

Protected Areas Resilient to Climate Change, PARCC West Africa



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Strategy and Policy Recommendations for the Best
Approaches to Plan and Manage Protected Areas for
Climate Change in Sierra Leone



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Glossary

AF	Adaptation Fund
AMF	Adaptive Management Framework
CBD	Convention on Biological Diversity
CCA	Climate change adaptation
CSSL	Conservation Society of Sierra Leone
CTF	Conservation Trust Fund
ECOWAS	Economic Community of West African Countries
EPASL	Environment Protection Agency of Sierra Leone
FBC	Fourah Bay College
GEF	Global Environment Facility
GRNP	Gola Rainforest National Park
IBA	Important Bird and Biodiversity Areas
INDC	Intended Nationally Determined Contributions
IUCN	International Union for Conservation of Nature
MAFFS	Ministry of Agriculture, Forestry and Food Security
MDG	Millennium Development Goal
METT	Management Effectiveness Tracking Tool
MFMR	Ministry of Fisheries and Marine Resources
MIALGRD	Ministry of Internal Affairs, Local Government and Rural Development;
MLCPE	Ministry of Lands, Country Planning and Environment
NAP	National Adaptation Programme
NAPA	National Adaptation Programme of Action
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non-governmental Organisation
NLO	National Liaison Officer
NPAA	National Protected Areas Act
NU	Njala University
OKNP	Outamba-Kilimi National Park
PA	Protected area
PAME	Protected Area Management Effectiveness (PAME)
PARCC	Protected Areas Resilient to Climate Change
POWPA	Programme of Work on Protected Areas of the Convention on Biological Diversity
PRSP	Poverty Reduction Strategy Paper
RAMPAO	Réseau Régionale d'Aires Marines Protégées en Afrique de l'ouest
REDD	Reducing emissions from deforestation and forest degradation
RSPB	Royal Society for the Protection of Birds
SLEPA	Sierra Leone Environmental Protection Agency

SNC	Second National Communication
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP-WCMC	World Conservation Monitoring Center of the United Nation Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
WAPF	Western Area Peninsula Forest

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Executive Summary

Sierra Leone has a rich terrestrial and aquatic biodiversity that contributes to the well-being, prosperity, economic development, spirituality, tradition and culture, health and food security of its populations. Efforts to formally protect this natural capital at the national level started a century ago with the declaration of the first forest reserves (Western Area Peninsula Forest Reserve) in 1916. Today, protected areas (PAs) occupy 4.1% of the national territory. However, they are under a lot of pressure from deforestation, changing land-use patterns, habitat degradation and fragmentation, over-harvesting, poaching, pollution, contamination and invasive alien species. It is increasingly recognized that climate change is exacerbating these pressures.

Sierra Leone has started integrating climate change considerations in its conservation work, for example through the project entitled “Conservation in the face of Climate Change: Developing an Adaptive Management Framework (AMF) for the conservation of birds and other biodiversity across Africa”. In addition, PAs are considered as important elements for climate change adaptation and mitigation measures. Projections of climate change impacts on PAs, in particular the fact that changes in temperature and precipitation as well as sea level rise may make PAs unsuitable for the species and ecosystem services that they are supposed to protect, have not yet been taken fully into consideration.

In this context, the PARCC project:

- (a) Produced future climate projections for Sierra Leone and investigated consequences on ecosystem services;
- (b) Developed species distribution models for all species of birds, mammals and amphibians for three future time periods (2010-2039, 2040-2069 and 2070-2099);
- (c) Assessed the vulnerability to climate change of all species of amphibians, reptiles, mammals, birds, and freshwater fish found in Sierra Leone (and the rest of West Africa) and produced maps of their densities and percentages;
- (d) Identified areas of the territory naturally resilient to climate change, and the percentage of these areas already included in PAs; and
- (e) Established through a systematic conservation planning system, whether a wide range of conservation features (including amphibian, bird and mammal species and ecoregions) are sufficiently protected by the existing PA network of Sierra Leone.

All these project outputs are detailed in Section 2 of this report. In order to ensure an effective uptake and use of these outputs, strategies and policy recommendations for the best approaches to the planning and management of PAs in the face of climate change were developed for each of the five pilot countries (Chad, the Gambia, Mali, Sierra Leone and Togo) and a strategy for the whole West African region. Strategic elements and policy recommendations were thus articulated around common points for the five countries so as to facilitate their aggregation in a West African regional strategy.

The proposed elements of the adaptation strategy for Sierra Leone include three strategic goals, 11 objectives and 38 specific actions. The objectives and specific actions were identified taking into account ongoing, planned or completed actions in other strategies and programmes of the country. These elements can serve as a starting point for the development of a national strategy that would govern PAs planning and management in the face of climate change.

The vision of this strategy aligns with Sierra Leone's vision for the National Biodiversity Strategy and Action Plan 2003, and its mission addresses the following three strategic areas: (i) ongoing conservation activities; (ii) the anticipation of climate change in decision-making on the creation, expansion and connection of PAs; and, (iii) the environment for a successful implementation of the strategy.

Strategic goal 1 is about strengthening ongoing conservation plans and programmes and their implementation to improve the performance of existing PAs; and finalizing the designation and/or regulation of areas identified as requiring protection, building *inter alia* on the National Protected Areas Act (NPAA) adopted in 2012 and the Conservation Trust Fund. Without protection today, the biodiversity elements that are threatened or vulnerable will have little or no chance to survive the impact of climate change. Implementation of this strategic goal will require the following:

- (a) Reviewing existing PAs and ensure their sustainable and effective management so that they can achieve the objectives for which they were created, including by developing, updating and implementing management plans;
- (b) Accelerating and completing the designation and integration in the national PA system of areas identified as requiring protection such as Lake Sonfon, one of the currently unprotected Important Bird and Biodiversity Areas, and Yawri Bay and Sherbro River Estuary;

(c) Updating the list of elements to be protected, taking into account the Sustainable Development Goals and the national strategy for poverty reduction, and conduct a gap analysis using the new list of conservation features.

Strategic goal 2 is about anticipating the impact of climate change and responding proactively to ongoing and future environmental changes, focusing on changes caused by climate change. This implies that knowledge about the observed and projected impact of climate change in Sierra Leone is increased, particularly at the local level; that areas naturally resilient to climate change and areas that are likely to include the future geographical distribution of species displaced by climate change are identified, managed effectively, restored if needed, and connected.

Strategic goal 3 covers the creation or strengthening of the enabling environment for a successful implementation of the strategy, including the integration of elements of this strategy in much wider existing strategies, plans and programmes such as the National Biodiversity Strategy and Action Plan, which is being updated, the National Adaptation Programme of Action (NAPA) on climate change as well as the National Adaptation Plan (NAP) being developed under the United Nations Framework Convention on Climate Change, and the national Sustainable Development Goals that the country will soon develop following the adoption of the 2030 Agenda for Sustainable Development by the world leaders in September 2015. In addition, building on ongoing activities including the training activities initiated within the PARCC project, the country will integrate the elements of strategic goals 1 and 2 above in its human, financial, institutional, legislative and technological capacity building programmes and in its communication, education, research and public awareness programmes. Considering the cross-cutting nature of climate change, coordination and cooperation within the country and in the region, especially across borders, will be strengthened. Synergies will be promoted among governmental groups/agencies dealing with PAs and climate change, and with relevant non-governmental organizations. The planning for the transboundary PAs linking the Gola Rainforest National Park (GRNP) of Sierra Leone and the proposed Gola National Park of Liberia and for the corridor between Sierra Leone's Outamba Kilimi National Park and Guinea's Madina Oula and Orekaba Forest Reserve will be accelerated, having in mind the strategic elements described above for the full integration of climate change considerations.

1. Introduction

Sierra Leone has a rich terrestrial and aquatic biodiversity. In recent years, the people of Sierra Leone have become increasingly aware of the inextricable relationship between, on the one hand, this natural capital and a healthy environment and, on the other hand, their survival, well-being, prosperity, economic development, spirituality, tradition and culture, and health and food security (EPASL, 2014). However, Sierra Leone's biodiversity is under a lot of pressure from deforestation, changing land-use patterns, habitat degradation and fragmentation, over-harvesting, poaching, pollution and contamination, and invasive alien species. It is increasingly recognized that climate change is exacerbating these pressures. Manifestation of the effects of climate change in the country includes rising sea level resulting in the loss of coastal habitat, sea water intrusion into estuarine and inland waters negatively impacting living organisms, erratic weather patterns and gradual fluctuation in hydrological patterns leading to reduced crop yield, pest and disease infestation and deteriorating soil quality. Climate change can compromise PA effectiveness not only by exacerbating other pressures on biodiversity and associated ecosystem services, but also by reducing the relevance of PAs when species they are supposed to protect have migrated in search of more favorable climatic conditions, or when PA segments become so degraded that they lose the functions for which they were created.

In this document, after a brief description of (i) the situation of the PA system in Sierra Leone and the plans for its management and development, and (ii) climate change impact and national plans to adapt to climatic perturbations, key outputs from the PARCC project are reviewed before describing the strategic goals, specific objectives, actions and actors for PA planning and management approaches taking into account climate change in Sierra Leone. The strategic elements and policy recommendations for the best approach to plan and manage PAs in the face of climate change were developed through a consultancy (see Annex 4 for the terms of reference, Annex 5 on the consultancy process and Annex 6 listing the people consulted/contacted). The final sections of the document are devoted to ways and means to implement the strategy.

Existing protected areas and their management plans

The first PAs were established a century ago with the declaration of the first forest reserve (Western Area Peninsula Forest Reserve) in 1916. As of March 2016, according to the Word Database on

Protected Areas (WDPA), Sierra Leone has 50 PAs occupying 19% of the national territory (11% of land area and 8% of marine area) (IUCN and UNEP-WCMC 2016). IUCN management categories have been reported for 5 national parks (category II), 1 habitat/species management area (category IV) and 1 protected landscape/seascape (category VI).

Information on management plans is not available either because they have not yet been developed, are currently being developed or are obsolete pending updating. This is for example the case for the management plan for GRNP, which was formulated for 2007-2012 and expired in 2012, or for the Loma Mountains National Park for which a Preliminary Management Plan was developed for 2013-2017.

The Environment Protection Agency of Sierra Leone (EPASL) was established in 2008 by an Act of Parliament to oversee, manage and protect Sierra Leone's environment. The National Protected Areas Authority (NPAA) and Conservation Trust Fund (CTF) Act was passed in 2012 to manage designated PAs and forest reserves in order to meet the objectives of the Convention on Biological Diversity (CBD). A number of terrestrial and marine environments have been declared under the NPAA Act. Despite this declaration, pressures on biodiversity have continued unabated, especially from anthropogenic factors. The status of wildlife in national parks and game sanctuaries has been recently reported to show that many forest bird and game animal populations have declined in numbers to the extent that some species have been decimated. However, without adequate data on the status and trends of species, populations and their ecosystems, it is nearly impossible to present an accurate picture on the subject.

Current plans to design and establish new protected areas

Sierra Leone has yet to publish its biodiversity targets in light of the Strategic Plan for Biodiversity 2011-2020. It is expected that some targets will translate the global biodiversity targets relating to protected areas, in particular Aichi Biodiversity Target 11 (17% terrestrial and inland water areas, and 10% marine areas, well connected and ecologically representative and managed effectively and equitably by 2020). However, as reported in its 5th National Report to the CBD, Sierra Leone hopes that a significant proportion of Aichi Biodiversity Target 11 will be achieved by 2020, considering the current progress made on conservation projects in GRNP, Loma, Western Area Peninsula Forest (WAPF) and Outamba-Kilimi National Park (OKNP). The Upper Guinea Forest Conservation Strategy published by Conservation International proposed a national park status for Loma Mountain Forest, and a marine protected area

status for the four estuarine systems of the Scarcies River: the Sierra Leone River, the Yawri Bay, the Turtle Island and the Sherbroe River. Birds and habitat conservation is well addressed within these frameworks.

Fifteen sites enlisted by the Forestry Division in the Ministry of Agriculture, Forestry and Food Security (MAFFS) were declared as of 1999 as having priority importance for transboundary (Sowa, 2012) conservation in the Upper Guinea forest eco-region, spanning across Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Ghana and Togo. Across the River, a transboundary peace park is being considered for the long-term protection of GRNP in Sierra Leone and the proposed Gola National Forest in Liberia. In the Northern Province of Sierra Leone, there is also a potential for the creation of another corridor between Sierra Leone's Outamba Kilimi National Park and Guinea's Madina Oula and Orekaba Forest Reserve (Ministry of Transport and Aviation, 2007)..

The expansion of the national PA system is one of the priority issues that were identified for the successful implementation of the CBD. But the expansion of PAs is constrained by two factors, namely the vast areas of land lease payments to land-owning communities covering a period of 5 decades and the apparent demand for farmland close to trunk roads to facilitate the sale of farm products especially firewood.

Current and projected impact of climate change on biodiversity in Sierra Leone

Previous studies on climate change show that rainfall and temperature are both changing in Sierra Leone (Masumbuko and Somda, 2014; and Conteh, 2014). According to simulation models, the average temperature for the period from 1961 to 1990 is likely to increase by around 7 to 9 percent by 2100 (Ministry of Transport and Aviation, 2007). These models also predicted a reduction in rainfall of around 3 and 10 percent for monthly and annual averages respectively. The upward trend in temperatures combined with the downward trend in precipitations suggested that Sierra Leone would experience recurring periods of drought in coming years and face a variety of climate hazards including strong winds, landslides, heat waves, flooding, heavy rainfall and a reduction in rainfall. In addition, rising sea level is depleting bird habitats along sections of the northern and southern coastlines of the Sierra Leone River Estuary (EPASL, 2014).

While there have been no reported targeted studies of the impact of climate change on PAs in Sierra Leone before the PARCC project (of which the results are presented in the next section), it has been noted that climate change was already threatening the flora and fauna of PAs (e.g. Karim and Okoni-Williams 2007). Faced with climate hazards, protected area ecosystems are slowly changing, and in some cases, degrading through the loss of habitats and wildlife. Water points in protected areas are drying up because of prolonged droughts and reduced rainfalls to the detriment of vegetation and wildlife and their ranges (Ministry of Transport and Aviation, 2007). Heat waves associated with violent winds are increasing the spread of bush fires, including in protected areas (Conteh, 2014). Climate hazards can also lead to a modification in animal migration periods, migration often being linked to the availability of food and water. In addition, rising sea levels will cause coastlines to recede and will thus affect protected areas in the coastal zone.

Climate change is also affecting communities living inside and at the periphery of PAs (Ministry of Transport and Aviation, 2007). Reports indicate that the agricultural sector is particularly vulnerable to climate change and variability. The sectors linked to agricultural production that are negatively affected are: land management, livestock farming and crop production. For their survival and livelihoods, local communities also exert harmful impacts on PAs through incursions to exploit the flora and fauna (poaching, illegal fishing and exploitation of timber and non-timber forest products) within PAs already impacted by industrial pollution, uncontrolled urbanisation, mining and tourism, pressures that will likely be exacerbated by climate change.

Forests are also liable to be negatively affected by climate change due to inappropriate policies. Indeed, there is a lack of policies to regulate and encourage sustainable forest management. In general, long years of socio-political crises have prevented Sierra Leone from acquiring reliable data and information on the relationships between livelihoods and the effects of climate change. Projections of climate change impacts across taxonomic groups in the region have predicted moderate to large range shifts for the majority of species, with many species also undergoing range contractions and declines in abundance (e.g. Barbet-Massin *et al.*, 2010 and La Sorte and Jetz, 2010).

National strategy for climate change mitigation and adaptation

Sierra Leone developed its National Adaptation Programme of Action (NAPA) in 2008. It contains its approach to 'climate smart conservation' which includes a list of priority climate change adaptation activities and a framework for capacity building for adapting to long-term climate change and variability. It also raises public awareness on the urgency to adapt to the adverse effects of extreme weather events (Ministry of Transport and Aviation, 2007). Specific adaptation activities include tree planting campaigns to restore virgin forests, improvement of agricultural irrigation systems, forestry management taking climate change issues into account, implementing income generating activities to improve local communities' living conditions, development of early-warning systems such as weather stations to predict climate risks, awareness-raising on natural resource protection, and the strengthening of human capacities for better management of natural resources and protected areas.

Building on experience gained since the First National Communication on climate change and during various studies from 1993 to date, the Government of Sierra Leone in partnership with UNDP is developing its Second National Communication (SNC) on climate change to, among other objectives, undertake programs containing measures to facilitate adequate adaptation and mitigation of climate change, to strengthen relevant national capacities, to further raise general knowledge and awareness on climate change and its effects, and to increase involvement of all relevant stakeholders. Development of the SNC provides an opportunity to highlight the importance of PAs as elements for climate change adaptation and mitigation measures, and to develop and manage a national PA system resilient to climate change.

Along these lines, a project entitled "Conservation in the face of Climate Change: Developing an Adaptive Management Framework (AMF) for the conservation of birds and other biodiversity across Africa" is being implemented since 2007. The objectives of the project include (i) the development of a national PA system for high-biodiversity sites across Sierra Leone using the Important Bird Area network, (ii) refining and progressing implementation of the Gola Rainforest National Park management as a model case-study region, and (iii) developing a country-wide knowledge-exchange facility for climate change and biodiversity information and research. The budget for adaptation actions targeting PAs in the NAPA is relatively important, estimated at 23.7% of the provisional NAPA budget (Ministry of Transport and Aviation, 2007). With respect to the need to continue generating and compiling more information on climate change and its impacts, Sierra Leone has also established a Climate Change Secretariat.

2. Overview of PARCC Project Findings of Relevance to Sierra Leone

Changes in temperature and precipitation as well as sea level rise may make some PAs unsuitable for the species that they currently protect. Mitigating the impact of climate change on PA networks is thus becoming a priority. Among the first steps adopted for mitigating the impact of climate change, one can note the identification of species and PAs that are likely to be impacted by climate change, either through distribution modeling or trait-based analyses. This should be followed by recommendation of management actions, such as establishing new PAs, translocating vulnerable populations or managing existing PAs to increase the population viability of target species.

In this context, the PARCC project achieved a number of goals for the West African region including (i) collating climate data and producing future regional climate scenarios; (ii) modelling future distribution ranges of bird, mammal, and amphibian species, (iii) updating the IUCN Red List of Threatened Species and assessing species' vulnerability to climate change based on their biological traits, (iv) identifying areas resilient to climate change, and (v) bringing the results together for systematic conservation planning to identify priority areas for conservation and assess the suitability of the existing PA network.

Projections of climate change

The PARCC project produced climate projections for the West Africa region, by applying five spatially detailed regional climate models developed for the project (Jones et al. 2012) and three scenarios of future land use change to assess the projected climate impacts on ecosystem services (Hartley et al. 2015a). These climate studies were summarized for each project countries including Sierra Leone (Hartley et al. 2015b).

In Sierra Leone, the results of the climate projections confirm the findings of previous studies (presented in the previous section). It is projected with high confidence that mean annual temperatures will increase (by an estimated 2.5–4°C according to regional climate projections) by the end of the 21st century (Janes et al. 2015). The highest temperature increases are expected to occur furthest inland, which is less influenced by the regulating influence of the ocean. There is low confidence in projections of

an increase in wet season total precipitation (+7 to +20% according to regional climate projections), with more important precipitation increases expected in coastal areas.

In terms of climate change impacts on ecosystem services, it is projected with high confidence that the fraction of broadleaf tree cover and vegetation productivity will increase throughout Sierra Leone as a result of temperature increases, which is expected to lead to an increase in vegetation carbon storage. However, scenarios of future land use show that human disturbance would significantly reduce this increase (Hartley *et al.* 2015a).

Other observations made within the framework of the project (Sowa, 2012) indicate that climate change is already having noticeable impacts on habitats and plant and animal species in Sierra Leone. It is likely that with the current trend of unsustainable use of the country's biodiversity, future changes will affect the distribution of species and result in losses of biodiversity. Individual species will respond differently according to their climate tolerances and their ability to disperse into a new location. It is difficult to predict how communities will change or how current interactions between species will be affected. Furthermore, marine ecosystems will be affected not only by an increase in sea temperature and changes in ocean circulation, but also by ocean acidification, which increases the vulnerability of fragile marine ecosystems.

Species Distribution Models

The static and fixed-boundary nature of current PAs compromises their effectiveness in the face of species range shifts caused by changing climatic conditions. The PARCC project used models that link species' distributions to biologically important climatic variables that are likely to define species' distributions in order to project faunal (birds, mammals and amphibians) distributions and representation across PA networks in West Africa. The project found that by the end of the 21st century, 91% of amphibian, 40% of bird, and 50% of mammal species are projected to have reduced climate suitability across the West African PA network, and that individual PAs were likely to both lose and gain species as a result of species distribution shifts (Baker and Willis 2015), with species turnover within PAs expected to reach 45.7% for amphibians, 32.4% for birds and 34.9% for mammals by the end of the century.

In Sierra Leone, mammal species richness is projected to change relatively little in tropical forests rich in species, compared to other West African countries (Durham University 2016). Regarding expected changes in bird species richness by the 2040-2069 time period, four bands of impact have been identified, running roughly north-west to south-east across the country, in parallel bands inland from the coast. Little changes in species richness are expected in coastal protected areas, whereas greater changes are expected in the north east of the county, which is expected to show an increase in bird species richness. Finally, projected changes in amphibian diversity are variable across the country, but expected to be overall rather small.

Climate Change Vulnerability Assessment Based on Biological Traits

A climate change vulnerability assessment of West African species was carried out, which considered the combination of exposure (extent to which a species' physical environment will change due to climate change), sensitivity (lack of potential for a species to persist *in-situ*) and low adaptability (species' inability to avoid the negative impacts of climate change through dispersal and/or micro-evolutionary change). The assessment included all the terrestrial and freshwater vertebrates of West Africa (183 amphibians, 1,172 birds, 517 freshwater fish, 405 mammals and 307 reptiles). Species that were found both sensitive and poorly able to adapt to climate change, and that were among the most severely exposed to climatic changes were described as 'climate change vulnerable' (Carr et al. 2015). This methodology does not provide a definitive indication of vulnerability, but a relative measure that may be compared between species within a group. The results of this study should help prioritize among species and locations to ensure the most efficient and effective use of resources when securing species survival in the face of climate change.

The project recommended that when planning for future conservation and determining geographic priorities, planners should focus more on locations that contain comparatively high numbers of climate change vulnerable and/or threatened species. This strategy could have the greatest positive impact per unit effort, and should address the conservation of the greatest number of species. However, areas with relatively low species richness and low numbers of vulnerable species should not be neglected.

Regarding Sierra Leone, the assessment showed that the country was particularly rich in species, including threatened species (Carr et al. 2014), especially amphibians, birds, freshwater fish and

threatened mammals. The Guinean Forest region, which ranges from Sierra Leone in the west, to southern Nigeria in the east, indeed presents a very high species richness and supports several threatened species from most taxonomic groups. In particular, the coastal and forest regions of Sierra Leone, Liberia, Cote d'Ivoire and Nigeria contain the highest proportions of bird species identified as climate change vulnerable by the 2040-2069 time period. Finally, it was suggested that one area where transboundary conservation efforts could be particularly valuable is along the borders of Guinea, Sierra Leone, Liberia and Cote d'Ivoire.

Areas Resilient to Climate Change

In a preliminary study, the PARCC project identified areas in West Africa where climate change impacts might be relatively low due to particular physical factors influencing climate at the fine-scale, including precipitation patterns.

In Sierra Leone, the project found that 19.7 % of the territory could be naturally resilient to climate change and that 13.9 % of this area is already included in PAs (Smith 2013b). The identification of these areas of resilience was based on the fact that physical factors of some areas (e.g., slopes facing away from the Equator and important elevation gradients) can provide considerably lower mean temperatures and lower precipitations. For instance, land on steep slopes allows species to disperse to higher ground in response to climate change. Therefore, these areas could act as small refugia, which could be colonized by species from neighboring areas if temperatures increase.

Systematic Conservation Planning

Systematic conservation planning is the most widely used approach for designing PA networks. Based on a list of important conservation features (such as species, habitats and ecological processes), their distributions was mapped and targets were set for how much of each conservation feature should be protected. A gap analysis was then carried out to measure the extent to which the existing PA system met these targets, and priority areas for conservation were identified.

In Sierra Leone, 5.8 % of the territory is included in PAs and 0.7% is included in currently unprotected Important Bird and Biodiversity Areas (IBAs), according to the data included in the World

Database on Protected Areas (IUCN and UNEP-WCMC 2015). The conservation features considered included all ecoregions and vegetation types, elevation zones, the present distribution of all amphibian, bird and mammal species found in Sierra Leone, and the future projected distribution of threatened species. The gap analysis showed that the existing national PA system meets targets for only 11.7% of conservation features. It is indeed failing to meet targets for almost all species considered, especially amphibians. Most of the priority areas for protection were identified around existing PAs and in the central and western parts of the country. Therefore, given the important gaps identified, it is recommended that Sierra Leone expands its national PA system, which would need to cover 19.7% of the territory in order to achieve all conservation targets.

Other relevant results and achievements of the PARCC project

(a) Connectivity analysis of the West African PA network: This study presents an approach to ensure and improve connectivity between PAs for species with different habitat preferences (forest and grassland specialists, and generalists) and dispersal abilities (short, medium and long). This approach highlighted the importance of specific PAs to maintain the connectivity of the regional network, such as GRNP (Arnell *et al.*, 2014).

(b) Transboundary pilot site activities to enhance protected area resilience: The PARCC project selected, in agreement with countries' representatives, five pilot transboundary sites where activities were conducted to enhance PA resilience to climate change. These sites included GRNP in Sierra Leone, with Gola National Park in Liberia.

(c) Protected area management and financing options for climate change adaptation and monitoring: The PARCC project reviewed a range of options for managing PAs so as to ensure their adaptation to climate change. Several adaptation measures were identified, some of which are currently used in West Africa. It was also noted that there are several financing mechanisms for PAs, among which only a small number is used in West Africa (Smith 2013a);

(d) Updated Management Effectiveness Tracking Tool (METT): Existing tools for PAs management effectiveness assessment focus mainly on sites without considering the effects of climate change. The PARCC project integrated climate change factors in the original PA Management Effectiveness

(PAME) approaches developed by the IUCN World Commission on Protected Areas, and incorporated two new indicators related to climate change to the existing METT (Belle *et al.*, 2012);

(e) National and regional capacity building for managing protected areas in the face of climate change: The PARCC project organized several training workshops to enhance the participants' knowledge and skills in the field of PAs and climate change in West Africa and more specifically in the five project countries (UNEP-WCMC, 2015).

3. Elements for a Strategy for the Best Approaches to Plan and Manage Protected Areas in the Face of Climate Change

Vision

The vision of a national strategy for the best approaches to plan and manage protected areas in the face of climate change in Sierra Leone can be the same as the vision for the National Biological Diversity Strategy and Action Plan 2003, which “seeks conservation measures that provide a solid framework for the sustainable exploitation of Sierra Leone’s biological diversity for the benefit of present and future generations,” bearing in mind that biodiversity and its ecosystem services are essential for the well-being and for sustainable development of the people of Sierra Leone.

Mission

The aim of the strategy is to strengthen ongoing reactive and anticipative activities for the conservation of components of biodiversity and associated ecosystem services that require protection and sustainable use. These components are particularly important for the sustainable development of Sierra Leone. However, some of these components are threatened by various natural and anthropogenic pressures, including climate change.

Strategic Goal 1: Strengthen ongoing conservation plans and programmes and their implementation by improving the performance of existing protected areas (PAs) and by finalising the designation or regulation of areas identified as requiring protection.

Objective 1.1: Assess existing PAs and ensure their sustainable and effective management so as to improve the achievement of the conservation objectives for which they were created

As noted in section 1 above, Sierra Leone’s biodiversity is under a lot of pressures. The country took several measures to reduce the loss of biodiversity including, as cited in the 5th National Report, the adoption of the National Protected Areas Act (NPAA) in 2012; the classification of 19% of the national territory as protected areas; the formation of a Protected Area Task Force; the establishment of the Bumbuna Watershed Management Authority (BWMA); co-management in fishing communities and

formation of community management authorities and of the Environment Protection Agency Sierra Leone (EPASL), which is taking the lead in biodiversity mapping, education and sensitization.

The NPAA and the CTF were established specifically to promote biodiversity conservation, wildlife management and research, and to provide for the sale of ecosystems services in the national protected areas. The NPAA also exercises oversight authority over national parks and PAs designated for conservation purposes, so as to protect the fauna and flora in their natural state, and promote sustainable land use practices and environmental management.

Only a few PAs have been reported to have management plans (e.g. Gola Forest Reserve Management Plan 2007-2012) that are obsolete and require updating. For many other protected areas, management plans are yet to be developed. Management plans will guide the implementation of the objectives outlined in the decrees of the respective PA creation. The development or updating of management plans will have to address all the various pressures impacting PA biodiversity and associated ecosystem services, including climate change,

Objective 1.2: Accelerate and complete the designation and integration of areas identified as requiring protection in the national PA system

There are several areas in Sierra Leone that could be classified as protected for their value and/or because their status or that of one of their components is declining or has declined significantly. This is the case for example for the following IBAs: Lake Sonfon and around, and Yawri Bay. Their rapid classification/designation as PAs is justified given the existing pressures and threats from many drivers, including climate change. It is important to designate and include these areas in the national PA system to enhance their resilience to climate change.

Objective 1.3: Identify biodiversity components and related ecosystem services important for Sierra Leone and adopt measures for their protection as needed, bearing in mind the Sustainable Development Goals and the new perspectives in the conservation of biological diversity, adaptation to climate change and land degradation issues

The identification of biodiversity components requiring conservation is a process that needs to be regularly updated to take into account the needs for sustainable development on the one hand, and the status and trends of biodiversity impacted by changing pressures on the other hand. It is thus necessary

to check and update the list of conservation features used in systematic conservation planning processes as needed, and assess whether the PA system continues to be representative of all the components of biodiversity requiring protection, in order to ensure their availability for the sustainable development of Sierra Leone and its population's well-being today and in the future.

Objective 1.4: Conduct a gap analysis using an updated list of conservation features, i.e., components of biodiversity that should be protected, and prioritize them bearing in mind the threats posed to them and their ecological/biological and socioeconomic importance in the country.

The PARCC project provided training at multiple institutional levels to carry out systematic conservation planning and identify priority areas for conservation. The experts trained should use the methodology and knowledge to verify on the ground and fine-tune the results on the gap analysis (including using an updated list of conservation features from Objective 1.3 above).

Actions and potential actors for implementing these objectives are listed in Table 1 below.

Strategic Goal 2: Anticipate and respond to ongoing and future environmental changes, focusing on changes caused by climate change.

Objective 2.1: Increase knowledge on observed and projected impacts of climate change on biodiversity and associated ecosystem services in Sierra Leone

The 5th IPCC Report presents an overview of the observed and projected impacts of climate change (temperature, precipitation and sea level rise) on biodiversity in Africa with concrete references to West Africa. Additional data for Sierra Leone have been reported in technical reports of the PARCC project (Jane et al. 2015, Hartley et al. 2015). These data need to be continuously refined with more observations, particularly at the land or seascape and site levels, and within PAs. For this purpose, there is a need to engage and support institutions dealing with climate, biodiversity, climate change adaptation and mitigation, including meteorological stations and research institutions, and encourage collaboration among them. Collaboration with local communities will also be necessary for gathering relevant local and traditional knowledge, in accordance with Article 8 (j) of the CBD and national legislation.

Objective 2.2: Identify and appropriately manage climate refugia, areas that are resilient to climate change and areas that will include the future geographical distribution of species displaced by climate change

In the face of climate change, decision makers will need to investigate and anticipate where species could potentially move to and start protecting some of those areas in advance, such that those areas (including climate refugia) not destroyed or lost before the species move there.

The PARCC project has been able to document (i) the list of mammal, bird, reptile, amphibian, and freshwater fish species considered vulnerable to climate change based on their biological traits, (ii) species expected to lose or gain in climate suitability for each protected area, and the expected species turnover for mammals, birds and amphibians, and (iii) the presence of areas that could be naturally resilient to climate change. This data can be used to develop plans and programmes that anticipate some of the expected impacts of climate change in the country, as a complement to the strengthening of ongoing measures related to the establishment and effective management of PAs.

Possible anticipative measures include conducting a gap analysis to identify whether existing PAs are suitable to protect future distribution of species, and if necessary, the design and establishment of relatively large protected areas that would include areas of present and future distribution of species. These large PAs will thereby foster the ability of species to move across protected landscapes to ensure their persistence in the face of climate change, as well as that of the ecosystem services provided. The establishment of large PAs can be done only after consideration of other land-use and development plans, and in consultation and agreement with local communities and other groups of stakeholders. Specific measures can be taken to protect species that would otherwise become more vulnerable with the increased impact of climate change, for example by facilitating their migration or translocation into climate refugia.

Objective 2.3: Bearing in mind possible shifts in species ranges, develop, re-evaluate, restore and/or maintain ecological corridors and stepping stones between protected areas, taking into account climate change impacts

Fragmentation and degradation of PAs may make individual PAs unsuitable for species protection and/or delivery of ecosystem services, while climate change is likely to cause shifts in species distributions.

Corridors linking individual PAs can help alleviate this issue. For instance, corridors between the twin parks of Outamba and Kilimi could greatly enhance the ecological viability of the two parks.

There is indeed a potential for the creation of (i) a corridor between Sierra Leone's Outamba Kilimi National Park and Guinea's Madina Oula and Orekaba Forest Reserve; and (ii) a permanent natural corridor between the Gola Rainforest National Park, Tiwai and the Kambui South Forest Reserve in order to maintain Tiwai as an important natural area and harmonize its management with that of the GRNP (Sowa, 2012). In line with their functions, the NPAA and CTF could develop and promote national protected area corridors building on the PARCC project findings (Arnell et al. 2014), after their validation on the ground in consultation and agreement with local communities and development sectors active in the region.

Strategic Goal 3: Strengthen the enabling environment for the successful implementation of the strategy

The success of a strategy depends largely on the factors that promote its implementation. These factors include mainly the integration of the strategy into strategies, objectives, plans or programs which are at the top level in the country's politics, such as the objectives for sustainable development, poverty reduction strategies, the National Biodiversity Strategy and Action Plan (NBSAP), and the National Adaptation Programme of Action (NAPA) on climate change and the climate change National Adaptation Plan (NAP). Other factors include available capacities (human, financial, technological and institutional), awareness and engagement of stakeholders, availability and access to relevant data and information, and existence of monitoring mechanisms.

Strategic goals 1 and 2 and the associated actions listed in Table 1 below present the objectives that would ensure the best approaches to the planning and management of PAs in the face of climate change in Sierra Leone, both at the research, technical, planning and management levels, and at the landscape, PA site and policy levels. Strategic goal 3 focuses on strengthening Sierra Leone capacity to ensure the successful implementation of actions under this strategy.

Unavailability of sufficient financial resources, limited human, technological and institutional capacities, and weak enforcement of laws relating to conservation of biodiversity in Sierra Leone have been highlighted as constraints to the achievement of Sustainable Development Goals in various policy

documents, including the national biodiversity strategy and action plan, the national Millennium Development Goals (MDG) and the Poverty Reduction Strategy Paper (PRSP). Resource mobilization is considered as one of the key priorities. Participatory action with associated monitoring mechanisms, access to information, awareness about the biodiversity and its drivers, and equitable sharing of benefits and costs of measures taken will generate commitment, particularly of local communities; and capacity development supported by research will enhance stakeholder participation.

Objective 3.1: Integrate this strategy on protected areas and climate change in broader national strategies and plans

Integration of this strategy into much wider national strategies, goals, plans and programmes that have been established as priorities and/or that already benefit from the resources approved by the government is essential if the strategy is to be successfully implemented. This integration is in line with one of the principles of the NCSA Capacity Action Plan (CAP) stating that CAP should be firmly mainstreamed into the broader context of sustainable development and closely related to goals such as poverty alleviation and achieving the Millennium Development Goals (MDGs).

The National Adaptation Planning (NAP) process and the updating of the NBSAPs are under way in Sierra Leone. The two processes provide an opportunity for integrating elements identified in this strategy on protected areas and climate change. While the NAPA developed in 2007 identified a number of short-term projects to respond to the needs of Sierra Leone to adapt to climate change, the NAP process is under way to facilitate the identification and implementation of longer term adaptation needs and development.

Objective 3.2: Strengthen human, financial, institutional, legislative and technological capacities

The NCSA identified priority capacity needs and proposed a Capacity Action Plan to address the needs to fill the capacity gaps at all levels of the society (GOSL, 2006), including local communities, the private sector and government institutions, and leverage both human and financial resources. Capacity building needs identified in this strategy will build on ongoing capacity building activities to improve effectiveness and efficiency in its implementation. According to Vision 2025, capacity building and

capability enhancing programmes are needed, given the low levels of technical capability in the country and the fact that many well-trained and qualified Sierra Leoneans have emigrated to other countries.

As stated in the 5th National Report, plans and mechanisms are in place to address capacity building in the country (e.g. 2014 Sierra Leone Biodiversity Conservation Project, and 2015 Sierra Leone Wetlands Conservation Project). There are structures in the country on which to build programmes for strengthening capacities, education curricula, research and awareness raising of climate change impact and adaptation to climate change, including activities initiated through the 2006 National Capacity Needs Self-Assessment Report and Action Plan; in the framework of the NAPA, the 2012 Second National Communication on Climate Change; and the training activities carried out within the framework of the PARCC project with the objective of establishing a critical mass of experts.

The implementation of this strategy requires mobilization and timely availability of funds, as does the implementation of the plan of action for PA and NAPA initiatives relating to PAs. Funding can be explored from the government (including the Conservation Trust Fund) and NGOs, in addition to the Global Environment Facility (GEF), the Fund for Least Developed Countries (FLDC), the Special Climate Change Fund and the Adaptation Fund under the Kyoto Protocol (also see Smith, 2013a). Bilateral processes and other mechanisms such as REDD+ are also worth exploring. The national REDD+ programme became operational in 2013. The private sector involvement in biodiversity management (e.g., the Tacugama Chimpanzee Rehabilitation project, which cooperated with the Sierra Leone National Airlines from 2004 to 2006) can also generate funds for biodiversity conservation.

In accordance with the ecosystem approach, long-term implementation of this strategy requires stable institutions, legal and policy frameworks, monitoring programs, and extension and awareness programs supported by communication strategies and training programs. Effective rebuilding and management of PAs requires provision, construction and upgrading of physical assets, the empowerment of grass root administrative structures to enact by-laws for the management, use and protection of biological resources and biodiversity, as well as the management of databases on biodiversity and biological resources. The approach adopted in Vision 2025 requires redesigning the planning processes and undertaking institutional reforms, in addition to putting in place appropriate follow-up and monitoring mechanisms. Accordingly, the Vision recommended the setting up of two new outfits, the National Vision Council (NVC) and the Strategic Planning and Information Unit (SPIU). Laws of relevance

to this strategy, in particular the 2012 National Protected Area Authority and Conservation Trust Fund Act, need to be enforced. Finally, technologies to implement several of the actions identified in this strategy are not yet available or widespread in Sierra Leone.

Objective 3.3: Strengthen communication, education, research and awareness on the issues of protected areas, the impact of climate change and adaptation to climate change

Communication, education, research and awareness-raising on the issues relating to PAs, the impacts of climate change and adaptation to climate change are essential for the success of this strategy. These activities will support the decision and policy making process, and invite and strengthen participation (including of the media, parliamentarians and local communities). The role of the NAPA contributing to this is recognized in Part III of the NPAA/CTF Act. As noted in the 5th National Report to the Convention on Biological Diversity (EPASL, 2014), NGOs and civil societies support government institutions in raising awareness on environmental and conservation issues, particularly around protected forests and in the face of climate change.

Several relevant initiatives are under way in the framework of the implementation of the NAPA and/or the 2003 NBSAP and could be reinforced by further integrating PAs and climate change issues. Existing and new data and information of relevance to climate change and its impact, and to PAs and biodiversity conservation need to be collated and organized into user-friendly and accessible databases.

Objective 3.4: Strengthen coordination and cooperation including transboundary cooperation

The planning, establishment and management of PAs, and the development and implementation of measures to address climate change at the species, site, waterscape and national levels require the participation of various people and institutions. There is a need to foster cooperation among the stakeholders and have their work well coordinated to ensure coherence, synergies and efficient use of resources. Various bodies, such as the NPAA overseeing PAs, were established to ensure coordination of activities, and infrastructures are designed to protect the fauna and flora in its natural environment, promote sustainable land use practices and environmental management in the face of various pressures, including climate change.

Past policies (e.g., the 1972 Wildlife Conservation Act and the 1988 Forestry Act) removed community participation from forest management, but the 2010 Forest Policy rectified that. Although Tiwai Island Wildlife Sanctuary is the only community conservation programme in Sierra Leone, the effectiveness of the contribution of local communities to biodiversity management has been recognized, especially where the management of PAs has been ineffective due to lack of resources. In this perspective, a community-driven forest management programme is being put in place in the Kambui Hills North Forest Reserve in order to revitalize the management of the reserve by empowering forest edge communities to participate in decision-making processes (Sowa, 2012) and agree on ways to reduce the impacts of local communities within and around PAs. Current cooperation with local communities (through co-management) and among ministerial departments, as well as partnerships involving NGOs (Sowa, 2012), have proven very beneficial to natural resource management and conservation in Sierra Leone. This type of cooperation should be fostered in the implementation of this strategy.

Cooperation should also be promoted and strengthened with neighbouring countries for transboundary PAs, bearing in mind possible shifts in species ranges due to climate change and the need for corridors to link isolated PAs and facilitate migration of species displaced by climate change. The possible creation of transboundary PAs and corridors in Sierra Leone has been reported, e.g. for the threatened forests in the Upper Guinea forest ecoregion crossing Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Ghana and Togo; for the Gola Rainforest National Park of Sierra Leone and the proposed Gola National Forest of Liberia; and the corridor between Sierra Leone's Outamba Kilimi National Park and Guinea's Madina Oula and Orekaba Forest Reserve. There are many experiences of transboundary cooperation in West Africa, including the STEWARD project (<http://stewardprogram.org/where-we-work/priority-zone-1/>) that can serve as a guide in ways and means to set up and successfully manage transboundary PAs. Additional experiences were gained through the PARCC project that implemented activities at five transboundary pilot sites, including the transboundary PA consisting of the Gola Rainforest National Park in Sierra Leone and the Gola National Park in Liberia.

Table 1: Key actions, potential specific activities, coordination and anticipated participation of ministries and other contributors

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
Strategic Goal 1: Strengthen ongoing conservation plans and programs and their implementation by improving the performance of existing protected areas (PAs) and by finalising the designation or regulation of areas identified as requiring protection.		
<i>Objective 1.1: Assess existing PAs and ensure their sustainable and effective management so as to improve the achievement of the conservation objectives for which they were created.</i>		
(a) Periodically and systematically evaluate the effectiveness of the management of existing PAs based on the objectives outlined in the decrees of their creation and in their management plans, if available.	<p>Various tools, such as the Management Effectiveness Tracking Tool (METT), are available for assessing PA management effectiveness. The PARCC project added new questions to the METT to address the planning and management response to climate change at the PA scale.</p> <p>This evaluation will also have to include an examination of the possible changes in the presence, richness and distribution of species and communities, in the functional attributes of habitats, ecosystems and landscapes, and whether some areas need to be modified or adapted in order to meet the challenges of climate change. This evaluation could be undertaken using, among other techniques, satellite imagery to evaluate for example the changes in land use, primary productivity and phenology.</p>	<p>Most of the actions under this objective are part of the functions of the National PA Authority (see The National Protected Area Authority and Conservation Trust Fund Act, 2012) including e.g., (i) management, monitoring and evaluation of PAs; (ii) development and approval of management plans, zoning and National Protected Area regulations; and (iii) overseeing of the management of local and private nature reserves and sanctuaries.</p> <p>Also:</p> <p>Ministry of Agriculture, Forestry and Food Security (MAFFS), Ministry of Internal Affairs, Local Government and Rural Development (MIALGRD)</p>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
<p>(b) Update management plans and develop new ones for PAs lacking them, making sure they integrate climate change aspect and using a participatory approach.</p>	<p>Management plans have been referred to for a few PAs in Sierra Leone (e.g. Gola Forest Reserve Management Plan 2007-2012). However, they all seem to be obsolete and require updating. For GRNP, the updating of the management plan is aligned with REDD⁺ for carbon revenues.</p> <p>The development of management plans should specifically integrate climate change considerations that have or have not been taken into consideration in the past, including plans to anticipate the future impacts of climate change. .</p> <p>Pressures on protected areas need to be addressed including the following threats identified in the NAPA: forest fires, incursion in PAs due to absence of buffer zones and clear PAs demarcation.</p>	<p>Ministry of Lands, Country Planning and Environment (MLCPE)</p> <p>Ministry of Fisheries and Marine Resources (MFMR)</p> <p>the Sierra Leone Environmental Protection Agency (SLEPA)</p> <p>Local and international NGOs</p> <p>Representative of communities</p> <p>Conservation Society of Sierra Leone (CSSL)</p> <p>Njala University (NU)</p>
<p>(c) Revise the status and governance of protected areas that are not managed effectively and consider whether they can be re-classified including as community-managed PAs</p>	<p>Past policies (e.g., the 1972 Wildlife Conservation Act and the 1988 Forestry Act) removed community participation from forest management, but the 2010 Forest Policy changed that. Although Tiwai Island Wildlife Sanctuary is the only community conservation programme in Sierra Leone, the effectiveness of the contribution of local communities to biodiversity management has been recognized, especially</p>	<p>National Protected Area Authority and Department of Community Conservation, Outreach and Co-management</p> <p>Research organizations and specialized NGOs</p>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
	<p>where management of PA has been ineffective due to lack of resources. In this perspective, a community-driven (co-management) forest management programme is being put in place in the Kambui Hills North Forest Reserve in order to revitalize the management of the reserve by empowering forest edge communities who can participate in decision-making processes (Sowa, 2012) and agree on ways to reduce the impacts of local and other communities within and in the periphery of PAs.</p>	
<p>(d) Strengthen activities aimed at reintroducing extinct or threatened species in PAs, and promote their recovery by applying the appropriate management plans in line with Aichi Biodiversity Target 12, the corresponding national target¹ and Article 8 of the Convention on Biological Diversity</p>	<p>The PARCC project provides a list of threatened species in Sierra Leone. The status and trends of biodiversity need to be assessed regularly and plans to recover threatened species and re-introduce extinct species will help prevent future extinctions due to climate change</p>	
<p>(e) Identify the direct and indirect factors that determine the effectiveness of the management of existing PAs, and implement the appropriate measures, preventive or corrective, to improve and maintain management effectiveness at an adequate level</p>	<p>This entails:</p> <ul style="list-style-type: none"> (i) Identifying and assessing both direct and indirect threats/pressures and reducing their impacts on PAs and on measures taken to implement management plans; (ii) Applying adaptive management with monitoring programs to improve and/or 	<p>National PA Authority, Ministry of Agriculture, Forestry and Food security (MAFFS), Ministry of Fisheries and Marine Resources (MFMR), Environment Protection Agency, Sierra Leone (EPASL)</p> <p>Companies like ADDAX (bioenergy company that owns sugar</p>

¹ Under development as of March 2015

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
	<p>maintain adequate levels of resilience in PAs and assess the implementation of management plans;</p> <p>(iii) Undertaking or supporting the restoration of degraded PAs and buffer zones around protected areas, including the reintroduction of extinct or threatened species. It will be useful, in the planning and execution of this work, to integrate services associated with biodiversity conservation (for example, carbon sequestration and storage to reduce greenhouse gas), the conservation of knowledge and of other cultural resources and considerations related to climate change. Vegetation restoration, especially reforestation programs are vital to the enhancement of ecological services to local communities and the country as a whole;</p> <p>(iv) Building on existing structures, legislation and ongoing initiatives, to develop and implement programs for the sustainable use of natural resources for local communities around protected areas, in order to reduce pressures on resources</p>	<p>plantations) and West Africa Agriculture, helping in biodiversity restoration</p>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
	within protected areas, in accordance with Article 8 of the CBD.	
Objective 1.2: Accelerate and complete the designation and integration of areas identified as requiring protection in the national PA system		
Establish the list of all areas identified as requiring protection and accelerate the process that will lead to their integration in the national PA system.	<p>This requires: (i) the identification of key conservation features; and (ii) mobilisation of the necessary resources for the creation and appropriate management of the new protected areas when they are established. These activities should be done with the full participation of local communities and other stakeholders such as the private sector. It is important to make sure that the new PAs contribute effectively to achieving the country's objectives related to the conservation and sustainable use of biodiversity and ecosystems services, as well as Aichi Biodiversity Target 11 and MDG 7.</p> <p>The "Establishment of new Forest Reserves, Protected Areas and National Parks" and "Management and Protection of Forest Reserves and Catchment areas including Wetlands" are among the urgent and immediate adaptation needs or strategies suggested in the NAPA of Sierra Leone.</p> <p>Areas identified as requiring protection and that could be candidates for a rapid classification and</p>	<p>Most of the actions under this objective are part of the functions of the National PA Authority (see The National Protected Area Authority and Conservation Trust Fund Act, 2012)</p> <p>Also:</p> <p>Ministry of Agriculture, Forestry and Food Security (MAFFS)</p> <p>Ministry of Internal Affairs, Local Government and Rural Development (MIALGRD)</p> <p>Ministry of Lands, Country Planning and Environment (MLCPE)</p> <p>Ministry of Fisheries and Marine Resources (MFMR)</p> <p>Ministry of Tourism and Cultural Affairs (MTCA)</p> <p>the Sierra Leone Environmental Protection Agency (SLEPA)</p> <p>Local and international NGOs</p> <p>Representative of communities</p>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
	<p>regulation as PAs include unprotected Important Bird and Biodiversity Areas (IBAs) (e.g. unprotected Lake Sonfon and environs), as well as marine and coastal areas such as Yawri Bay, Sherbro River Estuary, Sierra Leone River Estuary and Scarcies River. Although marine areas could not be considered in the PARCC project, it is important to note that among the priorities identified in its 5th National Report to the CBD, Sierra Leone is aware of the fragility of its marine and coastal areas and plans to designate and effectively manage ecologically and biologically important marine and coastal areas as marine parks, and also as part of its commitment to RAMPPO (West African Network of Marine Protected Areas).</p>	<p>Conservation Society of Sierra Leone (CSSL) Njala University (NU)</p>
<p><i>Objective 1.3: Identify biodiversity components and related ecosystem services important for Sierra Leone and adopt measures for their protection as needed, bearing in mind the Sustainable Development Goals and the new perspectives in the conservation of biological diversity, adaptation to climate change and addressing land degradation issues.</i></p>		
<p>(a) Identify, inventory, map and monitor species, habitats, ecosystems and related ecosystem services that are important for the country's sustainable development (i.e. important ecologically, socially and economically) and poverty eradication.</p>	<p>These activities should focus on those biodiversity components that are vulnerable to climate change and in general at risk, or that ensure the resilience of human communities and biodiversity/ecosystems to climate change now and in the future.</p>	<p>Ministry of Agriculture, Forestry and Food Security (MAFFS) Ministry of Internal Affairs, Local Government and Rural Development (MIALGRD)</p>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
	<p>Their implementation should build on ongoing activities and the results of the PARCC project, and include the following:</p> <ul style="list-style-type: none"> (i) Regularly assess the status of the various components of biodiversity and their values. The elements of biodiversity that are both unique in the country, threatened (especially if the threat is global) and vulnerable to climate change should be considered a priority in the planning and conservation programs; (ii) Use and disseminate data on vulnerability of species from the PARCC project. According to the PARCC study on species vulnerability, Sierra Leone is among West African countries hosting the greatest numbers of vulnerable species; (iii) Produce or revise maps of: <ul style="list-style-type: none"> (a) Sites that contain a comparatively high number of species that are threatened and/or identified as vulnerable to climate change, especially in areas with limited resources such as freshwater; (b) Sites that have international recognition such as Ramsar sites and Important Bird and 	<p>Ministry of Lands, Country Planning and Environment (MLCPE)</p> <p>Ministry of Fisheries and Marine Resources (MFMR)</p> <p>Ministry of Mineral Resources (MMR)</p> <p>Ministry of Tourism and Cultural Affairs (MTCA)</p> <p>the Sierra Leone Environmental Protection Agency (SLEPA)</p> <p>Local and international NGOs</p> <p>Representative of communities</p> <p>Conservation Society of Sierra Leone (CSSL)</p> <p>Njala University (NU)</p> <p>Fourah Bay College (FBC)</p> <p>Civil society</p> <p>Private sector</p>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
	<p>Biodiversity Areas, but that have no official status of protection;</p> <p>(c) Other important components of biodiversity, including their ecological/environmental and socio-economic value, i.e., the ecosystem services they provide.</p> <p>This study should also include what happens when components of biodiversity are lost or degraded and thus can lead to a loss of ecosystem resilience to environmental change;</p> <p>(iv) Identify priority species and areas to be protected for the survival of species and maintenance of ecosystem services in the face of climate change;</p> <p>(v) Gather the necessary data for use as baselines;</p> <p>(vi) Assess, monitor and predict the impact of climate change on the status, functioning and trends of biodiversity elements particularly important for sustainable development and the eradication of poverty.</p>	
<p>(b) Update the goals of each PA's management plans, taking into account the updated list of elements to be conserved and used sustainably</p>		

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
<i>Objective 1.4: Conduct a gap analysis using an updated list of conservation features i.e. components of biodiversity that should be protected, and prioritize them bearing in mind the threats posed to them and their ecological/biological and socioeconomic importance in the country.</i>		
(a) Conduct a gap analysis based on an updated list of biodiversity components that need to be protected (see Objective 1.3.a) and identify the species and communities of species, as well as the habitats/ecosystems/landscapes and ecosystem services that need to be protected.		Same as above
(b) Conduct studies and consultations on Important Bird and Biodiversity Areas, including wetlands of international importance, as well as ecologically and biologically significant coastal and marine areas; use the results, as appropriate, for the classification of these important areas; and assess their contribution to the representativeness of the conservation features in the national PA system.	Studies will be carried out to identify and describe the conservation features that should be protected, and prioritize them bearing in mind the threats posed to them and their ecological/biological and socioeconomic importance in the country, in the view of their future integration to the national PA system.	
(c) Recalibrate Marxan software parameters, and repeat the systematic conservation planning assessment using the updated conservation features.		
Strategic Goal 2: Anticipate and respond to ongoing and future environmental changes, focusing on changes caused by climate change		
<i>Objective 2.1: Increase knowledge on observed and projected impacts of climate change on biodiversity and associated ecosystem services in Sierra Leone, taking into account traditional and local knowledge</i>		

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
(a) Update projections of the future distribution of species and the status of habitats/ecosystems found in protected areas based on information provided by direct observations on the ground	<p>The bioclimatic models implemented in the PARCC project (Baker and Willis. 2014) could be used as a starting point.</p> <p>There is also a need to engage and support institutions dealing with climate, biodiversity, climate change adaptation and mitigation, including meteorological stations and research institutions, and encourage their collaboration.</p> <p>Collaboration with local communities will also be necessary for gathering relevant local and traditional knowledge, in accordance with Article 8 (j) of the CBD and national legislation.</p>	<p>The Meteorological Department under the Ministry of Transport and Aviation is the Focal point of climate change issues in Sierra Leone.</p> <p>National climate change committee (NCCC)/NAPA</p> <p>Relevant university departments and same ministries as above</p> <p>Local and international NGOs</p> <p>Representative of communities</p> <p>Conservation Society of Sierra Leone (CSSL)</p> <p>Njala University (NU)</p> <p>Fourah Bay College (FBC)</p> <p>Civil society</p> <p>Private sector</p>
(b) Establish monitoring mechanisms to regularly assess the trends of biodiversity components in PAs against modeling projections	<p>The country could put in place flagship species monitoring programmes as well as data storage and management with a dedicated website or using the national biodiversity clearing-house mechanism for managing and disseminating information.</p>	<p>Same as above, with University departments of biology and ecology</p>
(c) Develop species action and management plans based on the knowledge of species threat	<p>The plans could include:</p>	<p>Ministry of Agriculture, Forestry and Food Security (MAFFS)</p>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
status and vulnerability to climate change, and projections from species distribution models	<p>(i) Facilitating the dispersion of species that have low dispersion capacity in response to climate change, by removing barriers to their dispersal and/or ensuring connectivity between their habitats, or by relocating them manually in areas where climatic conditions are more favorable; or</p> <p>(ii) Manipulating the environment manually (e.g., through proactive management of bush fire regimes or hydrology) in order to create appropriate conditions for the range of species that have restricted margins of tolerance for environmental variables such as bushfires, floods, high temperatures or drought.</p>	<p>Ministry of Internal Affairs, Local Government and Rural Development (MIALGRD)</p> <p>Ministry of Lands, Country Planning and Environment (MLCPE)</p> <p>Ministry of Tourism and Cultural Affairs (MTCA)</p> <p>the Sierra Leone Environmental Protection Agency (SLEPA)</p> <p>Local and international NGOs</p> <p>Representative of communities</p> <p>Conservation Society of Sierra Leone (CSSL)</p>
Objective 2.2: Identify and appropriately manage areas that are resilient to climate change and areas that will include the future geographical distribution of species displaced by climate change		
(a) Building on the PARCC project results, update and improve the maps showing areas of resilience to climate change, based on information on the ground	Climate change resilient areas are areas where resilience to climate change is high either because changes due to climate change (in particular in temperature, rainfall and sea level) will have insignificant impact, or because models predict relatively low changes in these parameters. This activity will update the study of	<p>Ministry of Agriculture, Forestry and Food Security (MAFFS)</p> <p>Ministry of Lands, Country Planning and Environment (MLCPE)</p> <p>the Sierra Leone Environmental Protection Agency (SLEPA)</p> <p>Local and international NGOs</p>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
	Smith (2013b) based on information gathered on the ground.	Conservation Society of Sierra Leone (CSSL) Njala University (NU)
(b) Include areas resilient to climate change in the national PA system or apply other conservation measures	Areas that are resilient to climate change can serve as climatic refugia. In the process of expanding the PA system, particular attention should be paid to these areas and to ensuring the full participation and agreement of all groups of stakeholders, in particular local communities.	
(c) Drawing on the PARCC project findings and its methodology and using participatory approaches, identify options for areas where the national PA system could be expanded to take into account the future distribution of species	Ensure that, as far as possible, the areas to be protected are large enough to support the types of ecological and evolutionary processes that generate and sustain/maintain biodiversity.	National PA Authority Ministry of Agriculture, Forestry and Food Security (MAFFS) Ministry of Internal Affairs, Local Government and Rural Development (MIALGRD)
(d) Validate the findings on the ground in consultation and agreement with local communities and development sectors active in the region	Following existing guides (e.g. Dudley and Parish, 2006, and CBD PA e-module 1 Lesson 3 ²), the following shall be implemented through a participatory approach involving all stakeholders: ground truthing; identification and assembling of a relevant stakeholder team; prioritization of gaps to be filled taking into account areas where action is most urgent (based on irreplaceability and vulnerability analyses), potentially conflicting plans (e.g., expansion of human settlements,	Ministry of Lands, Country Planning and Environment (MLCPE)

² <https://www.cbd.int/protected/e-learning/default.shtml>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
	infrastructure or development plans and other land uses such as agriculture) and feasibility (e.g., 'easy win' areas); existing human (support of local communities, type of governance), financial, technical and institutional capacities; size and connectivity.	
<i>Objective 2.3: Develop, re-evaluate, restore and/or maintain ecological connectivity including corridors and stepping stones between protected areas, bearing in mind possible shifts in species ranges and contraction of some habitats resulting from climate change</i>		
(a) Evaluate the performance of PAs and effectiveness of the PA system in relation to the status of protected species in the face of climate change	If a PA was establish to protect a given species, assessments of the status of that species in time and in the face of climate change will need to be carried out to define the performance of the PA.	
(b) Evaluate the effectiveness and appropriateness of existing corridors and decide on the creation of new ones, based on when the ecological suitability of PAs is likely to become reduced because of climate change	Fragmentation and degradation of PAs may make individual PAs unsuitable for species protection and/or delivery of ecosystem services, and climate change is likely to cause shifts in species distributions. Corridors linking individual PAs can help alleviate this issue. For instance, corridors between the twin parks of Outamba and Kilimi could greatly enhance the ecological viability of the two parks. There is also a potential for the creation of (i) a corridor between Sierra Leone's Outamba Kilimi National Park and Guinea's Madina Oula and Orekaba Forest Reserve; and (ii) a permanent natural corridor between the Gola	Most of the actions under this objective are part of the functions of the National PA Authority (see The National Protected Area Authority and Conservation Trust Fund Act, 2012) Also: Ministry of Agriculture, Forestry and Food Security (MAFFS) Ministry of Finance and Development (MFD);

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
	Rainforest National Park, Tiwai and the Kambui South Forest Reserve in order to maintain Tiwai as an important natural area and harmonize its management with that of the GRNP (Sowa, 2012).	Ministry of Internal Affairs, Local Government and Rural Development (MIALGRD)
(c) Using the PARCC project findings, identify options for the location of connectivity corridors and validate the findings on the ground in consultation and agreement with local communities and development sectors active in the region	This action should use the findings from the PARCC project (Arnell <i>et al.</i> 2014) (see Section 2.6 above).	Ministry of Lands, Country Planning and Environment (MLCPE) Ministry of Fisheries and Marine Resources (MFMR) Ministry of Tourism and Cultural Affairs (MTCA)
(d) Designate and regulate such connectivity corridors as protected areas	This will be done through the development of management plans, and strengthening the enforcement of the appropriate legislation.	the Sierra Leone Environmental Protection Agency (SLEPA) Local and international NGOs Representative of communities Conservation Society of Sierra Leone (CSSL) Njala University (NU)
Strategic Goal 3: Strengthen the enabling environment for the successful implementation of the strategy		
<i>Objective 3.1: Integrate this strategy on protected areas and climate change in broader national strategies and plans</i>		
(a) Establish an inter-ministerial and inter-sectoral committee, or call on existing committees that will examine this strategy on protected areas and climate change and, if appropriate, endorse it and bring it to the attention of the Government through the Environment Protection Agency or the		Ministry of Lands, Country Planning and the Environment Ministry of Transport and Aviation (MTA) Ministry of Agriculture, Forestry and Food Security

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
Ministry of Lands, Country Planning and the Environment		Environment Protection Agency
(b) Integrate this strategy on protected areas and climate change into the National Adaptation Programme of Action (NAPA), National Adaptation Plan (NAP) and the National Biodiversity Strategy and Action Plan (NBSAP)	<p>As far as possible, undertake the integration at the conceptual stage of projects and take advantage of the fact that the National Adaptation Planning (NAP) process and the updating of the NBSAPs are under way in Sierra Leone. The two processes provide an opportunity for integrating elements identified in this strategy on protected areas and climate change.</p> <p>Consultations and joint information sessions gathering the authors of the updated NBSAP and the NAP will facilitate this integration.</p> <p>Annex 1 presents some details on a proposal on ways for integrating the strategy on PAs and climate change into the NBSAP, NAP and NAPA</p>	<p>National Steering Committee on Climate Change</p> <p>Ministry of Agriculture, Forestry and Food Security (MAFFS)</p> <p>Ministry of Finance and Development (MFD)</p> <p>Ministry of Internal Affairs, Local Government and Rural Development (MIALGRD)</p> <p>Ministry of Lands, Country Planning and Environment (MLCPE)</p> <p>the Sierra Leone Environmental Protection Agency (SLEPA)</p> <p>Representatives of local communities</p>
Objective 3.2: Strengthen the human, financial, institutional, legislative and technological capacities		
Human capacities		
(i) Develop and implement training programs on climate change and biodiversity conservation focussed on PA planning, design and management adapted to different levels of the society	<p>It is important to:</p> <ul style="list-style-type: none"> Build on ongoing and previous human capacity needs assessments (for example, through the activities initiated in the framework of NAPA, the 2012 second national communication on climate change or 	<p>National PA Authority</p> <p>Ministry of Agriculture, Forestry and Food Security (MAFFS)</p> <p>Ministry of Internal Affairs, Local Government and Rural Development (MIALGRD)</p>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
<p>and targeting all categories of stakeholders.</p>	<p>the GEF/UNDP National Capacity Needs Self-Assessment).</p> <ul style="list-style-type: none"> ▪ Link these training activities with those organized around climate projections and modeling and the training on biodiversity issues. ▪ Continue the training activities initiated by the PARCC project with the objective of establishing a critical mass of experts capable of collating, generating, analyzing and synthesizing relevant data to arrive at clear messages for decision-makers at all levels (government, local communities, economic sectors, etc.). <p>These training activities will enable local experts to (i) map species, ecosystems, landscapes and waterscapes, as well as their functions and services; (ii) describe their status and trends across multiple anthropogenic and natural pressures, particularly climate change, while highlighting their vulnerability; (iii) project their distribution, status and trends in the coming years / in response to multiple factors of loss of biodiversity, with emphasis on climate variability, and projecting the evolution of factors using modeling; (iv) inventory the</p>	<p>Ministry of Lands, Country Planning and Environment (MLCPE)</p> <p>the Sierra Leone Environmental Protection Agency (SLEPA)</p> <p>Local and international NGOs</p> <p>Njala University (NU)</p>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
	<p>areas that can serve as refuge for species when climate conditions become unfavourable or species having a naturally high resilience to climate change; (v) Use the Marxan software for systematic planning for conservation.</p> <p>National experts should continue to improve the methods learned in the PARCC project with the new data collected and guide research in the collection of data.</p> <ul style="list-style-type: none"> ▪ Adequately coordinate all relevant ongoing and planned training programmes, including programmes of the CBD, UNCCD and UNFCCC, so as to ensure coherence and synergies, including through the involvement of resource-persons from academia, government, local community (for local knowledge, practices and know-how regarding biodiversity, sustainable use and climate), NGOs and the business sector. 	
(ii) Organize and strengthen training activities on the drafting of project proposals for resource mobilization, including human, technological and financial resources for the sustainable		

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
management of protected areas that takes account of climate change		
(a) Financial capacities		
(i) Mobilize financial resources by exploring traditional and innovative mechanisms	<p>Several sources of funding can be explored, e.g. the Global Environmental Facility (GEF), the Fund for Least Developed Countries, the Special Climate Change Fund and the Adaptation Fund under the Kyoto Protocol. Several objectives and programs envisaged for the sixth period of the GEF fund replenishment (GEF-6) coincide with the actions foreseen in this strategy. These are some relevant examples: (i) improve the sustainability of protected area networks, (ii) reduce threats to biodiversity of global importance, (iii) promote innovation, technology transfer, and support policies and strategies on climate change, (iv) improve resilience of forests to climate change through the sustainable forest management, and (v) restore forest ecosystems to recover ecosystem services.</p> <p>Other mechanisms such as REDD+ are also worth exploring. Private sector involvement in biodiversity management (e.g., the Tacugama Chimpanzee Rehabilitation project, which cooperated with the Sierra Leone National Airlines in 2004 – 2006 in promoting the project)</p>	<p>Ministry of Agriculture, Forestry and Food Security (MAFFS)</p> <p>Ministry of Finance and Development (MFD)</p> <p>National PA Authority</p>

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
	can also generate funds for biodiversity conservation.	
(b) Institutional capacities	In accordance with the ecosystem approach, the long-term implementation of management requires stable institutions, legal and political frameworks, monitoring programs, and outreach and awareness programs.	
(i) Make more operational and effective the existing institutions for research, training and/or management of natural resources, including inter-institutional bodies and coordination mechanisms, by giving them the financial, technological and human means necessary and by ensuring the integration of climate change considerations in biodiversity conservation	Projects described in the NAPA list institutions requiring ecosystem rehabilitation or reconstruction for climate monitoring, training etc. (e.g., Faculty of Environmental Science at Njala University, the PUMA (Preparation for the Use of Meteorological satellite in Africa) station at Lungi and other meteorological / climate monitoring stations). These institutions could be supported in the context of this strategy because their focus on conservation areas can contribute to the reduction of the impacts of climate change, in particular projects No. 6 (Development of an Integrated Natural Resources and Environmental Management System for Sierra Leone), No. 9 (Establishment of Forest Reserves, Protected Areas and National Parks/Sanctuaries in Sierra Leone) and No. 10 (Management and Protection of Forest Reserves and Catchment areas in Sierra Leone including Wetlands)	

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
(ii) Integrate considerations linked to the adaptation to climate change in the application of the 2012 National Protected Area Authority and Conservation Trust Fund Act, and previous related laws.	The previous laws include the 1995 National Environmental Policy of Sierra Leone, the 1998 Forestry Law 1998 and the 2000 Environmental Protection Law.	
(iii) Strengthen the implementation of laws and decrees relating to the conservation and sustainable management of natural resources, particularly in the face of climate change	The ways and means will include training, awareness-raising programs, the provision of necessary equipment or resources, and the promotion and use of incentives that will support law enforcement	
(c) Technological capacities		
(i) Identify the technologies necessary for the conservation and sustainable use of biodiversity and associated ecosystem services, as well as technologies not yet available in the country for biodiversity monitoring and for recording climate data	<p>Several technologies needed to implement more actions of this strategy on protected areas and climate change are not yet available in Sierra Leone. This activity should focus on these technologies not yet available or widespread in the country.</p> <p>It will be necessary to include their acquisition in projects aiming at mobilizing funds and/or adapt and validate them in accordance with national and international legislation or as part of the Nagoya Protocol.</p>	
(ii) Include in research projects subjects that will enable the collection of useful	The type of information needed to improve the systematic conservation planning as it was used	

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
information for the improvement of methods to use in the implementation of this strategy, particularly to reduce uncertainties and improve the interpretation of PARCC findings	in the PARCC project include long-term studies of the responses of species to climate change. In addition, the projections obtained through modeling in the PARCC project are appropriate for large area, but they may not capture the details often needed at the local level for decision-makers. Researcher training should enable them to check the results of the models on the ground and/or improve existing methods.	
Objective 3.3: Strengthen communication, education, research and awareness on the issues of protected areas, the impact of climate change and adaptation to climate change		
(a) Support ongoing activities to raise the country's level of information, education and communication on climate change for better decision-making and thus enhance awareness of the potentials of PAs socioeconomic and ecosystem services as well as climate risks.		Ministry of Agriculture, Forestry and Food Security (MAFFS) the Sierra Leone Environmental Protection Agency (SLEPA) Njala University (NU) Fourah Bay College (FBC) National PA Authority
(b) Organize the collected data and information, including from local and traditional knowledge, into user-friendly databases in accordance with national and international legislation, and ensure that they are widely	The 5 th National Report to the CBD indicates that development of a biodiversity database is under way. The national clearing-house mechanism should be developed to become the national mechanism	

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
accessible in awareness programs, education and decision-making	that will organize and harmonize existing information systems of environmental management, and make the information on all aspects of biodiversity widely accessible including relevant climate change data and information on its impact.	
(c) Support research to generate additional data on climate change and its impact, and in the field of protected areas and biodiversity conservation in general	Particular efforts should be devoted to areas where the PARCC project identified gaps in data, including on the interactions between PAs, local communities and climate change.	
Objective 3.4: Strengthen coordination and cooperation including transboundary cooperation		
(a) Ensure proper coordination between government bodies dealing with protected areas and adaptation to climate change	<p>This could be achieved by establishing an interdepartmental committee for this coordination</p> <p>Cooperation agencies and organizations often operate at different spatial scales and objectives that could be related to different levels of biological organization (species, ecosystem, landscape). Inter-agency complementarity and synergy should be encouraged in implementing this strategy.</p>	<p>National PA Authority</p> <p>Ministry of Agriculture, Forestry and Food Security (MAFFS), through its Forestry Division</p>
(b) Strengthen cooperation between the government and local communities, within ministries, and among ministerial departments and strengthen partnerships involving NGOs and the	Cooperation with local communities and among ministerial departments, as well as partnerships involving NGOs should be promoted.	

Key Actions	Potential specific activities, policy recommendations and brief explanations	Ministries (coordination or contribution) and contributors
private sector for the best approaches to manage PAs in the face of climate change		
(c) Foster cross-border initiatives for an integrated and sustainable management of protected areas that takes climate change into account	<p>Cooperation should also be promoted and strengthened with neighboring countries for transboundary protected areas.</p> <p>Transboundary cooperation implies among other requirements (i) the formalization of a framework for concerted intervention between States for the cross-border establishment and management of climate-change-adapted transboundary PAs, and (ii) some harmonization of legislation at the sub-regional level in the field of management of transboundary PAs resources taking into consideration the impact of climate change.</p> <p>The possible creation of transboundary PAs and corridors in Sierra Leone has been reported, e.g. for the threatened forests in the Upper Guinea forest eco-region crossing Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Ghana and Togo; the Gola Rainforest National Park of Sierra Leone and the proposed Gola National Forest of Liberia (selected as a pilot site for the PARCC project); and the corridor between Sierra Leone's Outamba Kilimi National Park and Guinea's Madina Oula and Orekaba Forest Reserve.</p>	<p>The National PA Authority is tasked with representing the Government of Sierra Leone in the negotiation of Transboundary Protected Area Agreements and development and implementation of associated policies, strategies and plans.</p>

4. Ways and means to implement the strategy

Principles

Implementation of this strategy on protected areas and climate change is guided by the principles and approaches engrained in various policy and legal documents that underpin how Sierra Leone promotes sustainable development goals to achieve poverty reduction in the country.

1. The natural wealth through the goods and services of its biodiversity supports the well-being and livelihoods of the populations, and for this reason natural resources need to be protected and used sustainably.
2. The impact of climate change is a reality that all countries, especially the least developed, have to face. It is thus imperative for each country to strengthen its ability to adapt in order to ensure the well-being of its peoples and sustainable development.
3. Effective management of natural resources and protection of the environment, including by establishing a network of protected areas, ecologically representative, well connected and managed in a fair and effective way, constitutes an essential pillar for adaptation to climate change and poverty eradication.
4. The ecosystem approach is the primary framework for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. This approach uses adaptive management in order to anticipate changes in the condition and operation of the components of biodiversity, namely genetic resources, species and communities formed by these species, and the habitats and ecosystems and/or landscapes. This approach requires a management that can adapt to the complex and dynamic nature of ecosystems, knowledge and understanding of their functioning, based on the experiences and projections in time and in space.
5. Ecosystem-based approaches to conservation and climate change have the potential to contribute to livelihood sustenance and food security, sustainable water management, disaster risk reduction and biodiversity conservation.

6. Most of the biodiversity management problems are complex and must involve all sectors of the society, and require the participation of all stakeholders, including local communities and authorities, cooperation within the government, between the various ministerial departments, among public and private organizations, non-governmental and intergovernmental organizations. Thus, it is necessary to use interdisciplinary, intersectoral and multi-scale approaches in the management of protected areas taking into account climate change, and ensure a fair sharing of benefits and costs at all levels, including from the use of traditional knowledge.

Participatory planning and implementation

As noted in the 5th National Report, in Sierra Leone, public participation in biodiversity management is present in various ways (e.g., in planning meetings, in discussion programmes on radio or TV, awareness-raising workshops, and management of sacred grooves). However, in practice, involvement of stakeholders (local communities, civil society and NGOs) in policy development and implementation in biodiversity management is often inadequate. Lack of strategies on civil society involvement and lack of incentives to promote public participation in biodiversity conservation are issues under consideration. Efforts should be made to ensure natural resource co-management, which is one of the principles put forward in the 2012 National Protected Area Authority and Conservation Trust Fund Act, for an effective sharing of power, authority, responsibility, rights and benefits between government and resource users (including in particular local communities) in the management of natural resources.

Development of the NAPA and NBSAP used participatory processes involving stakeholders, particularly local communities and multidisciplinary teams. This approach is recommended in all biodiversity conservation and climate change projects. This experience is very appropriate in the development and finalisation of this strategy and its implementation.

Monitoring and follow-up

Sierra Leone does not yet have a comprehensive monitoring mechanism in place. The development of a national set of indicators and standards for national-level monitoring of biodiversity is

still in progress³. Various bodies have been set up to monitor achievement of plans and programmes adopted in the country. They include interdepartmental supervisory boards, technical management committees and/or regional monitoring committees. Although monitoring reports often do not mention the effective participation of the various entities, their experiences should guide the setup of monitoring, reporting and verification mechanisms for the implementation of the actions identified in this strategy, including protocols, standards and indicators, which could also be shared and harmonized within the West African region. The PARCC project also recommended the regular monitoring of selected amphibian, bird and mammal species, as well as the availability and quality of these species' habitats, and climatic factors (Carr, 2015). Training in biodiversity surveys and monitoring technologies and the provision of necessary tools and equipment are essential.

Monitoring of progress in the implementation of this strategy could be carried out as part of the monitoring of the implementation of the NBSAP with a long-term perspective in mind. One of the indicators that could be integrated to the assessment of progress could be the level of use of data, findings and methodologies from the PARCC project (see section 2 above on "Overview of PARCC project findings of relevance to Sierra Leone"). The revised Management Effectiveness Tracking Tool (METT) (Belle et al. 2012) could also help monitor how well climate change aspects have been incorporated into PA design management.

It is expected that results from the implementation of this strategy will be reported in national reports submitted to the CBD and the UNFCCC.

As recommended in the 5th National Report, all needed resources for monitoring biodiversity status should be available to keep the authorities alert and responsive to the causative factor(s) with minimum delay.

Mobilizing financial resources

Lack of financial resources is a major obstacle in achieving the objectives of plans and programs related to biodiversity, including PAs. There is an urgent need to diversify the sources of funding and

³ <https://www.cbd.int/countries/?country=sl>

ensure that funding reaches communities whose conservation activities are essential. A viable and sustainable financing of PAs requires changes in the way that funding is conceptualized and used.

A range of innovative financing mechanisms have been developed and recommended to increase funding for PAs in the framework of international initiatives, such as under the CBD POWPA. Furthermore, through the PARCC project, a review of options for managing and financing PAs in the face of climate change was carried out; it identified a range of adaptation strategies and provided some guidelines on how to select and implement them (Smith 2013b). It is important that national experts consider these mechanisms and identify the most appropriate ones for the country. Among the prerequisites, the description of the importance of PAs in project proposals must convince those who take decisions about funding at both the national and international levels. While ecological aspects of biodiversity conservation should be described, it is more and more critical to identify and put forward the socio-economic benefits of PAs for the well-being of the populations and the country's sustainable development. This could be done particularly through the development of business plans for each PA. It is also important that more national experts develop or strengthen their ability to draft project proposals and are further trained in financial resource mobilization.

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Annex 1

Proposal for the integration of strategic elements for a PA system resilient to climate change in the National Biodiversity Strategy and Action Plan (NBSAP), National Adaptation Programme of Action (NAPA) on climate change, and climate change National Adaptation Plan (NAP) development processes.

Integration is best done at the conceptual stage of projects and complex development interventions, so that it is taken into account in national budgets and given opportunities for funding from multiple sources. Here we consider how the project results could be integrated into the:

- National Biodiversity Strategy and Action Plan (NBSAP) of the Convention on Biological Diversity (CBD);
- National Adaptation Programme of Action (NAPA) and National Adaptation Plan (NAP) of the United Nations Framework Convention on Climate Change (UNFCCC); and
- Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development.

A. Integration into the National Biodiversity Strategy and Action Plan (NBSAP)

Integration of elements of this strategy for a protected area system resilient to climate change in the NBSAP is possible at two levels: (i) the implementation of the Programme of Work on Protected Areas (POWPA) of the Convention on Biological Diversity (CBD), and (ii) the achievement of Aichi Biodiversity Targets 11, 12 and 15.

(a) Integration during the implementation of the POWPA: It is recognized in the POWPA that PAs provide opportunities for adaptation to cope with climate change and may contribute to carbon sequestration and thus to the mitigation of climate change. The PARCC project provided, among other outputs, a list of species considered vulnerable to climate change, as well as the level of species turnover expected in the protected areas of the country, and guidelines for protected area managers in the face of climate change. All these outputs are useful in the implementation of POWPA Goals 1.4 to 'significantly improve the planning and management of protected areas', particularly activity 1.4.5 on integrating adaptation to climate change in the planning, designing and management of PA systems, and Goal 1.5 to 'prevent and mitigate the negative impacts of key threats to protected areas', climate change being one of the drivers of biodiversity loss.

(b) Integration during the achievement of Aichi Biodiversity Targets 11 (on the conservation by 2020 of at least 17% of terrestrial and inland water and 10 % of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, by means of ecologically representative protected area networks and well-connected as well as effectively and equitably managed protected areas), 12 (on avoidance of the extinction of endangered species and their recovery and maintenance) and 15 (on improving ecosystem resilience and the contribution to carbon stock, thus contributing to climate change mitigation and adaptation). These targets on PAs and climate change were adopted as part of the Strategic Plan for Biodiversity 2011-2020 and are being translated into national targets within the revised NBSAP. Sierra Leone is in the final stages of updating its NBSAP. The time is thus appropriate for inserting in the NBSAP elements from this strategy on PAs and climate change in the statement of Sierra Leone's objectives and actions. The National Liaison Officer and other key persons in the PARCC project (including members of the National Protected Area Authority and Conservation Trust Fund, the Environment Protection Agency and the UNFCCC Focal Point) should inform the Members of the National Steering Committee, the Planning Committee and the Consultants regarding the update of the 2006 NBSAP about the outputs of the PARCC project and guide them on how to integrate them in the revised NBSAP.

It will be necessary to work in a participatory manner to exploit the findings from the PARCC project to concretely define the actions to take for the integration of elements into the NBSAP. These actions will focus essentially on the creation of new protected areas and/or the expansion of existing ones to improve the connectivity and resilience of the national PA network in the face of climate change. It will thus be necessary that participants in the PARCC project understand well and own the outputs from the project and communicate them to the persons involved in the implementation of the NBSAP and the POWPA action plan. It will be particularly useful to:

(a) Integrate the results of the PARCC project, notably on (i) gaps identified in the representation of the existing national PA system (relative to land cover types, elevation zones, ecoregions and current and future expected distributions of mammal, bird and amphibian species), (ii) the vulnerability of mammal, bird, amphibian, reptile and freshwater fish species to climate change, and the presence of areas resilient to climate change in the country, and (iii) the expected

species turnover within protected areas, and species expected to gain or lose in climate suitability; and develop and select options for the expansion of existing PAs and/or the creation of new PAs;

(b) Develop action plans to protect vulnerable species, and establish or restore ecological corridors to ensure the migration of species that will be forced to shift their range in search of more suitable climatic conditions;

(c) Consider the finding of the PARCC project that the current PA system of Sierra Leone needs to be increased in order to ensure an adequate representation of all the components of biodiversity requiring protection. The Marxan software used in the PARCC project has identified areas suitable for the establishment or extension of PAs, which should be considered. The Government of Sierra Leone has plans to establish marine protected areas and, as noted in the NAPA, give legal reserve status to currently unprotected forests. Unprotected IBAs and partially protected IBAs could also be candidates for a rapid classification and regulation as protected areas. In doing so, the country will include many areas in its PA system as one of the first steps for addressing changes that would take place due to climate change.

B. Integration into the National Adaptation Programme of Action (NAPA)

Establishment and effective management of PAs is a prominent feature of Sierra Leone's NAPA. Urgent and immediate adaptation PA actions identified in the programme include: conducting a natural resource inventory and mapping degraded areas; establishing new forest reserves, PAs and national parks; developing management plans to improve PA effectiveness; increasing the protection of forest catchment areas; establishing a technical support unit for PA management; and restoring and protecting critical fisheries habitats.

Actions planned in "Project No. 6: Development of an Integrated Natural Resources and Environmental Management System for Sierra Leone," "Project No. 9: Establishment of Forest Reserves, Protected Areas and National Parks/Sanctuaries in Sierra Leone," and "Project No. 10: Management and Protection of Forest Reserves and Catchments areas including Wetlands in Sierra Leone" were considered while identifying and developing actions listed among elements for a national strategy on PAs and climate change. Implementation of these projects will also greatly benefit from the actions listed in Table 1 above.

Sierra Leone submitted its Second National Communication on climate change to UNFCCC in 2012. It contains very little on protected areas and nothing on animal species apart from livestock. Vulnerability and adaptation assessments were undertaken for the following sectors: agriculture, forestry, water resources, human health, coastal zones and human settlements and tourism. The Second National Communication used the habitat suitability index (HSI) model to document climate change impact for specific species of concern. This model can be enriched with the findings from the PARCC project. The strategic elements proposed in this document and the findings from the PARCC project will provide guidance on (i) anticipating the impact of climate change by improving existing PAs management, and (ii) selecting areas for the establishment of new protected areas so that shifts in species ranges and threat status due to climate change can be taken into consideration. In addition, PAs should be managed in ways that will enhance the chances of ecosystems to maintain their natural resilience and functioning (i.e. provision of ecosystem services) and thus contribute to climate change mitigation by retaining carbon.

C. Integration into the National Adaptation Plan (NAP)

The National Adaptation Plan (NAP) process was established under the Cancun Adaptation Framework in 2010 (COP 16/ CMP 6) to enable Parties to formulate and implement national adaptation plans (NAPs) as a means of identifying medium- and long-term adaptation needs and developing and implementing strategies and programmes to address those needs⁴. The NAP process is meant to complement the existing short-term projects under the National Adaptation Programmes of Action (NAPAs) and play a critical role in reducing vulnerability and building adaptive capacity by mainstreaming climate change adaptation into all sector-specific and national development planning.

The guidelines for NAP processes include:

(a) Laying the groundwork and addressing gaps (Element A) by: (i) initiating and launching the NAP process; (ii) stocktaking, i.e., identifying available information on climate change impacts, vulnerability and adaptation and assessing gaps and needs of the enabling environment for the NAP process; (iii) addressing capacity gaps and weaknesses in undertaking the NAP process; and (iv) comprehensively and iteratively assessing development needs and climate vulnerabilities;

⁴ http://unfccc.int/adaptation/workstreams/national_adaptation_plans/items/6057.php

(b) Preparing the following (Element B): (i) analysing current climate and future climate change scenarios; (ii) assessing climate vulnerabilities and identifying adaptation options at the sector, subnational, national and other appropriate levels; (iii) reviewing and appraising adaptation options; (iv) compiling and communicating national adaptation plans; and (v) integrating climate change adaptation into national and subnational development and sectoral planning;

(c) Implementation strategies (Element C); and

(d) Reporting, monitoring and reviewing implementation of the plan (Element D)

The NAP process is country-driven and participatory. Its continuous and iterative nature provides unique opportunities to integrate the findings from the PARCC project at various steps of the planning process. Sierra Leone's NAP process is being supported by the USAID Climate Change Resilient Development program and ECOWAS, and will take into account the adaptation component in the Sierra Leone's Intended Nationally Determined Contribution (INDC).

D. Integration into the Sustainable Development Goals (SDGs)

Since NBSAPs, NAPs and NAPAs are strategies and actions that contribute to the sustainable development of Sierra Leone, the integration of the strategic elements on PA systems resilient to climate change will be even more effective if the elements and associated policy recommendations are integrated in measures taken to achieve the Sustainable Development Goals adopted in 2015, particularly targets 13 ('Take urgent action to combat climate change and its impacts'), 14 ('Conserve and sustainably use the oceans, seas and marine resources for sustainable development') and 15 ('Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss').

Annex 2

Indicative list of laws of relevance to the strategy for protected areas resilient to climate change in Sierra Leone

Year	Law and policy	Relevance to the strategy for protected areas resilient to climate change
2012	The National Protected Area Authority and Conservation Trust Fund Act	To provide for the establishment of the National Protected Area Authority and Conservation Trust Fund; promote biodiversity conservation, wildlife management, research; provide for the sale of ecosystems services in the National Protected Areas; and provide for other related matters.
2010	The Forest Policy	The Forestry Policy (2010) highlights critical challenges in the forestry sector such as overlapping and conflicting institutional mandates, lack of capacity of the Forestry Division and the need for greater policy support to involve non-governmental stakeholders and communities in forest management.
2010	National Fisheries Policy (2010) revised from 1994 Fisheries Management and Development Act, complemented by the 1995 Fisheries Regulations	To make better provisions for the management, planning and development of the fisheries and the fishing industries of Sierra Leone, and for related matters.
2008	Bumbuna Conservation Area Act	To provide for the establishment of the Bumbuna Watershed Management Authority; coordinate sustainable land use and agriculture programmes in an environmentally compatible manner in the Bumbuna Watershed; promote environmental management and biodiversity conservation in the Bumbuna Conservation Area, including the hydroelectric dam.
2008	Environment Agency Protection Act	To establish the Sierra Leone Environment Protection Agency and provide for the effective protection of the environment and for other related matters
2007	Agricultural Policy (draft)	To promote the rational and sustainable use of natural resources, and sensitize the public on the importance of effective use of natural resources; the current state of their

Year	Law and policy	Relevance to the strategy for protected areas resilient to climate change
		management and appropriate measures to control environment degradation
2003	The Mines and Minerals Act	To promote local and foreign investment in the mining sector; ensure that management of the mineral sector is transparent and accountable in accordance with international best practice; improve the welfare of communities adversely affected by mining; and introduce measures to reduce the harmful effects of mining activities on the environment.
2000	The National Environmental Protection Act	To recommend EIA for proposed development projects that may have adverse effects on biodiversity. Guidelines and Procedures to undertake EIA are in place.
1988	The Forestry Act	The principal legislation guiding the management and regulation of forestry and forest reserves in Sierra Leone.
1972	The Wildlife Conservation Act	The principal legislation guiding the management and regulation of wildlife and protected areas. The main objective of the wildlife policy section was to integrate the propagation, conservation and exploitation of wild animal life and wild vegetation into the national land use policy.

It should be noted that the 2013 National Development Plan, the Agenda for Prosperity, is Sierra Leone's Third Generation Poverty Reduction Strategy Paper (2013 – 2018) and that the 2015 Climate Change Strategy and Action Plan was drafted by the Environment Protection Agency of Sierra Leone to implement measures needed to address climate change in Sierra Leone.

Annex 3

Indicative list of regional and global agreements ratified by Sierra Leone.

A. Global agreements

1. Convention on Biological diversity (CBD)
2. Convention on International Trade in endangered species of wild fauna and flora (CITES)
3. Convention on Wetlands of International Importance (RAMSAR)
4. Convention Covering the protection of the World cultural and Natural Heritage
5. United Nations Convention on the Law of the Sea
6. United Nations Convention to Combat Desertification (UNCCD)
7. United Nations Framework Convention on Climate Change (UNFCCC)
8. Vienna Convention for the Protection of the Ozone Layer
9. Montreal Protocol on Substances that Deplete the Ozone Layer and the London Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer
10. Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal
11. Treaty Banning Nuclear Weapons Tests in the Atmosphere, in outer space and under water

B. Regional agreements

1. Convention on the African Migratory Locusts
2. Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (WACAF)
3. Protocol concerning co-operation in combating marine pollution in cases of Emergency in West and Central African Regions (WACAF)
4. Bamako Convention on the Ban of the Import into Africa and the Control of Trans-boundary Movement and Management within Africa of Hazardous Wastes
5. Convention Establishing a Permanent Inter-state Committee for the Control of Drought in the Sahel (CILSS)

Annex 4

Terms of reference for the consultancy on ‘Development of strategies and policy recommendations to enhance the resilience of West African protected areas to climate change impacts’.

The Consultant shall:

Produce adaptation strategies for the best approaches to manage PAs for climate change, building on the results of the projects scientific outputs, and develop policy recommendations for PAs in the face of climate change, including draft policy documents, at the regional level and national level for each of the five PARCC project countries.

In particular the Consultant shall carry out the following activities:

- Map/Review the legal and policy framework of each country, focusing on legal aspects related to environmental management, especially in relation to protected areas and climate change; this will also include identifying:
 - Regional and international obligations relating to the regional policy recommendations
 - National plans and policies relating to the national policy recommendations for the five project countries
- Consider how the policy recommendations being developed could be integrated into NBSAP and NAPA development and implementation.
- Identify the relevant government bodies and representatives in all relevant sectors for each project country, with the help of project partners, including the executing agency and the NLOs from each country.
- Travel to the region and, in particular, each project country (provided that the security situation allows it) to work with appropriate government representatives on the development of the policy recommendations.
- Present the draft adaptation strategies and policy recommendations at the final regional meeting of the project.
- Formulate adaptation strategies for PAs in the face of climate change at the regional level and for the five project countries on the basis of the project scientific outputs, including the systematic conservation planning systems.

- Develop regional policy recommendations and national policy recommendations, with draft policy documents including innovative management systems for PAs and biological corridors, in collaboration with country representatives.

The strategies and policy recommendations will be detailed in concise reports (20 to 30 pages each), one at the regional level, and one for each of the 5 project countries. The consultant will work in close collaboration with the Project Management Unit, UNEP-WCMC, and the Project Regional Unit, IUCN PACO, as well as technical partners.

The Consultant shall deliver the following outputs:

- A. A report outlining strategies for PAs to adapt to climate change and policy recommendations for PAs in the face of climate change at the regional level (20 to 30 pages) (after consultation with country representatives).
- B. A report outlining strategies for PAs to adapt to climate change and policy recommendations for PAs in the face of climate change at the national level for each of the project countries (5 reports of 20 to 30 pages each) (after consultation with country representatives).
- C. A brief report on meetings held with government representatives and other relevant stakeholders in the project countries and the West Africa region (including additional discussions held remotely).

Annex 5

Ways through which the strategic elements for PAs to adapt to climate change and policy recommendations for PAs in the face of climate change were developed for Sierra Leone.

Activity in the terms of reference	Ways and means
Preparatory phase	<ol style="list-style-type: none"> 1. Consultations: UNEP-WCMC, IUCN PACO, Secretariat of the Convention on Biological Diversity 2. Development of lists of people that could be contacted in Sierra Leone and in the PARCC project partner organizations. 3. Review of documents published by the PARCC project on Sierra Leone and other relevant national documents including in particular the NBSAP, NAPA, the national communications on climate change, the 2014 Fifth National Report on biodiversity, the 2012 National Protected Area Authority and Conservation Trust Fund Act, PRSP, various conservation and natural resources Acts, Sierra Leone Vision 2025, CBD and GEF websites, http://sierra-leone.org.
Map/Review the legal and policy framework of each country, focusing on legal aspects related to environmental management, especially in relation to protected areas and climate change	See Annexes 2 and 3 above
Consider how the policy recommendations being developed could be integrated into NBSAP and NAPA development and implementation	See Annex 1 above
Identify the relevant government bodies and representatives in all relevant sectors	See column 3 in Table 1. The list was prepared based on information in the NAPA, the 2003 BSAP and the 2014 Fifth National Report to the CBD.

for each project country, with the help of project partners, including the executing agency and the NLOs from each country	
Travel to the region and, in particular, each project country (provided that the security situation allows it) to work with appropriate government representatives on the development of the policy recommendations	A visit to Sierra Leone was not possible because of the Ebola outbreak. Government representatives were consulted during the final regional meeting of the PARCC project and through email exchange after that meeting.
Present the draft adaptation strategies and policy recommendations at the final regional meeting of the project	Presentations were made at the final regional meeting of the PARCC project held in Banjul, The Gambia from 25 to 29, 2016.
Formulate adaptation strategies for PAs in the face of climate change at the regional level and for the five project countries on the basis of the project scientific outputs, including the systematic conservation planning systems.	See sections 3 and 4 including Table 1 and annex 1.
Develop regional policy recommendations and national policy recommendations, with draft policy documents including innovative management systems for PAs and biological corridors, in collaboration with country representatives	See rationales in section 3, section 4 and column 2 in Table 1.

Annex 6

List of individuals consulted during the final regional meeting of the PARCC project and contacted after that meeting.

Name	Role/Institution
Kate M. B. Karemo-Garnett	Director, Protected Area Management, National Protected Area Authority and Conservation Trust Fund, Ministry of Agriculture, Forestry and Food Security
Sheku Gibril Kamara	National Protected Area Authority
Syl-Brians Kamara	Environment Protection Agency
Alpha Bockarie	UNFCCC focal point, MET Department
Mannah Swarray	Environment Protection Agency