emerge. These insights help explain why similar ecological corridors may lead to very different developmental pathways, depending on governance, resources, and community involvement.

### Keywords:

Sahel region; national parks; wildlife conservation; biodiversity protection; comparative analysis.

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## 1. Introduction

The Sahel region is a transitional zone extending between the Sahara Desert and sub-Saharan Africa, which, by virtue of its geographical location, has always been considered a sensitive area. The ecological systems here are particularly vulnerable, as the semi-arid climate, extreme weather fluctuations, frequent droughts, and soil erosion all contribute to environmental instability. Moreover, the societies living in the region have long been exposed to political uncertainties, armed conflicts, and economic crises. This complex situation results in environmental, social, and security challenges mutually reinforcing each other, making the Sahel one of the world's most vulnerable regions.

Due to this distinctive interconnectedness, the role of national parks in the region extends far beyond traditional nature conservation. Whereas in other geographical contexts the primary task of parks is to preserve biodiversity and landscape values, in the Sahel these institutions are often complemented by socio-political and security functions. The parks provide sanctuary for species populations of outstanding global importance (such as elephants, big cats, and endangered antelope species), while at the same time they can strengthen the resilience of local communities by offering alternative livelihoods, generating development projects, and partially contributing to the maintenance of regional stability.

The aim of this analysis is to examine the national parks of seven Sahel countries (Mauritania, Mali, Burkina Faso, Chad, Benin, Niger, and Nigeria) in a comparative manner. The focus is on operational viability, institutional and management solutions, security factors, as well as the room for maneuver in community participation and tourism. By comparing countries relative to each other, we reveal common patterns and essential differences. Through this, it becomes comprehensible how the same ecological corridors can follow completely different development trajectories. One example of this is the W-Arly-Pendjari complex spanning three countries: successful nature conservation and tourism development commenced in Benin, whilst in Burkina Faso and Niger the parks collapsed as a consequence of armed conflicts (UNESCO World Heritage Centre, n.d.). As a brief counterpoint, the countries of the East African Community (EAC) also appear, where a more stable institutional background and economic embeddedness linked to tourism offer a strong contrast to Sahelian experiences.

The methodology of the study builds upon international and regional reports (such as the International Union for Conservation of Nature, hereinafter: IUCN; United Nations Environment Programme, hereinafter: UNEP, Crisis Group), governmental background materials, and independent field reports. These are supplemented by the most recent data from the World Database on Protected Areas (hereinafter: WDPA), the United Nations World Tourism Organization (hereinafter: UNWTO), and the Armed Conflict Location & Event Data Project (hereinafter: ACLED), which enable numerical comparison of the extent of protected areas, tourist flows, and the frequency of armed incidents. The qualitative descriptions and quantitative indicators complement

each other to ensure that we not only see the size of designated protected areas but can also interpret their actual functioning, achievements, and risks.

Part of the analysis's terminological framework includes the distinction between *de jure* and *de facto* functioning, as well as the use of the concept of "paper parks." *De jure* status signifies legal designation, whilst *de facto* functioning refers to actual field presence, management, and community embeddedness. The term "paper park" refers to protected areas existing merely on paper: their protection and community support is not secured, rendering their ecological function largely illusory (UNEP–WCMC & IUCN, n.d.; International Crisis Group, 2023).

The fundamental question raised by the analysis is how nature conservation institutions, security dynamics, and community participation shape the actual operational capacity of parks, and how all of this can contribute to the region's social and economic development.

## *2. The Nature Conservation System of the Sahel Region*

Sharp differences can be observed among the nature conservation systems of the Sahel countries, which are distinctly delineated even within the same ecological corridors. In states with a more stable political and security environment, the parks actually function, whereas in conflict-afflicted countries, protected areas frequently exist only on paper. The differences can therefore be captured primarily not in the size of designated areas but rather in management, state presence, and community embeddedness (UNEP–WCMC & IUCN, n.d.; Ramsar Secretariat, n.d.).

This fault line is most strikingly illustrated by the example of the W–Arly–Pendjari complex (hereinafter: WAP). In Benin, through professional management introduced by African Parks and revenue sharing arrangements, the parks actually function (UNESCO World Heritage Centre, n.d.), whilst in the Burkinabe and Nigerien sections, armed groups have assumed control (International Crisis Group, 2023), which has led to the virtually complete collapse of nature conservation. Stability, however, is not in itself a sufficient condition. In Benin, management innovation and community involvement are transforming nature conservation into a tourism product (CENAGREF, n.d.), whilst in Mauritania, despite the outstanding ecological value of Banc d'Arguin, weak tourism embeddedness perpetuates lasting donor dependency. The juxtaposition of the two cases indicates that operational capacity also requires market and institutional embeddedness (PNBA, n.d.).

The size of designated areas likewise carries a dual meaning. In Niger, the extensive reserves of Termit–Tin-Toumma and Aïr–Ténéré improve *de jure* indicators, yet *de facto* functioning remains limited due to weak state presence and security risks (UNEP–WCMC & IUCN, n.d.), constituting a classic paper park situation. In Chad, by contrast, the relatively compact network (Zakouma, Siniaka-Minia, Sena Oura) achieves measurable results through combating poaching and implementing community programmes (African Parks, n.d.). Where the security situation collapses, functioning ceases entirely. In the cases of Mali and Burkina Faso, targeted attacks against ranger infrastructure and



the withdrawal of field presence have resulted in a lasting operational crisis, which is particularly conspicuous in the Burkinabe section of WAP (Africa Center for Strategic Studies, 2025).

Elsewhere, demographic pressure and land use render parks vulnerable. In Nigeria, high population density, low protected area ratio, and security risks collectively weaken the viability of tourism-based models, even when certain units are relatively operational (BirdLife International, n.d.; WCS Nigeria, n.d.).

In summary, it can be established that operational capacity is determined by three mutually reinforcing conditions: security, professional management, and community legitimacy. When all three are simultaneously fulfilled (observable in Benin and Chad), the ecological and economic performance of the nature conservation system measurably improves. If any critical element is missing or compromised (as demonstrated by the cases of Mali, Burkina Faso, and partially Niger and Nigeria), the parks are unable to perform actual nature conservation functions despite legal designation.

### *3. The Role and Impact of African Parks*

The functioning of national parks in the Sahel region depends to a considerable extent on support from international organisations. Among these, African Parks stands out, having become a defining actor in the region's nature conservation over the past two decades (African Parks, n.d.). The organisation's distinctive model is built upon state and civil cooperation. Within the framework of long-term management agreements, it provides not only financial and technical support but also assumes comprehensive professional direction (African Parks, 2023–2025). This approach represents a breakthrough particularly in locations where national institutions are weak or partially dysfunctional, yet political leadership possesses the willingness for international partnership. The African Parks model rests upon three pillars:

**Professional management:** the organisation directly manages the parks, assuming responsibility for tasks frequently left unperformed by state structures.

**Community participation:** surrounding villages and residents are involved in decision-making processes, and a portion of park revenues is allocated to development projects.

**Long-term financing and the international network** signifies that park maintenance does not rest upon a single source but rather on coordinated support from various donors, international NGOs (e.g., African Parks, WWF, WCS), and state partners. This multi-pillar model ensures operational stability even within an unstable political and security environment (WCS Nigeria, n.d.).

Zakouma National Park in Chad represents one of the model's most iconic examples. In the early 2000s, the elephant population underwent a dramatic collapse as a consequence of poaching, declining from approximately 20,000 individuals in the 1980s to fewer than 450 by 2010. The situation was exacerbated by the fact that rangers were powerless due to lack of equipment and support, and communities were often driven to the poachers' side by livelihood pressures. Following African Parks' entry in 2010, however, a comprehensive reform commenced. The organisation strengthened the

ranger force (while their number was below 100 in 2010, more than 300 trained rangers were performing duties by 2023) and introduced modern technologies (employing GPS-based tracking, radio networks, and drones) (African Parks, n.d.). The results are tangible: the documented elephant population grew from approximately 450 individuals to over 650 between 2010 and 2020, and losses stemming from poaching decreased radically. By 2023, the population had stabilized, and a new growth trend had begun, marking one of the most successful conservation turnarounds in the region. Community cooperation also gained new momentum, as schools, health centers, and irrigation projects were launched in the surrounding villages. Ecotourism, which had nearly disappeared in the 2000s, gradually restarted after 2017, and the park once again appeared on the international safari map. Today, Zakouma stands as one of the most successful conservation examples in the Sahel region. (African Parks, n.d.)

A similar process transpired in Benin, where African Parks assumed management of Pendjari and W National Park in 2017 (African Parks, 2023–2025). These two parks are home to West Africa's last significant large predator populations, including lions, cheetahs, and leopards. Growth was perceptible in tourism: from 2018 onwards, Pendjari became one of West Africa's rare ecotourism destinations, though security risks continue to strongly influence visitor numbers. In 2024, African Parks recruited an additional 50 rangers in Benin, including women. This not only strengthens security presence but also represents a milestone from the perspective of gender equality, as women, who previously played a marginal role in conservation, now directly participate in park maintenance. This step symbolically strengthens both community involvement and modernisation. (CENAGREF, n.d.)

The African Parks model, however, is sensitive to the security environment. In the WAP complex, on the Burkinabe and Nigerien sides, the consolidation of armed groups has virtually eliminated state presence. Park infrastructure (watchtowers, bases, communication posts) has been destroyed, and the area is being utilised as a logistical base, supply line, and recruitment site. In the Beninese section, although African Parks management has achieved numerous results, armed infiltration is increasingly intense here as well. Militant groups collect taxes from herders, control illegal logging and gold mining, and utilise the park's territory as a commercial route. The trust deficit experienced in the W region is also documented in detail by the Crisis Group's 2023 interview-based report, specifically highlighting tensions arising from the absence of communication channels between park management and communities in peripheral zones. This dual pressure — the tension between conservation efforts and armed influence — continuously threatens the progress that has been achieved. (International Crisis Group, 2023)

The experiences are unequivocal: professional management alone is insufficient. The condition for sustainability is the continuous strengthening of local communities' trust, as well as transparency in benefit-sharing. According to village interviews recorded by the Crisis Group, many villagers do not perceive that revenues deriving from the park directly improve their living conditions (International Crisis Group, 2023). This mistrust



easily plays into the hands of armed groups, which frequently offer alternative (albeit illegal) livelihoods. African Parks has therefore established peripheral zone committees, where community representatives can directly provide feedback to management. The purpose of these bodies is to maintain dialogue and manage conflicts peacefully, though their long-term impact remains unclear.

The role of African Parks is thus dual in nature. On the one hand, it is capable of bringing stability, expertise, and development; on the other hand, its functioning is heavily dependent upon the security environment. The examples of Zakouma and Pendjari demonstrate that wildlife conservation and ecotourism can be restored even under unfavourable conditions, but lasting results can only be achieved if local communities receive genuine participation in the benefits and armed threats can be mitigated (PNBA, n.d.). The region's experiences also confirm that alongside "hard" factors (rangers, technology, financing), "soft" elements (trust, dialogue, local participation) are indispensable. Interviews conducted with WAP-Benin peripheral communities likewise indicate that the visibility of benefit-sharing and continuous communication are key to operational capacity. Overall, the experiences of African Parks demonstrate that long-term mandate, stable financing, community involvement, and professional management are collectively capable of bridging the gap between legal designation and actual field functioning. Whilst this model does not guarantee success, where political and security conditions are partially given, it has proven to be the most viable nature conservation solution in the region.

#### *4. The Impact of Security Conditions on National Park Operations*

The functioning of national parks in the Sahel region is fundamentally determined by the security environment, which has deteriorated dramatically over the past decade and a half. Based on the ACLED database, between 2009 and 2024, the number of armed incidents more than quadrupled. Whilst in 2010 approximately 300 documented armed events occurred in the region, by 2023 this figure exceeded 1,200 (ACLED, n.d.). This quantitative leap is not merely a statistical datum but signifies the impossibility of the parks' daily operations.

The territorial expansion of armed groups is closely intertwined with the geographical characteristics of parks. Large, sparsely populated, and difficult-to-control areas provide ideal hinterlands for militant networks. In Nigeria, for instance, Boko Haram and ISWAP utilise protected areas near Lake Chad as military bases and taxation centres, rendering parks that are crucial for bird migration essentially non-functional (WCS Nigeria, n.d.; BirdLife International, n.d.; International Crisis Group, 2023). In Mali and Burkina Faso, local Al-Qaeda organisations and other jihadist coalitions have assumed control over eastern and northern parks, with targeted attacks on ranger stations and systematic infrastructure destruction (International Crisis Group, 2023; Africa Center for Strategic Studies, 2025). In Niger, armed militias and smuggling networks similarly exploit sparsely controlled border areas (International Crisis Group, 2023).

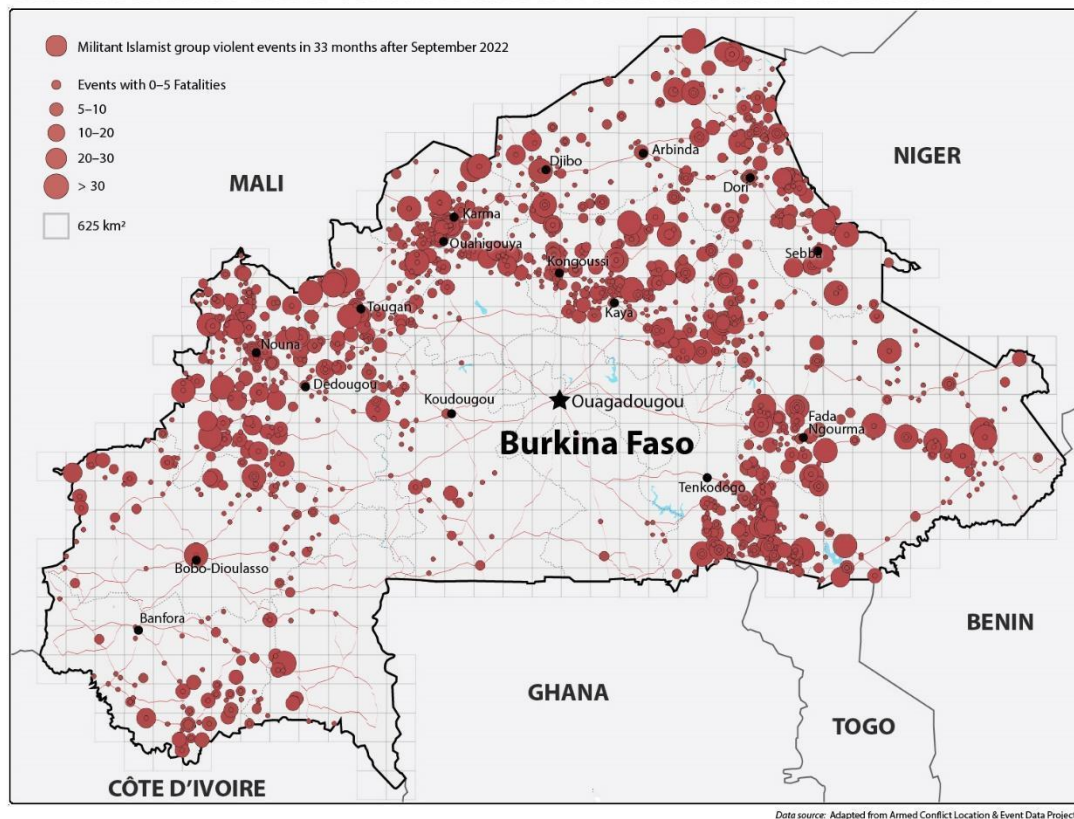
The consequences are immediate and severe. The cases of Burkina Faso and Mali aptly illustrate the processes. In both countries, the eastern and northern parks, including sections of the WAP complex, have become virtually inaccessible. Rangers often work under life-threatening conditions, visitor traffic has ceased, and nature conservation activity has become practically impossible (International Crisis Group, 2023). In Mali, the central state's weakness and the series of coups led to the collapse of the nature conservation system, whilst in Burkina Faso, direct attacks by armed groups resulted in the withdrawal of rangers and the destruction of infrastructure. In the Burkinabe section of the WAP complex, between 2019 and 2023, more than twenty targeted attacks were executed against ranger stations, in which numerous nature conservation professionals also lost their lives (International Crisis Group, 2023; Africa Center for Strategic Studies, 2025).

The cartographic representation shown in Figure 1 clearly demonstrates that Burkina Faso's violence pattern after September 2022 intensifies towards the east-northeast and northwest, whilst the southeastern border zone (towards Benin and Togo) likewise exhibits continuous exposure. In the northern triangle (Djibo–Arbinda–Dori–Sebba area), the larger circles indicate the concentration of more severe events involving multiple fatalities, which is consistent with the drastic withdrawal of state presence and border permeability. Eastward, towards Fada N'Gourma and the periphery of WAP, a corridor-like distribution becomes apparent. In the west and southwest (Bobo-Dioulasso and the Côte d'Ivoire border zone), smaller but extensive clusters indicate a second front linked to internal mobility routes and more densely populated zones. The environs of Ouagadougou are relatively sparse but not free from events; the "protective effect" of the capital rapidly dissipates with distance. The map thus provides field evidence for the finding that national parks (particularly WAP) have become strategic zones where nature conservation operations directly collide with the presence of armed actors (ACLED, n.d.; Africa Center for Strategic Studies, 2025).

The figure is based on ACLED events, with violent event types (combat actions, explosions, violence against civilians) linked to actors categorised under "militant Islamist group," and displays events from the 33 months following September 2022. Point-based data are represented with bubble symbolism; the size of circles reflects the magnitude of the number of casualties. Concentrations (particularly at the WAP periphery and in the northern triangle) indicate the presence of high-risk zones from a field operations perspective (ACLED, n.d.).



### MILITANT ISLAMIST GROUP VIOLENT EVENTS AND FATALITIES AFTER SEPTEMBER 2022

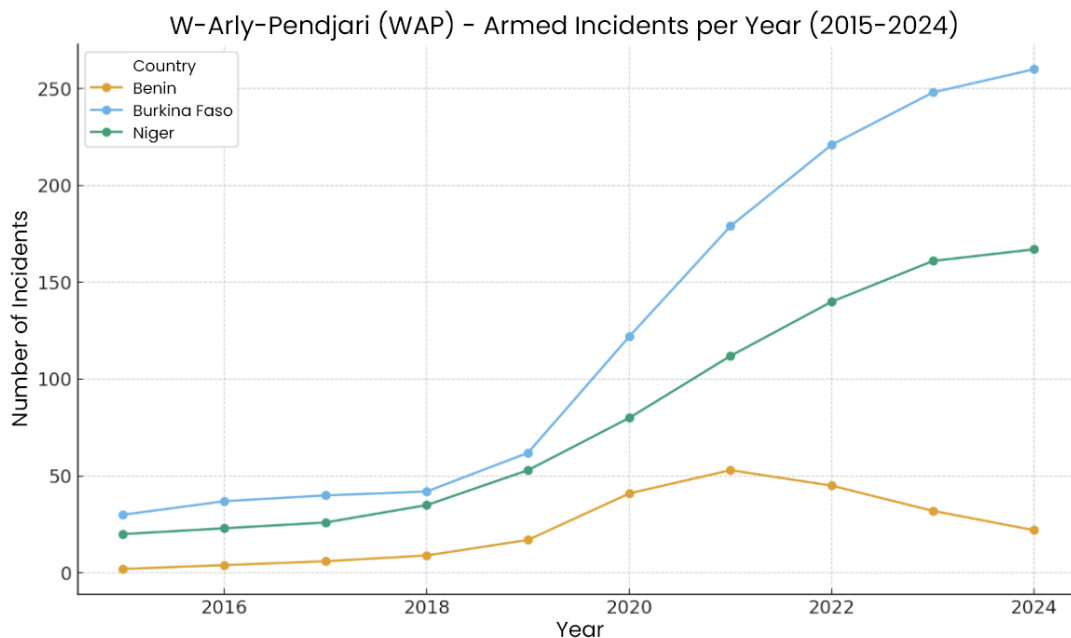


*Figure 1: Distribution of violent incidents and fatalities linked to militant Islamist groups in Burkina Faso.*

A similar process has transpired in Nigeria. In the northern regions, due to Boko Haram attacks, protected areas near Lake Chad (such as Chad Basin National Park) have become non-functional. These parks ought, on paper, to have protected one of the most important nodes of bird migration, but in practice are now abandoned and uncontrollable. Boko Haram not only utilises parks as military bases but also collects taxes from fishermen and herders, controls transportation routes, and illegal timber and wildlife trade frequently occurs within park territories (WCS Nigeria, n.d.; BirdLife International, n.d.). The deterioration of the security situation is particularly striking in the Park W region. The area situated on the border of Benin, Burkina Faso, and Niger has become one of the most important bases of jihadist groups in recent years. The park's geographical location (borderland with extensive forested and savanna areas) provides an ideal hinterland for armed groups. Park W now functions not merely as a hideout but as a logistical centre and recruitment site. Militant groups collect taxes from herders, control gold mining, participate in cattle trade, and direct illegal logging and poaching, thereby placing dual pressure on nature conservation systems. On the one hand, it renders the work of rangers and professionals impossible; on the other hand, it creates economic pressure situations for local communities, for whom cooperation with armed groups is often the sole survival option (International Crisis Group, 2023). These



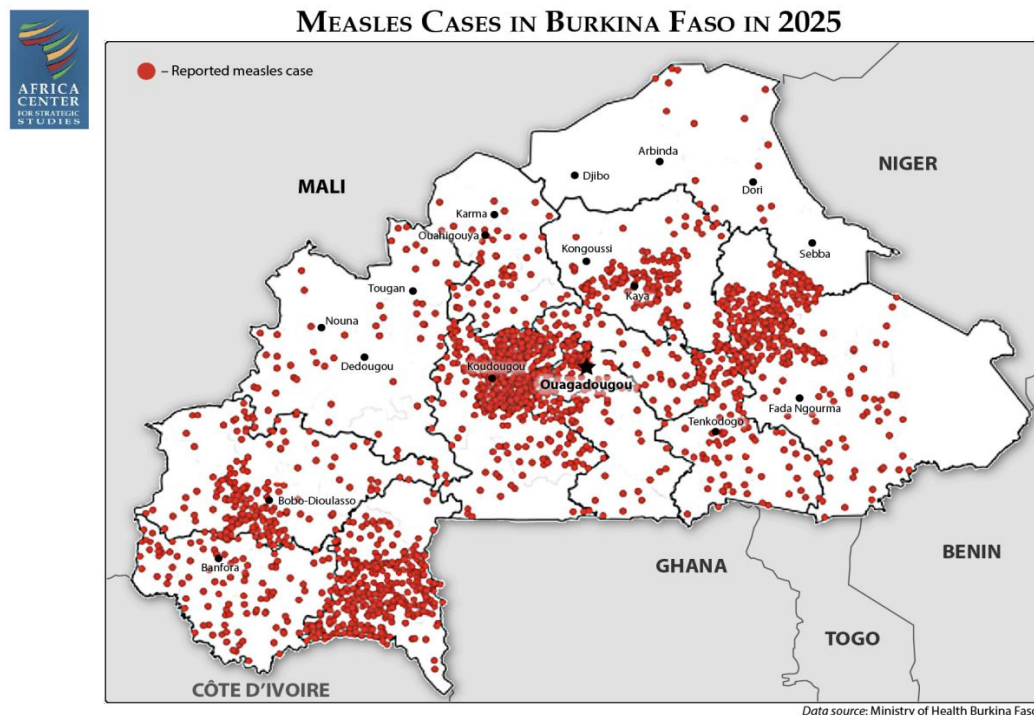
tendencies are also corroborated by the Africa Center for Strategic Studies' 2025 maps and indicators analysing Burkina Faso in detail, which document the concentration and southeastern expansion of attacks (Africa Center for Strategic Studies, 2025). The geographical extent of the conflict has undergone conspicuous transformation over the past decade. In the early 2010s, armed attacks concentrated primarily on northern Nigeria. Since then, however, the crisis has gradually extended between 2022 and 2024, several dozen documented incidents occurred directly within or in the immediate vicinity of national parks (ACLED, n.d.; International Crisis Group, 2023). This demonstrates that parks are not merely guardians of natural values but also strategic theatres of armed conflicts. Figure 2 aptly illustrates this process using the example of the WAP complex. The exponential increase in the number of incidents clearly shows how the nature conservation area became a base and supply route for armed groups, particularly in the territories of Burkina Faso and Niger.



*Figure 2: Armed incidents in the W-Arly-Pendjari region (2015–2024).*

All of this clearly demonstrates that nature conservation in the Sahel region cannot be separated from security policy. For the sustainable operation of parks, classical nature conservation tools—such as ecological monitoring, species protection programmes, or infrastructure development—are insufficient. A complex approach is required that combines public security measures, support for local communities, and the continuous presence of international partners. Experience indicates that where it has been possible to coordinate these factors (such as in certain parks in Benin and Chad), wildlife conservation and ecotourism have become sustainable even within an unstable environment (International Crisis Group, 2023). Where security risks dominate, however, national parks transform not into nature conservation centres but into strongholds of armed groups (Africa Center for Strategic Studies, 2025).

If we compare the distribution of violent events and fatalities linked to militant Islamist groups in Burkina Faso, as shown in Figure 1, with the 2025 data, it is clear from the two figures that the increasing Islamist presence does not improve the situation in the region. It is no wonder there is no development; we cannot speak of the traditional functioning of national parks, and no positive change in tourist arrivals can be expected.



*Figure 3: Distribution of violent incidents and fatalities linked to militant Islamist groups in Burkina Faso.*

### **5. Tourism and Economic Dimensions**

One of the most important long-term possibilities for the maintenance of national parks is ecotourism, which has demonstrably constituted a significant revenue source in numerous regions worldwide, and in many places represents one of nature conservation's principal financial pillars. Tourism's contribution is measurable not only in the direct revenues of parks but also in the broader economic multiplier effect, as local services, accommodations, handicrafts, and transport all profit from it (UNWTO, n.d.). The development of the Sahel region is primarily constrained by two factors: security instability and infrastructural deficiencies, which render many areas inaccessible or impede the creation of the basic prerequisites for international tourism. These factors together result in most parks being incapable of generating revenue in a self-sustaining manner, and their continued existence is largely donor-dependent (African Parks, n.d.; EEAS, n.d.; GIZ, n.d.). Financial support often covers only the basic operational costs, which does not ensure development or sustainability in the long term. Therefore, the potential of tourism is a strategic issue, as it can offer an alternative to exclusive dependence on external funding. (UNWTO, n.d.)

Significant differences can be observed among the countries of the region in tourism development possibilities and results. Positive examples include Benin and Chad, where tourism capacities have expanded through international partnerships. Accommodations, visitor centres, and safari programmes have been established, which have made these areas attractive once more to international tourists (African Parks, 2023–2025). In Chad, Zakouma National Park constitutes a success story not only in the suppression of poaching but also in the gradual recommencement of tourism following African Parks' intervention (African Parks, n.d.). In Benin, from 2018 onwards, Pendjari became one of West Africa's rare ecotourism destinations, and revenues derived from tourism are also allocated to community development projects, strengthening the commitment of local residents. However, the 2019 kidnappings and the 2022 armed attacks caused a drastic decline in international visitor numbers, thus the restoration of confidence promises to be a longer process (African Parks, 2023–2025).

Mauritania's case, by contrast, demonstrates that outstanding ecological significance alone does not guarantee tourism utilisation. The Parc National du Banc d'Arguin is a globally outstanding bird migration site, serving as a key resting and feeding place for millions of migratory waterfowl. However, due to poor infrastructure, limited international promotion, and difficult accessibility, visitor numbers remain persistently low, park revenues are minimal, and maintenance relies largely on external sources (PNBA, n.d.; Ramsar Secretariat, n.d.). The example of Banc d'Arguin thus demonstrates that outstanding ecological value does not create sustainable financing if tourism embeddedness is lacking.

In the cases of Mali, Burkina Faso, and Nigeria, tourism has virtually ceased due to the security situation. Armed attacks, kidnappings, and transportation risks prevent both international and domestic tourists from appearing in the parks (International Crisis Group, 2023). This is particularly conspicuous, as in Mali the Dogon Plateau or in Burkina Faso the WAP complex were previously well-known stations of West African cultural and nature conservation tourism. However, armed activity after 2010 has virtually eliminated them from the tourism map.

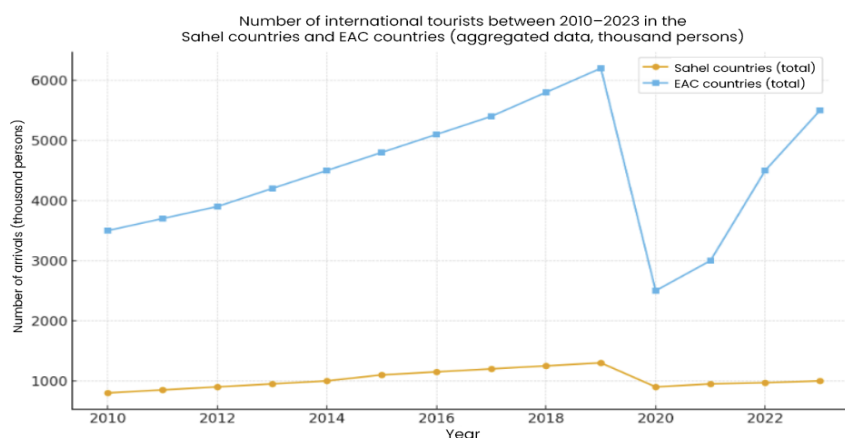
Niger likewise possesses significant but unexploited possibilities. The ecological values of W National Park and the Termit–Tin-Toumma Reserve would theoretically represent substantial tourism appeal, as they are habitats for rare species that are scarcely to be found elsewhere in West Africa. However, the absence of stability, weak transportation infrastructure, and international image impede these potentials from generating actual revenue (UNEP–WCMC & IUCN, n.d.; International Crisis Group, 2023).

The economic significance of tourism is well illustrated by comparison with the countries of the East African Community (EAC). In Kenya, Tanzania, and Uganda, national parks represent one of the driving sectors of GDP, attracting several million visitors annually, and the multiplier effect of tourism is several times the direct revenues (UNWTO, n.d.). The Serengeti, Kilimanjaro, or Maasai Mara have become global icons generating broad social and economic benefits, and are continuously present in the world's travel offerings through international tourism campaigns.

The statistics also clearly demonstrate the chasm between the two regions. The combined international visitor numbers of Sahel countries have moved around merely a few hundred thousand annually over the past decade, and have frequently declined due to security crises. By contrast, the EAC countries (particularly Tanzania and Kenya), according to UNWTO data, received a total of 6.2 million tourists in 2018 (Tanzania 1.5 million, Kenya 2 million, Uganda 1.8 million), and following the post-COVID-19 pandemic decline, rapidly recovered by 2023, with 5.8 million visitors (UNWTO, n.d.). No substantive recovery occurred in the Sahel because the security situation continued to deteriorate, thus the crisis in tourism represents not a temporary but rather a lasting obstacle (ACLED, n.d.; UNWTO, n.d.). This difference does not stem from natural endowments, as the parks of Sahel countries likewise possess globally significant ecological values. However, weak institutional capacity, inadequate infrastructure, an unfavorable international image, and security risks prevent these areas from generating tourism revenue. (UNWTO, n.d.; UNEP-WCMC & IUCN, n.d.)

Ecotourism thus simultaneously represents both opportunity and risk in the Sahel region. Opportunity, because it can contribute over the long term to the self-sustainability of parks, the welfare of local communities, and regional stability. Risk, because it is only realistic where security conditions, professional management, and adequate infrastructure converge. The examples of parks managed through international partnerships demonstrate that initiating tourism is not impossible even in an unstable environment, but its sustainability requires the stabilisation of the security situation, the strengthening of community participation, and the continuation of long-term international support (African Parks, 2023–2025; International Crisis Group, 2023).

The economic significance of tourism is illustrated by Figure 3, which compares the evolution of visitor numbers in Sahel countries and the East African Community over the past decade. It is readily apparent that public security directly determines tourist traffic: where stability exists (such as in Tanzania and Kenya), visitor numbers are in the millions, whilst in the Sahel the security crisis maintains numbers at a persistently low



level.

*Figure 4: Number of inbound tourists in Sahel countries and EAC countries, 2014–2023.*

## *6. Size and Proportion of Protected Areas*

The extent and proportion of protected areas constitutes an important indicator, as it reveals the degree to which individual countries are capable of setting aside land area from their resources for nature conservation purposes. However, figures alone can be misleading, as the designated area does not necessarily signify actual functioning. In the Sahel region, numerous countries have designated enormous protected areas on paper, yet their actual protection, institutional embeddedness, and community support are frequently limited. Precisely for this reason, the "paper park" phenomenon is particularly emphatic here, and in the course of comparison, the differences between *de jure* and *de facto* functioning became the most important considerations (UNEP–WCMC & IUCN, n.d.; International Crisis Group, 2023).

Niger provides the most conspicuous example of this contradiction. Both the Termit and Tin-Toumma Reserve (97,000 km<sup>2</sup>) and the Aïr–Ténéré Reserve (77,000 km<sup>2</sup>) are of enormous extent, and on paper result in a significant portion of the country's territory being under protection. At first glance, these figures might suggest that Niger is one of the region's leading nature conservation states. Reality, however, is precisely the opposite. Due to weak institutional presence, the absence of community involvement, and the presence of armed groups and illegal economic activities, these reserves scarcely function as actual nature conservation units. The control of these vast areas simply exceeds the state's capacities, thus designation is often more symbolic than a practical step (UNEP–WCMC & IUCN, n.d.; International Crisis Group, 2023).

Mauritania's coastal ecosystems likewise exhibit duality. Banc d'Arguin (12,000 km<sup>2</sup>) and Diawling National Park are of crucial importance from the perspective of global bird migration and safeguarding ecologically unique systems. However, their maintenance relies largely on external donors, as ecotourism revenues are minimal (PNBA, n.d.; Ramsar Secretariat, n.d.). The traditional sustainable fishing practices of the local Imraguen fishing communities constitute a positive example of community participation; however, the absence of economic autonomy renders the system vulnerable to fluctuations in international support (PNBA, n.d.; Ramsar Secretariat, n.d.).

Chad possesses medium-sized but ecologically outstanding parks. Zakouma (3,000 km<sup>2</sup>), Siniaka-Minia (4,260 km<sup>2</sup>), and Sena Oura (735 km<sup>2</sup>) collectively constitute an important link in the protection of the region's biodiversity. Although their proportion at a national level is not outstanding, the management model (the involvement of African Parks) has resulted in these areas fulfilling actual nature conservation functions (African Parks, n.d.). The example of Zakouma also demonstrates that a relatively small area can become of regional significance if functioning is actual and effective.

In Benin's case, Pendjari (2,755 km<sup>2</sup>) and the Beninese section of W National Park (5,000 km<sup>2</sup>) provide the country's northern ecological corridor. Based on WDPA data, these together cover approximately 6.9% of the country's territory, which is a particularly high proportion for a small country (UNEP–WCMC & IUCN, n.d.).





However, the difference is not merely constituted by the figures but by the fact that actual functioning stands behind the designation here. Professional management and community involvement have created a system that has achieved measurable nature conservation results, for instance in the stabilisation of lion and elephant populations (UNEP–WCMC & IUCN, n.d.; African Parks, 2023–2025). Benin thus exemplifies how territorial proportion and operational capacity can mutually reinforce each other to produce results.

Mali and Burkina Faso likewise possess, on paper, park networks of significant extent. Boucle du Baoulé, Arly, or the Burkinabe sections of the WAP complex would safeguard outstanding ecological values. However, due to armed conflicts, these parks have remained largely uncontrolled. Infrastructure has been destroyed in many places, rangers have withdrawn, and the territories are being utilised by armed groups as bases (International Crisis Group, 2023). Here, the proportion of protected areas is thus misleading because nature conservation has virtually ceased at an actual level.

Nigeria, Africa's most populous state, maintains protected areas at a surprisingly low proportion—according to WDPA, merely 6.4% (approximately 45,000 km<sup>2</sup> out of 923,769 km<sup>2</sup>) (UNEP–WCMC & IUCN, n.d.). This is a modest figure in regional comparison and highlights the low priority accorded to nature conservation in national policy. Gashaka-Gumti and Yankari still count as relatively active, but the remaining parks function in a fragmented manner, and in the northern regions many areas are virtually inaccessible due to armed conflict (UNEP–WCMC & IUCN, n.d.; WCS Nigeria, n.d.; BirdLife International, n.d.; International Crisis Group, 2023). Nigeria's example aptly demonstrates that high population density and security risks together constrict the room for manoeuvre in nature conservation. Several analyses by the Crisis Group likewise emphasise that proportions of protected areas alone do not provide a complete picture of the actual state of nature conservation. As the example of the WAP complex also demonstrates, different security and institutional conditions within the same ecological corridor can lead to radically different outcomes.

The situation of Sahel countries merits comparison with EAC data. Nearly one-third of Tanzania's territory, over 15% of Uganda's, and approximately 10% of Kenya's are under the protection of national parks or reserves. In these countries, designated areas are not merely legal categories but actually functioning systems with stable institutional backing, extensive tourism connections, and broad international embeddedness (UNEP–WCMC & IUCN, n.d.; UNWTO, n.d.). The Serengeti or Maasai Mara are not only biodiversity conservation spaces but also economic engines ensuring the livelihoods of millions. Figure 4 illustrates the differences between the two regions. Whilst in the majority of Sahel countries the proportion of designated protected areas moves around 6–9% (with the exception of Niger), in the EAC countries a considerably larger proportion is accompanied by more stable institutional background and tourism utilisation.

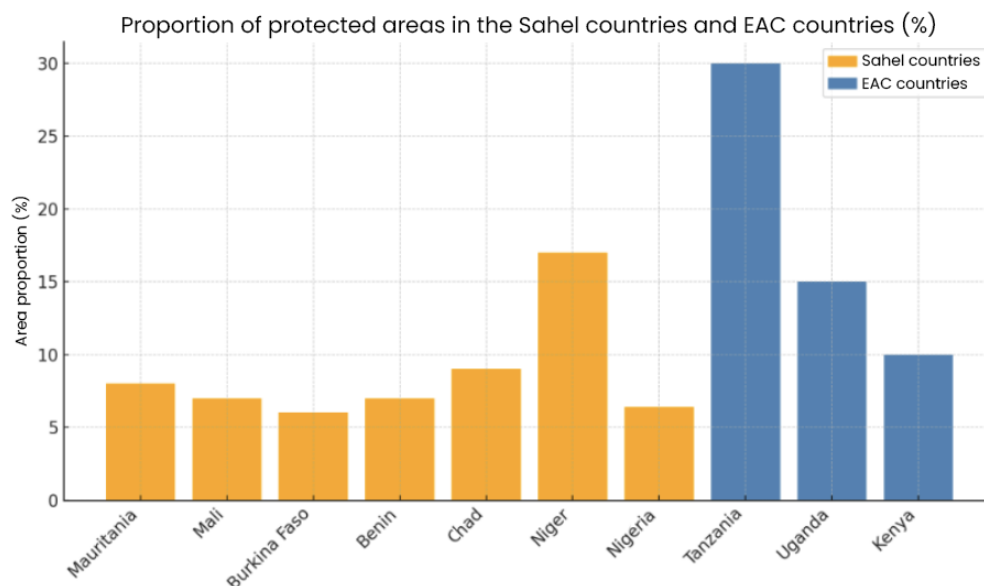


Figure 5: Proportion of protected areas relative to total land area in Sahel and EAC countries.

The difference between the two regions thus manifests primarily not in the magnitude of designated protected areas but rather in their operational capacity and economic utilisation. Whilst in East Africa, smaller proportions of designated areas actively contribute to state revenues and tourism, in the Sahel vast protected areas often exist merely on paper, and in practice provide little protection for biodiversity (UNWTO, n.d.; UNEP–WCMC & IUCN, n.d.; International Crisis Group, 2023). An illustrative summary of the differences is provided by Table 1, which contains the key indicators of the examined Sahelian countries in a single location.

Country	Protected area ratio (%)	Tourist numbers (thousands)	Armed incidents in PA (2015–2023, average/year)	African Parks presence	Remarks
Mauritania	approx. 8%	< 50	low	none	coastal focus
Mali	approx. 7%	n.a.	high	none	coastal focus
Burkina Faso	approx. 6%	0	very high	none	WAP collapse
Benin	approx. 7%	approx. 250	medium-rising	2017-	Pendjari, W

Chad	approx. 9%	approx. 80	medium	2010-	Zakouma success story
Niger	approx. 17%	approx. 100	high	none	large expanse on paper
Nigeria	approx. 6%	approx. 500	high	none	fragmented system

*Table 1: Key indicators of Sahel countries.*

Protected area ratios based on WDPA, the magnitude of inbound tourism on UNWTO time series, whilst annual averages of armed incidents registered in and around the immediate periphery of protected areas for 2015–2023 based on the ACLED database. The remarks column records the context of operational capacity (such as African Parks presence, infrastructure

## *7. Challenges and Opportunities*

The future of national parks in the Sahel region depends upon numerous interconnected factors. The challenges are multifaceted and are not only ecological in nature but are closely linked to the social, economic, and security environment. Parks are not isolated ecological islands but rather integral parts of the broader socio-political system, thus their vulnerabilities and possibilities likewise stem from this (UNEP, 2015; International Crisis Group, 2023; ACLED, n.d.). However, the possibilities are tangible, as where international partnerships, community participation, and security stability converge, parks can become engines of development (African Parks, 2023–2025; UNWTO, n.d.). Climate change and desertification constitute one of the Sahel's most pressing problems. Precipitation distribution is becoming increasingly uneven, dry periods are lengthening, water sources are gradually disappearing, and vegetation zones are shifting northward. This directly affects the wildlife of parks: large-bodied mammals are compelled to travel increasingly great distances for water, which increases mortality and the risk of population fragmentation (UNEP, 2015; UNCCD, n.d.). The disruption of ecological corridors can lead to rapid decline, whilst fragmentation intensifies conflicts between humans and wild animals as well, as direct competition develops for shrinking resources. In certain parks (such as Diawling, Mauritania), changes in water management also artificially influence the condition of habitats, which engenders fresh tensions amongst the local population (Ramsar Secretariat, n.d.).

Poaching continues to constitute a severe threat. The illegal hunting of large game, particularly elephants, rhinoceroses (rarer in the region but regionally relevant), and big cats, not only causes ecological damage but also provides significant revenue sources for armed groups. The prey frequently does not reach local markets but rather arrives in Asia or the Middle East through international commercial networks, indicating global

interconnection (CITES, n.d.; IUCN Red List, n.d.). The example of Zakouma demonstrates that poaching can be suppressed through intensive international intervention and professional management (African Parks, n.d.), but where state presence is weak, the process remains virtually uncontrolled, as in the cases of Mali or Burkina Faso (International Crisis Group, 2023).

Territories controlled by armed groups impede the functioning of nature conservation units in multiple ways. On the one hand, they pose a direct security threat to rangers and researchers; on the other hand, they construct their own shadow economy within the parks. Illegal logging, gold mining, cattle trafficking, and poaching generate significant revenue for militant groups whilst simultaneously destroying ecological values. Parks thus become not merely hideouts but economic resource bases where armed actors establish parallel governance structures. This undermines both state authority and the legitimacy of nature conservation institutions (International Crisis Group, 2023; Africa Center for Strategic Studies, 2025).

The relationship between local communities and parks is often fraught with tension. Many villagers experience the park as a restriction, as protected status impedes traditional livelihood forms (grazing, logging, fishing). If they do not perceive direct benefits (for instance from tourism, development projects, or revenue sharing), they will not be interested in the preservation of parks. This is particularly perilous in conflict zones, where armed groups offer rapid, albeit illegal, yet immediate alternatives. Positive counterexamples include Mauritania, where the involvement of the Imraguen community has created a sustainable model, or Benin, where a portion of Pendjari park revenues are allocated to community projects (PNBA, n.d.; African Parks, 2023–2025; Ramsar Secretariat, n.d.). These demonstrate that without social legitimacy, lasting nature conservation results cannot be achieved (CBD, n.d.; CMS, n.d.).

Despite the difficulties, the parks of the Sahel region harbour significant potential. Models introduced by African Parks and other international organisations have proven that the combination of community participation and professional management can yield functioning systems. The successes of Zakouma and Pendjari demonstrate that even in unstable environments, nature conservation and tourism results can be created if the involvement of local communities and international support are secured over the long term.

Further opportunity is offered by cross-border cooperation. The example of the WAP complex clearly demonstrates that nature conservation objectives can often only be achieved within regional frameworks. Cooperation among the three countries (Benin, Niger, Burkina Faso) is currently fragmented, but can only be successful over the long term if they construct common mechanisms and involve local communities in conflict management as well. Regional coordination could be strengthened by international programmes such as the UN biodiversity framework or African Union green infrastructure strategies.

Among the opportunities, mention should be made of the long-term potential of ecotourism, which, within an appropriate security environment, can strengthen not only

park maintenance but also local economies through its multiplier effect (UNWTO, n.d.). International climate financing mechanisms (such as REDD+ programmes, carbon market initiatives) can offer new revenue sources for nature conservation units (UNFCCC, n.d.; UNCCD, n.d.). Over the long term, investment in the education and training of younger generations (such as ranger schools, nature conservation scholarships) can likewise be a key factor in creating social legitimacy. Finally, the integration of cultural heritage (for instance, the joint presentation of the Dogon Plateau and Sahelian parks) can create a new, complex tourism offering that simultaneously builds upon natural and cultural values (UNWTO, n.d.).

The duality of challenges and opportunities determines the parks of the Sahel region. The key to success is the simultaneous fulfilment of three conditions: security stability, community involvement, and the long-term presence of international partners. If the factors converge, parks can become not merely ecological islands but engines of the region's social and economic development. However, if the security threat, institutional weakness, and community mistrust simultaneously prevail, the survival of parks remains uncertain (International Crisis Group, 2023; ACLED, n.d.; African Parks, 2023–2025).

## 8. Conclusion

The comparative analysis of national parks in the Sahel region has revealed that alongside common challenges, country-by-country differences are at least equally determinative. Whilst natural-geographical and ecological endowments exhibit numerous similarities, the actual operational capacity of parks is primarily a function of political stability, institutional capacities, security situation, and community participation combined. This explains why the same ecological corridors have followed different development trajectories: in Benin, management change after 2017 initiated development; in Burkina Faso, armed activity after 2020 led to collapse; whilst in Niger, weak institutional background has kept the de facto functioning of designated areas limited. The picture is thus mosaic-like, and in each country challenges and opportunities manifest in different combinations.

The analysis has identified three conditions as keys to success. The first is a stable security environment, without which neither protection, nor tourism, nor community participation can be sustained. The second is functioning institutional background, which is capable of coordinating international support, ensuring transparent management, and maintaining protective capacities. The third is community participation, which confers legitimacy upon the functioning of parks and renders the local population stakeholders in nature conservation objectives. The three factors do not substitute for one another but rather, through mutual reinforcement, can create a sustainable nature conservation system.

Comparison with the countries of the East African Community clearly demonstrates the differences. Whilst the national parks of Tanzania, Kenya, and Uganda have become engines of tourism and the economy, in the Sahel region the actual functioning of numerous parks is weak and often appears merely as a legal category. The difference



does not reside in ecological values but rather in security, institutional, and economic factors. In East Africa, stability, institutional background, and conscious tourism image-building have collectively created the conditions for parks to become pillars of tourism sectors contributing significant proportions of GDP (certain estimates suggest 8–12%). In the Sahel, by contrast, in many cases even basic functioning depends upon external donors, which renders long-term sustainability uncertain.

Nature conservation in the Sahel therefore cannot be reduced to an ecological question. Parks also possess social and security-political functions: they can contribute to the stabilisation of communities, offer alternative livelihood forms, and mitigate risks arising from armed conflicts. This is of particular significance in those states where other public institutions are weak or absent, and parks remain the sole actually functioning public service. The examples of Zakouma, Pendjari, or the Imraguen community all demonstrate that nature conservation can be successful when ecological, social, and economic dimensions appear in an integrated fashion.

Overall, nature conservation in the Sahel can only be effective through a comprehensive approach coordinated at multiple levels. Parks are organic parts of the region's social, economic, and political fabric, and their sustainability cannot be separated from broader development and security strategies. If this recognition becomes institutionalised, parks can become in the future not merely refuges for biodiversity but central elements of stability and development. The most important question in the coming decade is whether it will be possible to moderate the intensity of armed conflicts and ensure the continuity of international support. If the three key factors (security stability, institutional capacity, and community participation) are simultaneously fulfilled, by 2030 the parks of the Sahel may become not examples of vulnerability but rather institutionalised examples of resilience.

### *Notes on Contributor*

Timea Hillender is a Hungarian professional with a diverse background in education and humanitarian work. She graduated from the University of Szeged with a degree in Hungarian and German teaching, and later obtained a master's degree in German translation from the University of Miskolc. Seeking to broaden her expertise, she completed a second master's degree in Humanitarian Response Management at Bánki Donát Faculty of Mechanical and Safety Engineering, Óbuda University, where her thesis focused on the innovative use of giant pouched rats in landmine detection. She is the founder and president of Afrika Sztorik Afrika Vadvilágáért Egyesület, an association active in Kenya and Tanzania. Through the organisation's programmes, she supports women's training and education, including ranger courses and tour guide certification, with the aim of strengthening communities and promoting sustainable development. Since 2023, she has also been working with APOPO, an international NGO renowned for its mine-detection rats. Her current work focuses on empowering women to participate in the breeding and training of these animals, thereby promoting greater female involvement in humanitarian demining efforts.

### *Conflict of Interest*

The authors hereby declare that no competing financial interest exists for this manuscript.

#### **List of International Agreements and Programmes**

- **CITES** (*Convention on International Trade in Endangered Species of Wild Fauna and Flora*)
- **CBD** (*Convention on Biological Diversity*)
- **CMS** (*Convention on the Conservation of Migratory Species of Wild Animals*)
- **Ramsar** (*Convention on Wetlands of International Importance especially as Waterfowl Habitat*)
- **UNFCCC** (*United Nations Framework Convention on Climate Change*)
- **Paris Agreement** (*Paris Agreement under the UNFCCC*)
- **UNCCD** (*United Nations Convention to Combat Desertification*)
- **AP** (*African Parks Network*)
- **PAPACO** (*Programme on African Protected Areas & Conservation*)
- **WAP** (*W-Arly-Pendjari Complex*) (Benin–Burkina Faso–Niger)
- **AHEAD** (*Animal Health for the Environment And Development*) (WCS program)
- **PPI** (*Programme de Petites Initiatives*)
- **IUCN** (*International Union for Conservation of Nature*)
- **WWF** (*World Wide Fund for Nature*)
- **WCS** (*Wildlife Conservation Society*)
- **GEF** (*Global Environment Facility*)

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CBD (Convention on Biological Diversity) — Convention on Biological Diversity

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Ramsar (Convention on Wetlands of International Importance especially as Waterfowl Habitat) — Ramsar Convention on Wetland Protection

UNFCCC (United Nations Framework Convention on Climate Change) — UN Framework Convention on Climate Change

Paris Agreement (Paris Agreement under the UNFCCC) — Paris Climate Agreement

UNCCD (United Nations Convention to Combat Desertification) — UN Convention to Combat Desertification

AP (African Parks Network) — African Parks network / organisation

PAPACO (Programme on African Protected Areas & Conservation) — African Protected Areas and Conservation Programme (IUCN sub-programme)

WAP (W-Arly-Pendjari Complex) — W-Arly-Pendjari ecological corridor (Benin–Burkina Faso–Niger)

AHEAD (Animal Health for the Environment And Development) — Animal health for environment and development (WCS programme)

PPI (Programme de Petites Initiatives) — Small Conservation Initiatives Programme (French support, primarily in francophone countries)

IUCN (International Union for Conservation of Nature) — International Union for Conservation of Nature

WWF (World Wide Fund for Nature) — World Wide Fund for Nature

WCS (Wildlife Conservation Society) — Wildlife Conservation Society

GEF (Global Environment Facility) — Global Environment Facility

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