THE REPUBLIC OF THE GAMBIA

THE NATIONAL BIODIVERSITY STRATEGY

AND ACTION PLAN (2015 – 2020)

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ACKNOWLDGEMENTS

The National Biodiversity Strategy and Action Plan (NBSAP) represent a collaborative effort, with a large number of contributors from all sectors and spheres of government, NGO's as well as civil society.

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ACRONYMS

ABS	Access and Benefit Sharing
AEWA	African Eurasian Water Bird Agreement
ANR	Agricultural and Natural Resources
ANRP	Agricultural and Natural Resources Policy
ATK	Associated Traditional Knowledge
BTF	Biodiversity Trust Fund
CBD	Convention on Biological Diversity
CDF	Community Development Fund
CFCs	Community Forest Committees
CITES	Convention on trade of Endangered Species
CMS	Convention on Migratory Species
CRR	Central River Region
CSO's	Civil Society Organizations
DCD	Department of Community Development
DOF	Department of Forestry
DOFISH	Department of Fisheries
DPWM	Department of Parks and Wildlife
DWR	Department of Water Resources
EEZ	Exclusive Economic Zone
EIA	Environment Impact Assessment
GALDEP	Gambia Lowland Development Project
GAMSIF	Gambia Agricultural Sustainable Investment Framework
GBMIS	Gambia Biodiversity Management and Institutional Strengthening
GBoS	Gambia Bureau of Statistics
GEAP	Gambia Environment Action Plan
GEF	Global Environment Facility
GNAIP	Gambia National Agricultural Investment Plan
GOTG	Government of the Gambia
GR	Genetic Resources
IAS	Invasive Alien Species
ICAM	Integrated Coastal Area Management
ICCA'S	Indigenous Community Conservation Areas
IDB	International Development Bank
IMPAC	International Marine Protected Area Congress
ISN	Inter-sectoral Network
IWRM	Integrated Watershed Resources Management
LRR	Lower River Region
MAB	Man and Biosphere
MDGs	Millennium Development Goals
MEAs	Multilateral Environment Agreements
MOE	Ministry of Energy
MOECCWW	Ministry of Environment, Climate Change, Water and Wildlife

MOFEA	Ministry of Finance and Economic Affairs
MOHERST	Ministry of Higher Education Research Science and Technology
MOTIE	Ministry of Trade, Industry and Employment
MPA	Marine Protected Areas
MSY	Maximum Sustainable Yields
NAMA	Nationally Appropriate Mitigation Actions
NAP	National Adaptation Plan on Desertification
NAPA	National Adaptation Action Plan
NBR	North Bank Region
NBSAP	National Biodiversity Strategy and Action Plan
NEMA	National Environmental Management Act
NARICA	New Africa Rice
NFA	National Forest Assessment
PAs	Protected Areas
PAGE	Programme for Accelerated Growth and Employment
PoWPA	Programme of Work on Protected Areas
PPP	Public Private Partnership
PRSP	Poverty Reduction Strategy Papers
RAMPAO	Reseau des Aires Marine Protégée's d' Afrique De L'Ouest
SEA	Strategic Environmental Assessment
SLMP	Sustainable Land Management Project
SOER	State of Environment Report
TKs	Traditional Knowledge's
TSN	Technical Services network
TVET	Technical Vocational Education and Training
UNDP	United Nation Development Programme
UNFCCC	United Nation Framework Convention on Climate Change
URR	Upper River Region
UTG	University of the Gambia
WCR	West Coast Region
WFD	German Community Development Service- NGO

FOREWORD

Consistent with the biodiversity-specific orientation of our National Mission Statement of the Gambia Incorporated -----vision 2020 of ''guaranteeing a well balanced ecosystem'' and the highlights of the vision, our overall Biodiversity vision, is ''to create a society in harmony that sees itself as an integral part of nature, recognizes different life forms, sustainably uses natural resources and maintains for posterity a nurturing and dynamic world rich in biodiversity''. I am confident that, the successful implementation of the revised NBSAP, will not only be a remarkable stride towards our goal of building a society which is in harmony with nature, but it will also constitute a solid basis for sustainable growth and development and a major step towards the realization of the ambitious goal of our shared national vision.

Wildlife resources constitute important biotic assets of the country from both ecological and economic view point. Over the last decade, the Gambia has invested great efforts to preserve its natural heritage. Biological diversity has since 1977, when the Banjul Declaration was pronounced to solemnly declare governments' untiring efforts to conserve for now and posterity, a wide spectrum as possible of our remaining flora and fauna, appeared as one of the most important conceptual developments.

The National Biodiversity Strategy and Action Plan is an important instrument to guarantee the conservation of biodiversity in the Gambia, as well as equitable sharing of benefits of its use. This document is also a contribution to the implementation of the three objectives of the convention on Biological Diversity.

Essentially, it provides a unifying opinion which encompasses all genes, species, habitats and ecosystems, thus covering everything from a wild plant's genes to the high seas. The Gambia's natural capital in the form of ecosystems, biodiversity and natural resources underpins the economy and well being of society. The diversity of biological resources and the interaction between them are vital for development and growth of Gambian population and cannot afford to ignore the growing proof of the irrevocable erosion of our livelihood. The destruction of forests, the shrinking of natural habitats due to rapid population growth and urbanization, the sharp decline in the numbers of wild mammals indicate the urgency of acting now to meet our biodiversity responsibilities. Due to the NBSAP contribution to the achievements of sustainable development in the Gambia, the implementation of the action Plan of the Strategy is a priority of the Ministry of Environment, Water, Climate Change & Parks and Wildlife Management, which is phased in partnership with other institutions and bodies to ensure that its objectives are transformed into practical activities.

We know about the decline in biodiversity to start taking steps to reverse it, but are not fully aware of all its potential consequences for our species. We know very little about the impact of Climate change on biodiversity, for example Preservation of biodiversity, like the struggle

against climate change, requires radical changes in attitudes and lifestyles. This change in attitude and action is a matter of concern to each and every one of us. We will succeed by educating the new generations by ensuring information is disseminated to the wider public.

Biodiversity is an obvious asset for tourism; local and international value and significance, and functions as an all-embracing concept providing a common frame of reference to be managed according to an integrative strategy and plan of action. We must help all implementers keen to promote biodiversity to approach this concept in a spirit of sustainable development.

To reinforce the protection of our natural heritage and in keeping with our commitments under the Convention on Biological Diversity, the Gambia has designed and revised the National Biodiversity Strategy and Action Plan. This will provide a strong impetus for all our policies aimed at protection and conservation of our valuable biological resources.

Biodiversity provides numerous benefits to our people and to the economy, as a consequence needs to be conserved and managed to ensure that these benefits can continue, and managed in ensuring equitable benefits to people, both current and future generations.

To achieve this goal, the National Biodiversity and Action Plan highlight five strategic objectives, and a number of outcomes have been identified for each of these strategic objectives, with five year targets and indicators, as well as activities to achieve the outcomes, complete with priority, lead agency, support partners and the role of our Department of Parks and Wildlife Management and National Environment Agency.

In order to ensure conservation and sustainable use of biodiversity, we need to deal with the root causes of biodiversity loss. These often will need strong commitment at the highest levels of government, local communities and authority. The strategy has a strong focus on mainstreaming and integration, institutional effectiveness, cooperative governance and partnerships. The challenges are enormous, and our strategy needs to be implemented through prioritized set of actions to achieve measurable outcomes.

Conceived in a timely manner, the revised NBSAP therefore, provides a major contribution for planning reference in all biodiversity related programs and development projects to be carried out in the key production sectors by government departments, private investors and other stakeholders in the effort to promote growth that is sustainable.

Honorable Pa Ousman Jarju
Minister of Environment, Climate Change, Water and Wildlife

A NOTE FROM THE DIRECTOR

The National Biodiversity Strategy and Action Plan 2nd edition is the output of the valuable contributions from key national stakeholder experts in biodiversity protection. These included individuals and representatives from the Focal Institution for Biodiversity, relevant sector ministerial departments, local community groups, private sector, National and International Organizations and NGO's.

The revision process was carried out under the supervision of the Ministry of Environment, climate change, water and wildlife. To guarantee the technical orientation required in the NBSAP revision process and safeguard the cross sectoral character of biodiversity issues, a Biodiversity Inter-ministerial steering Committee was set up with representatives from relevant key stakeholder Ministries. The Inter-ministerial committee will be an effective mechanism for encouraging better linkages between sectoral programmes which will impact on biodiversity, therefore, the contributions of members of the Committee in reviewing and adopting the NBSAP project work plans and technical documents submitted were highly invaluable to the successful realization of this work.

The Inter-ministerial steering Committee worked closely with the Project Team set up to ensure an effective coordination of the NBSAP revision process. Better co-ordination between the different agencies responsible for managing the natural environment will create a genuine veritable force whose aim is to conserve and sustainably utilize our natural resource base, upon which we ultimately depend for our basic needs, survival and development.

The critical review and observations of the NBSAP document by the DPWM Directorate, national and international experts, was also highly useful in improving the quality of the document. Mr. Alpha Omar Jallow and Dr. Omar Sonko , were engaged as the consultants for the production of the final document, and engaged a team of experts with long standing experience and expertise in biodiversity conservation, management of specific ecosystems and thematic areas.

This work also benefited from a significant contribution of Civil Society Organization's under the coordination of TANGO. Realizing that, this work called for specific thematic studies carried out by a series of experts. Several reviewers dedicated valuable time in the review of draft documents and the proof reading of the document. These included experts from the SCBD, WCMC-UNEP, UNDP- CO, Dr Almamy Camara etc. The activities in the development of the revised NBSAP were carried out with the financial and technical support of the Global Environment Facility (GEF) and the United Nations Environment Program (UNEP).

Momodou L. Kassama

DPWM/Director

EXECUTIVE SUMMARY

The Gambia's biological resources are vital to the population's economic and social development. As a result, there is a growing recognition in the Gambia that, biological diversity is a global asset of tremendous value to present and future generations. At the same time, the threat to species and ecosystems has never been as great as it is today. Species extinction caused by human activities continues at an alarming rate. Recognizing the need to conserve its biological resources, the Government of the Gambia has made a commitment to conserve at least 5% of terrestrial and inland water, and 10% of coastal and marine areas through systems of protected areas. Although in-situ conservation must be the first priority, the protected area network alone will not be sufficient to secure all of Gambia's biodiversity for future generations.

Agenda 21 of the CBD called upon Parties to develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or to adapt, for this purpose, existing strategies, plans or programmes to reflect, inter alia, the measures set out in the Convention relevant to the Contracting Party concerned. It also urges Parties to integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

To fulfill one of the key obligations under Article 6 of the Convention, The Gambia has reviewed and updated its National Biodiversity Strategy and Action Plan (NBSAP). The revised NBSAP sets out a strategy for action for all sectors, local communities and authorities, Civil Society Organizations' (CSO's) and private sector entities'. The Action Plan recognizes that much of biodiversity loss in The Gambia, as elsewhere, is due to economic policy distortions and the resultant poverty that encourage rapid over exploitation of biological resources rather than sustainable use. It also recognizes that slowing down the rate of biodiversity loss will require policy and institutional reform as well as institutional strengthening for effective action in all the areas. The Plan highlights the need to strengthen national capacity and identified major gaps in our knowledge and understanding about biodiversity, brought into light the major threats facing biodiversity and proposed strategic actions on how to address them.

Furthermore, the revised NBSAP emphasizes the need for policy reform to support biodiversity conservation and sustainable use, institutional reform and strengthening to make new investment effective. Due emphasis is placed on the implementation of field based activities in the areas of research, ecotourism, forestry, wildlife, fisheries and water resources to consolidate and augment ongoing and proposed conservation projects in The Gambia.

Although the plan is directed to all strata of Gambian society (from decision makers to rural farmers) recognizing that conservation and sustainable use of biodiversity is the duty of every Gambian, the projects and programmes proposed are designed for local communities as important stakeholders whose livelihood depend on the conservation and sustainable use of biodiversity.

The updated action plan was prepared with the active participation of local communities from the herder, herbalist, trader and policy makers, through divisional and regional workshops and a national forum where the document is finalized. The key stakeholders for implementing The Gambia Biodiversity Strategy and Action plan includes the local communities and authorities, relevant government departments and agencies, Civil Society Organizations, the public sector and the donor community. The active participation and involvement of these key stakeholders and partners will ensure the success of the implementation of this striving national Action plan.
The Convention on Biological Diversity was inspired by the world community's growing commitment to sustainable development. It represents a dramatic step forward in the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources.

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[1] Sillah, J. (1999) *Action Plan on Forest and Wildlife Management, NAD-Gambia : Forest Resources and Plantations*. FAO
[2] Department of Forests, *op. cit.*

INTRODUCTION

The NBSAP is designed in compliance with the Strategic Plan of the CBD which is a flexible framework relevant to all biodiversity-related conventions. The CBD advocates for the Strategic Plan to be executed by all parties through national, regional and international activities. The CBD and several other Conventions (CITES, CMS, RAMSAR, Abidjan Convention, AEWA, Cartagena (Biosafety) and Nagoya (ABS) protocols) recognize the NBSAP as the tool for implementation not only of the CBD but the cluster of biodiversity related conventions, agreements and protocols. To ensure coherence and mutually supportive implementation of these conventions, the revised NBSAP adopted a highly participatory process through a targeted consultation with the National Focal Points of the biodiversity related conventions and the design of the priorities within this document. Specifically, the United Nations Convention for the Framework on Climate Change is translated nationally through the National Adaptation Action Plan (NAPA) and Nationally Appropriate Mitigation Actions (NAMA).

The NBSAP seeks to ensure coherence with the national priority actions for the RAMSAR Convention on Wetlands which provides the framework for international cooperation on the conservation and wise use of wetlands and their resources. The Convention on International Trade on Endangered Species (CITES) seeks to ensure that international trade in animal and plant species is sustainable and does not threaten their survival or contribute to the increasing rate of biodiversity loss. The Convention on the Conservation of Migratory Species of wild animals (CMS) aims to conserve terrestrial, aquatic and avian migratory species throughout their range. Based on guidance from the Secretariat of the CBD and CITES, specific attention has been given in the NBSAP revision process to ensure collaboration among the National Focal Points of these Conventions and to secure input from both CITES, Program of Works on Protected Areas (PoWPA), CMS, RAMSAR, Abidjan Convention, AEWA, Cartagena (Biosafety) and Nagoya (ABS) protocols on national priorities. As an outcome, the NBSAP recognizes illegal commercial trade in wildlife species and commercial trade in specific or limited plant species as a cause of pressure.

Several targets opt for conservation and sustainable use measures of these wildlife species. These include Target 2 and 12 which opt for increased knowledge on the value of species including wild species that can be valorized and marketed; Target 8 for species conservation; Target 17 promotes an innovative coordination platform of CITES, PoWPA, CMS, RAMSAR, Abidjan Convention, AEWA, Cartagena (Biosafety) and Nagoya (ABS) protocols National focal points.

A. NBSAP Revision Process

The Gambia ratified the United Nation Convention on Biological Diversity (UNCBD) in 1994. The country has therefore made commitment for the conservation of biological diversity, the sustainable use of its components and fair and equitable sharing of benefits arising from the utilization of genetic resources. To this end, the country has since established necessary legal, institutional and policy frameworks for the management and conservation of biodiversity. The Department of Parks and Wildlife Management (DPWM) is established as the government institution responsible for biodiversity conservation and sustainable use, under the Ministry of Environment. The Department since its establishment in 1977 has identified and set aside, areas rich in biological diversity as protected areas. Today, the department manages twenty two protected areas in different parts of the country as representative samples of the country's biological and natural resources. Biological diversity is the foundation of livelihood for every Gambian. Biodiversity is important for the economic and social development.

The current document is a revision and update of the 1999 National Biodiversity Strategy and Action Plan (NBSAP). It is the culmination of a process of public consultation and focus group discussions carried out from 2013-2015 of work countrywide. For many months national consultants worked in search of information on the current status of biodiversity in the Gambia, referring to work done, as well as the results obtained in most recent research conducted on terrestrial, marine and coastal biodiversity. It highlights the species, genetic and ecosystem trends and threats. In identifying the causes and consequences of the loss of biodiversity in this document, the new plan focuses on providing priorities to strengthen the current endeavors to bring about an accelerated development that is sustainable and minimizes the loss of biodiversity. For this purpose, the document sets strategic goals and targets for 2020 to be taken into consideration within ecosystems and key production sector intervention actions. The cross sectoral scope is critical for the successful implementation of the revised NBSAP. In ensuring compliance with national commitments to global conventions, the scope of the NBSAP goes beyond the CBD as it seeks to ensure synergy with the Rio Conventions, Convention on migratory species (CMS), Convention on International Trade on Endangered Species (CITES) and other biodiversity related Conventions. The present document provides an orientation for the subsequent development of a Capacity Development Plan; Communication, Education and Public Awareness Plan and a Resource Mobilization Plan for its implementation.

The methodology for the revision and updating of the 1999 NBSAP document, substantially draws from the guidance of the Conference of Parties (COP) of the Convention on Biological Diversity in Decision IX/8. In recognizing national biodiversity strategies and

action plans as key implementation tools of the Convention, the decision provides guidance to countries on the methodology for the revision of NBSAPs to:

- ✓ Include various stakeholders including amongst others indigenous and local communities
- ✓ Include relevant sectors that impact on and benefit from the use of biodiversity and its related ecosystem services;
- ✓ Develop flexible targets taking into account national priorities and capacities,
- ✓ Use revised NBSAPs for integration of biodiversity into national development planning processes and accounts, and
- ✓ Monitor NBSAPs using indicators.

In compliance with this guidance, the various phases in this process were respected as explained below:
The Department of Parks and Wildlife Management (DPWM) as the focal and coordinating Institution of the Convention on Biological Diversity(CBD) has the institutional mandate to lead the revision process. In collaboration with the CBD Focal Point, a Project coordination unit was set up, following a rigorous and successful recruitment process.

In view of the cross sectoral nature in dealing with biodiversity issues, an inter-sectoral group of experts designated by stakeholder institutions directly involved in the use and management of biodiversity, was also put in place. A steering committee was set up and charged with providing the technical guidance for the revision of the NBSAP. The steering Committee met twice a year to provide guidance and technical input for all studies carried out and documents developed within the process. The Permanent Secretary (Ministry of Environment) was selected as the chairman of this committee while the NBSAP Project Manager serves as the Secretary. The committee comprises of Ministry of Environment, Ministry of Finance and Economic Affairs, Ministry of Tourism, Ministry of Agriculture, Ministry of Justice, Ministry of Regional Administration Lands and Traditional Rulers, Ministry of Energy, Ministry of Works and Infrastructure, Ministry of Interior, Department of Parks and Wildlife Management, National Environment Agency.

Other government institutions and Civil Society Organizations included; Department of Fisheries, Department of Forestry, Department of Water Resources, Department of Livestock Services, Department of Community Development, Department of Agricultural Services, Department of Physical Planning, Department of Lands and Survey, Stay Green Foundation, West Africa Bird Study Association, Gunjur Environmental Protection and Development Group, Wildlife and Conservation Trust, Makasutu Wildlife Trust, National Agricultural Research Institute, University of the Gambia, Gambia Cashew Growers Association, Gambia Farmers

Platform, Gambia Beekeepers Association, Biodiversity Action Journalist, National Assembly Select Committee on Environment.

The process of carrying out country studies and stocktaking exercises for the revision of the 1999 NBSAP, involved several desk reviews and assessments in a highly public consultative and participatory manner involving key stakeholders at various levels countrywide. Several desk studies established the institutional map for biodiversity in the country, to assist in the identification of key stakeholders' roles and responsibilities. The NGO sector contributed immensely to these studies. Reports and findings from these studies carried out over a period of 5 months were subjected to review and validation by the designated experts' steering committee and the directorate of the Department of Parks and Wildlife Management. It is important to highlight that, the gap analysis substantially drawn from previous national initiatives, was carried out by selected consultants to address cross cutting issues in the various sectoral entities of government, Civil Society Organization's, local communities and authorities. Of importance was the final retreat of a team of experts from the DPWM and duo consultants at the Jenoi Agricultural Training Center to compile the zero draft of this document, through the pile of information made available during the sectoral, cross-sectoral and thematic areas studies.

B. Lessons Learnt

Technicians in Government institutions that have institutional memories and have been at the helm of the Government Departments responsible for Biodiversity conservation (Parks & Wildlife Management, Forestry, Livestock, Agriculture, Fisheries, Water Resources) and responsible for the implementation of the NBSAP have left the positions as Technical Directors and senior Technicians within the course of the NBSAP implementation phase. The second generation of staff had very little orientation, knowledge or understanding about the NBSAP framework. At the focal Department's level, the NBSAP was always used to develop projects in order to be able to implement the activities of the Action plan. The Integrated Coastal and Marine Projects (ICAM) 1 & 2, Program of Work on Protected Areas (PoWPA), Gambia Biodiversity Institutional Strengthening Project (GBMISP), were all designed to address the NBSAP issues. Monitoring and evaluation was not a component taken earnestly to ascertain compliance. For the revised NBSAP, all the issues that prevented the full implementation of the previous NBSAP have been analyzed objectively with the full participation of all stakeholders. This approach has enabled the acceptance and adoption of the concept of sectoral mainstreaming of issues of biodiversity and ecosystem services for human well-being into national and local plans, policies and programmes.

On successes, reference can be made to progress cited above. However, for obstacles, there have been a number of challenges and many of these take root from the basic misunderstanding of conservation and sustainable use of biodiversity.

Inadequate ability to use cost benefit analysis to make a case for biodiversity has often led to low national budgetary allocation and its relegation to a lesser important Department compared to Agriculture, Education or Health which is not in the best interest of biodiversity conservation. The subsequent recommendations can contribute to removal of these cited obstacles on lessons learnt:

- Need for Upgrading the Wildlife Sector into an Autonomous Entity.
- Reintroduction of Endangered, Rare and Threatened Wildlife Species like Lions, Leopards, Antelopes, etc
- Increased awareness and wide publicity on the revised NBSAP and its strategy.

In addition, The Gambia used to have these carnivores that support the ecological system but due to the impact of traditional hunting, bushfires, fragmentation among others lead to their extinction. This circumstance created a gap on food chain and some animal species overpopulated such as Western Baboons, Warthogs, Hippopotamus, Jackal etc. that are negatively impacting the food security.

Furthermore, re-introduction of these species will stabilize the ecosystem function, generate revenue for sustainable financing of Protected Areas and improve community livelihood.

C. Country Background

The Gambia is a small Sahelian country**,** bordered by Senegal and extending to the Western Coast of Africa between 13° and 14° N. It covers a total land area of approximately 10,689 sq. km with a length of about 400 km and a width varying from 20 to 48 km. According to the 2013 National population and Housing Census, The Gambia's population is estimated at 1.8 million people with a population growth rate 3.6% per annum (GBoS 2013). The Gambia is a Sudano-sahelian type of climate, with a short rainy season from June to October and a long dry season lasting from November to May. The average annual rainfall is 900 mm. There has been an average reduction of 27% in the annual average rainfall since 1951. The mean temperature is 25^{o}C. The Gambia has four major landscapes, namely; the flo*o*dplain, the colluvial slopes, the lower plateau and the upper plateau, with different soil types. The natural drainage is centered on the River Gambia and its tributaries, namely; Sand*o*ugou, Miniminyang, Baobolon, Sofaniama, and the Bintang Bolongs. The Ri**v**er Gambia, which Covers 1,130 km long, originates from the Fouta Djallon highlands in Guinea. With its characteristic Sudan Savanna woodland vegetation, The Gambia has the following main ecosystem types: forest ecosystems (close & open woodland ecosystem), agricultural ecosystems (arable and rangeland ecosystems), marine and coastal ecosystems, inland water ecosystems (wetlands) and terrestrial ecosystems (tree**/**shrub savanna).

The Gambia is endowed with a high diversity of plant and animal species. The components of biodiversity embrace the wild fauna and flora and associated ecosystems as well as the domestic species, including plant varieties and land races of domestic animals that have been bred and developed for thousands of years by farmers, as well as species that are dependent on the agricultural systems developed and maintained by humankind.

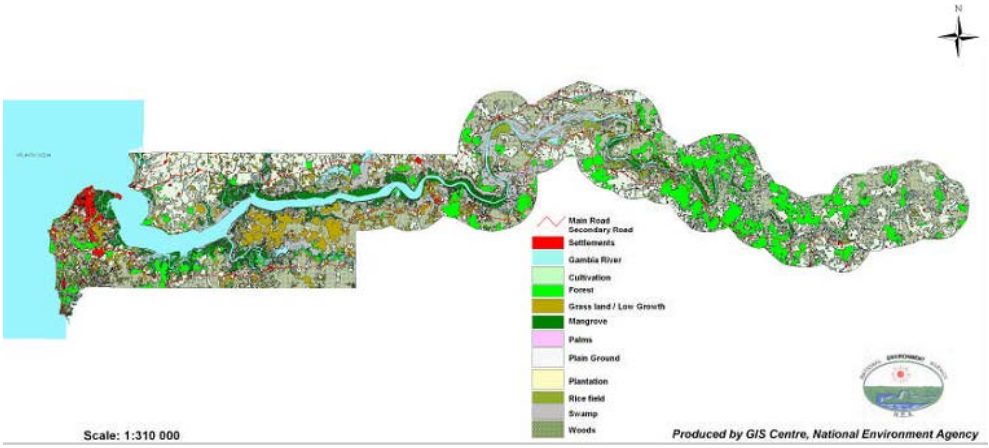


Fig 1 Land use map

Population

The population of The Gambia is 1,856,417 (50.8 percent females) in 2013, and the population density is 174 persons per Km^2 (up from 127 per Km^2 in 2003), thus making the country the 10^{th} most densely populated in Africa. Average life expectancy is relatively low at 58.8 years in 2012[i].The population growth rate increased from 2.7 percent per annum between 1993 and 2003, to 3.1 percent per annum between 2003 and 2013, indicating increased pressure on the country's land resources, and increasing the risk of land degradation.

The Gambian population is relatively young, with about 42.6 percent of the population being under 15 years of age, while 3.2 percent is 65 years and above, according to the 2013 census results. The 2013 census figures indicate an average household size of 8.4 persons at the national level. The Gambia is a multi-ethnic and a multi-racial society with an unparalleled degree of ethnic, racial, and religious tolerance.

Poverty

The Gambia is one of the poorest countries in Africa, and was ranked 171 out of a total of 187 nations in the world, and classified as a low human development country in terms of its Human Development Index (HDI). Between 1980 -2011, The Gambia has however improved upon all the dimensions of its HDI some of which were used to construct the multi-dimensional poverty index (MPI) for the Gambia. The HDI dimensions improved upon were: the average life expectancy of the Gambia; the mean years of education among the adult population 25 years

and over; the expected years of schooling for children of school-going age; health issues and the standard of living expressed in Gross National Income per capita.

The per capita gross national income (GNI) in 2013 was $1,557, well below the $3,152 average for Sub-Saharan Africa *(Human Development Report 2014, UNDP)*. Poverty declined from 58 per cent in 2003 to 36.7 per cent for the proportion of the population living below $1 per person per day and to 48.4 per cent for the population living below $1.25 per day *(The Gambia PAGE2012-2015 a quotation from the 2010 IHS report)*.

The poverty gap for the US$1 threshold was estimated at 21.8 per cent. This implies that 21.8 per cent of persons below this line are below the assumed level of equal distribution of income. The poverty gap for the US$1.25 threshold was estimated at 27.9 per cent.

The multi-dimensional poverty index (MPI) reported by the Human Development Report, 2014 based on 2005/2006 survey data was 0.320. This means that 32 percent of the population live below the poverty lines of US$1 or US$1.25 per person per day and they encountered some form of deprivation in education and health. These limited favourable improvements in these measures of poverty came as a result of government efforts in the fight against poverty in the country, dating back to 1994 when it launched the first strategy for poverty alleviation (SPA), also called the poverty reduction strategy paper (PRSP I). The Government's second Poverty Reduction Strategy Paper (PRSP) was initiated in 2007 as a follow-up to PRSP I and was focused on improving the welfare of all Gambians as well as eradicating poverty.

The Gambia PAGE 2012-2015, explains the limited impact of PRSP II implementation on overall poverty levels despite the significant progress registered in some pillars. The time frame for PAGE ends this year 2015 and the ongoing Integrated Household Survey (IHS) activities would provide the data needed for determining the most recent poverty indicators.

D. Importance of Biodiversity to national development and poverty eradication

The contribution of biodiversity to national development varies significantly but for the sake of this report, the focus is generally on community livelihood and poverty reduction;

Resource based activities and agriculture account for 30% of Gambian GDP. The fishing sector alone is estimated to employ 200,000 people in a country of only 1.88 million (Ba Nafaa 2009). 90% of the populations are agrarians depending on agriculture. Almost 85% use fuel wood energy. The ecosystem is rich and comprised of a good variety of fruit trees and shrubs which are consumed by both wildlife and human. Such species ranges from *Vitex doniana, Parinari excels, Parinari macrophylla, Detarium senegalensis, Detarium micrantum, Grewia bicolor* among many others. Fibre, fencing and roofing poles are an important part of our traditional life styles. Fibre is mainly extracted from species such as *Adansonia digitata, Grewia flavescence, and Ximenia americana* to name just few. Thatch grass for roofing is an important resource for the cross border population within North Bank Region.

Protected areas conservation includes providing alternative livelihood for communities. Such includes village banking for women, which is benefitting more than 800 women. Women groups dwelling in villages buffering protected areas benefits from horticulture support initiatives in 10 villages in Bao Bolong Wetland Reserve. Bee keeping is becoming prominent, engaging more than 200 men. Sustainable Land Management is a new paradigm for promoting soil fertility and productivity, therefore being popularized in communities' adjacent protected areas. Population of livestock are poorly managed, compelling protected areas to provide watering point and plant forage to reduce livestock mortality. This is partly done through control burning of the forest cover in the early part of the Harmattan season. This is important for reducing insects and pests.

However, apart from the provisions mentioned above, protected area/biodiversity conservation provides permanent jobs for youths. Such job includes community warden and rangers. 90% of employees under biodiversity regulatory agencies come from villages adjacent PAs. Temporal appointment such as boundary clearing, construction of structures and other are made available for PA communities.

CHAPTER ONE : BIODIVERSITY IN THE GAMBIA

1.1 Status of Ecosystem Biodiversity

1.1.1 Wildlife/Protected Areas

Currently there are 22 wildlife Protected Areas, occupying a total area of 76,064 hectares, approximately 6.4% of Gambia's total surface area. Only 0.16% of the terrestrial and inland water is protected while 7.4% of the marine and coastal areas are under formal protection with the goal being set to increase this area to 10% by 2015.

Eight of these Protected Areas are reserves and national parks while 14 are community based conservation areas under the mandate of the Department of Parks and Wildlife (DPWM). There are 66 forest reserves covering a total of 34,029 hectares managed by the Department of Forestry.

Thirty four forest parks totaling 22,239 hectares or 65% were designated as protected forest. Several local community forests also exist covering 18,000 hectares. However, most of these state and community forest reserves are exploited for firewood, timber and uncontrolled grazing though in principle meant to serve as biological pools to meet both local urban needs without compromising its environmental functions. Thus, they are not categorized as Protected Areas but few others such as bijilo, Pirang, Kungkilling and Dobo are undoubtedly managed for conservation.

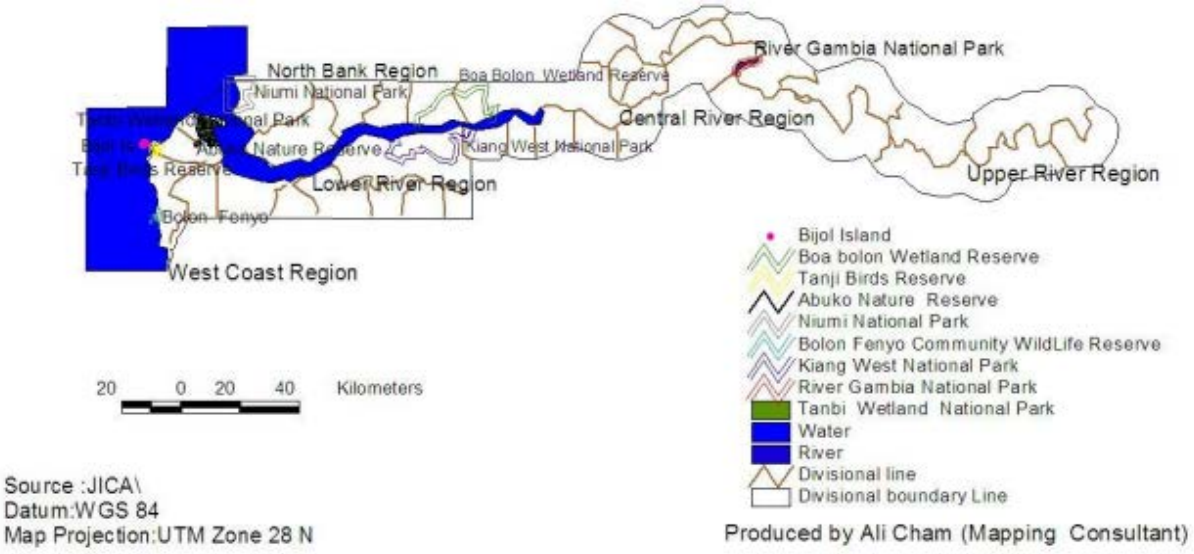


Fig 2: Map of the Gambia's Park and Wetland Reserves

A. In-Situ Conservation in Protected Areas

In-situ conservation measures in The Gambia have mainly included the establishment and management of protected areas (PAs). The Biodiversity/Wildlife Act, 2003 provides for the establishment of national parks and nature reserves. A total of twenty-two (22) protected areas have been established. A total land area of 76,064 hectares (i.e. about approximately 6.4% of the Gambia's land area) is under formal protection. Even if national parks and reserves can be

well protected and managed in-situ conservation outside national parks and reserves have no protection, staff nor budgets. Conservation areas represent only 6.4% of the nation's land surface. Where reserves become habitat islands and can lose some of their original species. Many wetland areas of high conservation value sustain high human use and therefore, require conservation action other than protected area status.

Table 1: Protected Areas of the Gambia

NAME OF PROTECTED AREA	DATE ESTABLISHED	TOTAL AREA (ha)	REMARK
Abuko Nature Reserve	1968	134	The first Protected area in the Gambia
Kiang West National Park	1987	19,051	This includes the Extension
Niumi National Park	1986	7,758	First transboundary RAMSAR Site in Africa (Niumi- Delta)
Boa Bolong Wetland Reserve	1993	22,000	Was designated a RAMSAR site in 1996
Tanji Bird Reserve	1993	612	
Tanbi Wetland National Park		6034	Declare a RAMSAR site December 2002
River Gambia National Park	1978	589	managed as a project
Jokadou National Park	In process of designation	15028	Proposed
Bolong Fenyo Community Wildlife Reserve	2007	320	The first community owned reserve
Bamako Community Conservation Area	In process	1032 ha	Process framework virtually completed
Barrow Kunda Community Conservation Area	In process	359 ha	Process framework virtually completed
Badari Community Conservation Area	In process	2ha	Process framework virtually completed
Demba Kunda Community Conservation Area	In process	7ha	Process framework virtually completed
Kass Wolof Community Conservation Area	In process	24ha	Process framework virtually completed
Chamen Community Conservation Area	In process	32has	Process framework virtually completed
Faraba Bantang Community Conservation Area	In process	502 ha	Process framework virtually completed
Pakau Njogu Community Conservation Area	In process	59ha	Process framework virtually completed
Kassagne Community Conservation Area	In process	132ha	Process framework virtually completed
Kanuma Community Conservation Area	In process	47ha	Process framework virtually completed
Tintiba and Dumbuto Community Conservation Area	In process	172.3ha	Process framework virtually completed
Berefet Community conservation Area	In process	984.9 ha	Process framework virtually completed
Bintang Community Conservation Area	In process	1184.9ha	Process framework virtually completed

For the effectiveness of in-situ conservation inside PAs, a trans-boundary RAMSAR site was established between Niumi National Park and Delta du Saloum National park in Senegal, a Biosphere Reserve (131,000 ha) is in the process of being established which will be upgraded to a trans boundary biosphere complex with Delta du Saloum Biosphere Reserve. This will promote peace, knowledge sharing, and livelihood improvement among others. The Department is undergoing a restructuring process to reduce the problems and causes of the heavily centralised system currently existing.

B. In-Situ Conservation outside Protected Areas

A significant portion of in-situ conservation in The Gambia takes place outside protected area system. Several natural forests, wild lands, wetlands, riverine, coastal and marine ecosystems, rangelands and agricultural landscapes support significant biological diversity. Most of these areas are located on public land and are subjected to various types of land use. There is no effective law enforcement that covers the conservation and sustainable use of biodiversity in these areas, although the Biodiversity/Wildlife Act 2003 is currently under review, which has catered for community and private ownership of Protected Areas.

Some of the existing conservation programmes outside protected areas are tree planting, community resource policing and Buffer Zone Management which are currently implemented only around Abuko Nature Reserve and Kiang West National Park. The Department intends to enrich the buffer zones with tree planting and remedial measures. There are no significant private initiatives yet, in establishing private conservation areas.

C. Ex-Situ Conservation

As a party to the CBD we are obliged to ensure increase in Protected Area coverage and in reference to the conservation of every gene, species and ecosystem in the Gambia. Beside the Abuko Nature Reserve Orphanage and the Chimpanzee Project at the River Gambia National Park which are ex-situ conservation areas under DPWM jurisdiction. There are many areas that exist under protection but they do not possess the legal status such as the Kafaya Sanctuary, Reptile Farm, Makasutu Cultural Forest, Brufut Woods, Marakisa, and Kartong Quarry among others.

Approximately 90% of the country's territory is not protected; these areas represent different ecosystem types ranging from coastal, marine, terrestrial and inland waters. However, most of these areas occupied by endangered wild fauna and flora includes, endangered and threatened species such as Hippopotamus, The West African Manatee, Sitatunga, Dolphins, Marine Turtles, and Migratory Water Birds etc. on the side of flora are mahogany, pterocarpus, chrysobalanus spp, schoenoplectus spp etc. These areas that are not protected are faced with many challenges such as deforestation, logging, siltation, erosion, decline in wild animal population, human-wildlife conflict etc. due to rapid human population increase.

1.1.2 FOREST BIODIVERSITY

The terrestrial surface of the Gambia in the past was covered by dense forest, estimated at 43% of the total land area of the country, National Forest Inventory (2010). Until now it is confirmed that the country lost over 13 species of mammals and an unknown number of floral species. Human population growth coupled with decline in annual average rainfall of 25-30%. , high consumption rate and technology used continue to be a major driving force for environmental and natural resource degradation. Results of the National Forest Assessment (NFA 2010) indicate that, regardless of the type, the great majority of the forest is Secondary Young (more than 50%), while smaller fractions of areas (around 30%, but more than 40% for Semi deciduous) is Secondary Mature. Primary forest constitutes about 11% of the area of Evergreen/gallery forests found in valleys and hydromorphic areas in smaller percentages of other forest types. The increased number of chainsaws and sawmills, and weak timber re-export policy coupled with ever increasing exploitation of the forest for firewood attributed significantly to forest biodiversity loss.

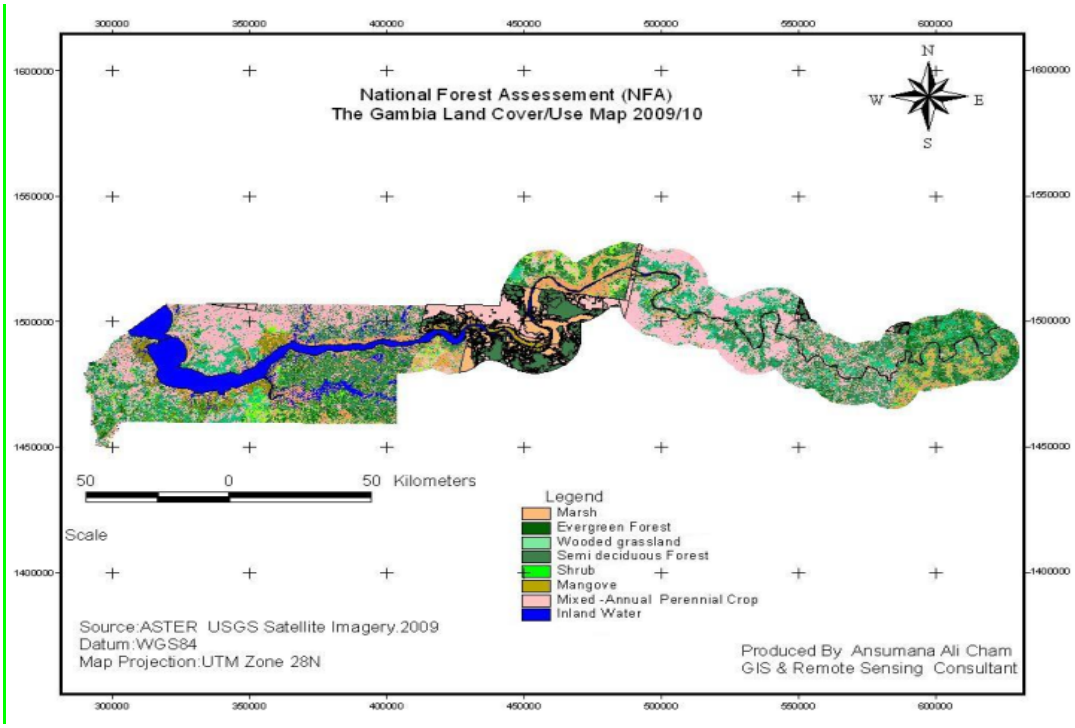


Fig 3: Vegetation Map of the Gambia

In the 1980s the Gambia Government embarked on a major process of transformation of its traditional forest management approach to a more sustainable and adaptable forest management system through a Technical Assistance Cooperation with the Federal Republic of Germany. A natural forest management model was piloted at Kafuta, West Coast Region (WCR) in BamaKuno and Katelenge forest parks (State owned gazzetted). A sawmill was also established and commissioned in 1985 at a time when most of the economically viable spp.(pterocarpus) were utilized as firewood causing economic and ecological losses to government and local communities.

After replicating this management model to three other forest parks in kiang West LRR, it was realized that the forest parks in the country represents only 7% of the forest cover. It was against this background that community forestry was introduced and piloted in the Fonis (Brefet,…) to have more areas under management with a view to control wildfires and illicit felling of trees and conversion of forest to other unsustainable land uses. From 2000 to 2007, twenty two forest parks in Central River Region (CRR), one in Upper River Region (URR) and another in Lower River Region (LRR) were under Joint Forest co-management agreements with partner villages and stakeholders. A major turning point during this time was the elaboration of the first comprehensive forest policy in 1995 which was oriented towards participatory forest management. According to 2010 NFA, 55,000ha are declared as forest reserves, 37,000 ha as forest parks and 18,000 ha community forests (Guenther, M & E report 2004 to 2006).

The land use areas have been obtained from a combination of two sources: the estimation of the classified ASTER images and the field survey. The Gambia has a total area of 1,130,000 hectares (SOER 2010). According to the National Forest Assessment (NFA) results,(2010) the forest area of The Gambia is composed of 26.6% Forest, 10.9% Other Wooded Land, 52.1% Other Land and 10.5% Inland Water as shown in table below.

Table: 2 Land Use Classes

Major Land Use	Area ('000 ha)	% of total area	Error % (se)
Forest	300	26.6	11.4
Other Wooded Land	123	10.9	18.2
Other Land	589	52.1	6.5
Inland Water	118	10.5	22.7

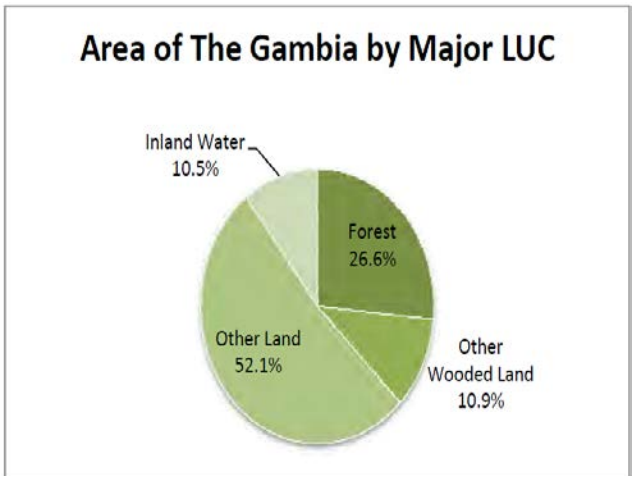


Fig. 4 Major Land Use Cover

1.1.3 WETLAND BIODIVERSITY

The coastal area of the Gambia is a suitable estuarine zone sheltering several mangrove hot spots. These habitats include DuaDula to Kartong Point, Allahein river mouth, Tanbi Wetland National Park, River Kakima Delta-Kachuma Forest, Solifor Point, Tanji Bird Reserve, Toll Point to Cape Creek and Tujereng Lagoons. Only these habitats: Tanbi Wetland National Park, Tanji Bird Reserve and Toll Point to Cape Creek are protected. Five protected areas: Bolong Fenyo Community Reserve, Niumi National Park, and Tanbi Wetlands National Park, Tanji bird Reserve (including Bijol Islands) are situated in the coastal and marine area. All of the six species of mangroves found in West Africa occur in The Gambia and have been recorded. These include *Avicenia africana*, *Conocarpus erectus*, *Laguncularia racemosa*, *Rhizophora harrisonii*, *Rhizophora mangle* and *Rhizophora racemosa*. Despite their ecological significance, the coastal and marine areas of The Gambia are threatened by both natural and anthropogenic factors. Natural threats include sea level rise and wave action. Anthropogenic threats are mainly the results of a large proportion of the population being concentrated in the coastal and marine areas. This has resulted in increased pressure on natural resources. Anthropogenic threats include uncontrolled sand/gravel mining, destructive mangrove cutting, random inappropriate methods of shrimp fishing and oyster harvesting, contamination of marine ecosystems by domestic and industrial waste and solid waste disposal.

Fig. 5 & 6: Local community planting mangrove in Niumi National Park

1.1.4 AGRICULTURAL BIODIVERSITY

Agriculture, being the backbone of the Gambian Economy, is the most important activity supported by Government and employs nearly 70% of the active population. The decline in crop yield such as groundnuts, cotton, sesame and others, constitute serious reduction in productivity. Some crops have had their diversity enhanced as a result of introduction of other varieties from outside the country such as NERICA. For livestock, some cattle breeds are on the decline. The West African short horn cattle which used to constitute about 80% of the national cattle population in the 1990s now constitutes about 47% of the national cattle herd. Poor soil fertility, habitat destruction/degradation, reduced rainfall, drought, disasters/flooding of agricultural fields, animal diseases, water and animal feed shortages etc are responsible for the decline in productivity and cattle population.

1.1.5 FISHERIES BIODIVERSITY

The Gambia has an 80 km long coastline and an Exclusive Economic Zone (EEZ) extending 200 nautical miles from the low water mark. Fisheries resources are provided from two sources, the river covering an area of 2,000 km^2 and the ocean covering the continental shelf to an area of 5,000 km^2. The estimated total biomass of demersals and pelagic fish resources in Gambian waters is as follows: Demersals 22,000 tons (Fridtjof Nansen, 1995) and pelagics 284,000 tons (Fridtjof Nansen, 2005), giving a total figure of 302,000 tons (Fridtjof Nansen, 1995, 2005). The total fish potential from the maritime fisheries is estimated at about 88,000 tons with pelagic and demersals fish resources constituting 78% and 22% respectively. Total annual fish production is 49,911.30 tons in 2010,(D0F 2011) clearly indicating a surplus potential. Information on the size of the river fish resources and annual fish landings from the river fisheries are not available. Certain fish species, such as the lobster (Palinurus spp), shark, catfish (Arius heudeloti) and the white grouper (Epinephelus aetheus) are threatened as a result of unsound human exploitation strategies. Based on the current production levels, there is considerable scope for exploiting the marine pelagic fisheries and developing aquaculture. In contrast, there is great need for tighter and more effective control of the threatened demersals resources. Wetlands, which include marine, coastal, inland waters, seasonal fresh water ponds/marshes are distributed country-wide.

1.1.6 COASTAL AND MARINE BIODIVERSITY

Conservation of biodiversity in Coastal and marine areas in the Gambia requires the protection and regulation of very large areas, and effective management to control pollution and shared resources. Management constraints are rather different to those for terrestrial systems. Resource users include a much broader community than those who live geographically close, and outsiders often have little or no incentives to protect the resource. Involving local communities in management of estuaries and other marine resources to control all users can be very effective since better protection brings an immediate incentive in increased fish harvests

A. Water Birds

More than one hundred and nineteen species of migratory water birds occur in the country. The first quarter of the year is an important moment for birding and monitoring of the abundance, distribution and occurrence in important wetlands around the country. The Sahelian Upwelling Marine eco-region is an important area for birds, including resident and migrant species, such as the lesser Black back Gull, Great Cormorant, Sanderlings, small plovers (e.g. Kittlizts, Ringed plover, Little Ringed plover, Kentish plover, and white fronted sand plover). Royal Tern, Caspian Tern, Audoin's gull, Grey headed Gull, Slender billed Gull, Kelp Gull, Osprey, Grey Plover, Ruddy Turnstone, Bar tailed Godwit, Black tailed Godwit, Bridled Tern, Reef Heron, Grey Heron, Great White Pelican. Wintering birds migrating from Europe and Asia use the area as staging post, nesting and feeding grounds. The Bijol islands known as the lone breeding ground of terns and gulls, is reducing in size due to sea level rise.


Fig 7 and 8: Bijols Islands Migratory Birds (Terns & Gulls) Nesting Colonies

B. Marine turtles

Marine turtles occur along the coastal stretches from Niumi up to Allahein River around Kartong further south on the border with Casamance. Five species were confirmed (Leatherback, Loggerhead, Green, Hawksbill, and Olive Ridley) to be nesting on the beaches and feeding offshore, and are classified as threatened because of coastal erosion, tourism and infrastructural development.

1.1.7 FRESH WATER BIODIVERSITY

The River Gambia constitutes the major inland water ecosystem in the country. It originates from the Futa Djallon highlands in Guinea and runs through a length of 1130km to the Atlantic Ocean. The country also has an extensive network of wetlands, and there are different classifications of the Gambia's wetlands. The most common fish species in the freshwater ecosystems of The Gambia are the riverine fish species mostly found in freshwater parts of the River Gambia, its tributaries and wetlands. These include catfish (Clarias spp), Osteoglossoids (particularly Heteroitis niloticus), Cichlids (Tilapia spp.) and Gymarchus (e.g. Gymnarchus niloticus). However, certain species such as the cynoglossidae and sharks etc cross the ecosystem boundaries.

1.2 STATUS OF SPECIES DIVERSITY

1.2.1. Terrestrial Species

Wildlife resources form an important component of the country's biotic assets from both ecological and economic viewpoints. According to the available data, there are 117 species of mammals, 47 species of reptiles and 30 species of amphibians making a total of 194 species of wild animals in The Gambia. However these figures are by and large estimates, the number could be higher than this if detail inventory is undertaken. The Gambia is also endowed with a rich avifauna estimated at a total of over 570 species and one bird species every 21.0 km2. It has no endemic and only 2 species - the puff-back shrike (Dryoscopus gambiensis) and the spur-winged Goose (Plectropterus gambiensis) bear its specific Epithet.

1.2.2. Freshwater Species

The River Gambia and inland water bodies such as flood plains and wetlands are considered to be rich in terms of species abundance and diversity of freshwater species. This is due to the fact that the productivity of the waters is enhanced by the high level of nutrients in the River and its tributaries. These waters are also habitats for a number of mammals such as hippos (*hippotamus amphibus)*, West African Manatee (*trichechus senegalensis)* and clawless otter *(anonys capensis)* and reptiles such as crocodiles. However, there is need for collection of specific statistical data and information on the status of the various fish and other aquatic species present in these freshwaters.

1.2.3. Marine Species

There is limited information available on marine species diversity in The Gambia reflecting somehow the situation at the global level. However, marine species whose diversity is threatened include marine mammals, sharks, Molluscs, shrimps and lobsters. And there is growing evidence that many of these marine species are becoming less abundant and less widely distributed, and therefore more vulnerable to extinction. It is pertinent to note that the protection and sustainable use of marine resources and biodiversity are governed by several international conventions, including the Convention on Biological Diversity (CBD). In this framework, sustainable use is defined as "the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations" (CBD, 2001).

1.3 STATUS OF FUNGI SPECIES

Although the biodiversity of fungi in The Gambia is not well studied, yet fungi (mushrooms and the microscopic fungi) constitute one of the most outstanding kingdoms comprising highly assorted and numerous species. Therefore for this and many other reasons, the inclusion of fungi in in-situ and ex-situ conservation and projects of environmental and biodiversity dimensions should be quite necessary.

A baseline needs to be developed to measure changes and abundance of fungal species at particular sites as relates to natural or artificial environmental derangements (*e.g.*, global warming, air, water, and soil pollution as well as forest fragmentation). It is quite necessary to consider and understand the diversity, the role in nature and the potential utility of fungi. However, due to the destruction of the ecosystem in many areas, numerous fungal species will perish and will be difficult to retrace, or will never be described.

Fungal biodiversity in The Gambia has numerous challenges. Of these, some occurred as a result of the injudicious exploitation of the agricultural systems. Subsequently, the biodiversity of fungi has unknowingly been deranged. Further, the reduction or loss of the fauna and flora also due to such malpractices has negatively impacted on the biological status of fungi in many ecologies of The Gambia.

1.5. CROSS-CUTTING ISSUES

A. Education

The Gambia Education Sector Strategic Plan (2006-2015), which is derived from the National Education Policy 2004-2015, has been a significant guiding document for the provision and management of education in general in The Gambia. The Strategic Plan spells out the basic and secondary education sector's priorities, goals, achievements and outlines the strategies and activities that should be implemented to achieve the overall objectives of the education sector. The plan also identifies indicators and tracking mechanisms for monitoring and evaluating the implementation of the six programme areas, namely: basic education, secondary education, quality assurance, higher education, technical vocational education and training (TVET) and sector management.

Before the establishment of Ministry of Higher Education, Research, Science, and Technology (MoHERST) in 2007, the National Education Policy 2004-2015 provided the framework for educational development in The Gambia, with a section on tertiary and higher education matters. With the creation of the Ministry of Higher Education, Research, Science, and Technology (MoHERST), tertiary and higher education has been defined in different ways based on the contextual environment of various educational systems. However, there are few public tertiary and higher education institutions in The Gambia, and only one public university (University of The Gambia) offers degree programmes. As a result, the country continues to grapple with the need for trained human resources at all levels and in all sectors, including the Agriculture and Natural Resource (ANR) sector. Furthermore, it is essential to harness public-private partnerships, while ensuring that the much needed human resource base is built.

B. Health and Biodiversity

Geographic problems such as desertification and soil erosion negatively impact biodiversity, and thus food sufficiency and household food security, which is a major cause of malnutrition among children and women. In addition, coastal erosion is detrimental to tourism, and the economic status, and abilities of women and others (especially those directly employed in the tourism sector- in hotels, restaurants and in the craft markets) to provide for their families.

Malnutrition and illness of mothers due to food insecurity can lead to physiological and cognitive underdevelopment of the fetus, which is later manifested in deaths, illnesses or permanent physical and mental disabilities among children. Babies are also affected by the immediate physical and physiological conditions of their mothers, in particular their capacity and willingness to breast feed. After few months, the child is susceptible to various environmental factors and diseases. In short, the impact of desertification and land degradation on health mainly revolves around increased:

- threats of malnutrition from reduced food and water supplies

- water- and food-borne diseases that result from poor hygiene, and lack of clean water
- respiratory diseases caused by atmospheric dust from wind erosion and other air pollutants

In addition, biodiversity loss often results in migration, and the attendant spread of infectious diseases.

For most communities, the first point of contact in seeking care for patients is the traditional system of care and this can be exploited for the benefit of the health of the community. As the communities believe in and use the traditional system of care, there is need to establish partnership with traditional healers. Some of the traditional methods of care have proven to be effective and need to be promoted, while others may be potentially harmful and may require further research

The traditional Healing System is a community based, self sustaining health care service and therefore can complement the public health service. Traditional Healers such as Herbalists, Birth Attendants, Spiritualists, Diviners and Bone Setters have their own support systems and infrastructure already in place. Their system of charging for their services is community friendly.

There is a growing tendency to move long term care from hospitals to home based (or community based) care. This is especially so with regard to TB, HIV/AIDS and psychiatric patients.

There would be benefits if Traditional Healers were adequately sensitized and utilized to complement the Village Health Services.

January 17th has been declared as traditional medicine day in The Gambia. Also, Traditional medicine (TM)/traditional knowledge(TK) has now been recognized as part of the public health care delivery system, but practitioners will come under regulation/scrutiny for safety of their concoctions/herbs!

Three key objectives as stated below were identified for interating traditional medicine into the formal health sector

1. To utilise traditional health practices effectively in the formal health care system
2. Sensitise Traditional Healers to provide home based care for long term care patients
3. Sensitise Traditional Healers to support community based health initiatives such as the Impregnated Bed Net strategy

In order to meet the above mentioned objectives, the following strategies have been put in place:

1. Integrate traditional health practitioner into the formal health care system.
2. Patenting and trade marking traditional knowledge and medicines.
3. Promote operational research in traditional medicine

C. Gender and Biodiversity

Gambian women constitute 78 percent of the economically active population working in agriculture, compared to just 57 percent of men. The majorities of Gambian farmers are unskilled agrarian wage earners and are responsible for about 40 percent of the total agricultural production in the country. The massive contribution of women to agriculture does not translate to their improved social status, while their productive activities are mainly subsistence-based, and for home consumption. Women are generally involved in food and horticultural production. Women farmers raise and manage most of the small ruminants, as well as poultry. Women are also engaged in fisheries as fish off-loaders and fish processors. In forestry, women are engaged in planting seedlings and woodlots.

Despite the critical role they play in agricultural production, women lack access to, as well as control and ownership of productive resources (farm inputs, implements, land and capital) resulting in low production and quality of rice (the staple food) and other crops. This affects food self-sufficiency and food security, and constrains the ability of women to move from subsistence to commercial farming to maximize their income. Furthermore, women lose up to 50 percent of their agricultural production because of lack of access to markets, and proper communication, storage, and transportation facilities. This reduced productivity and income of women increases their health risks, and reduces their ability to engage in other productive ventures. Girls' education is also reduced because in the Gambia, a girl child may be required to support their mothers in their domestic chores.

There is increased recognition of the value of indigenous knowledge, as well as women's and men's roles as innovators regarding biodiversity conservation and farming techniques. Experience has shown the need to build on such knowledge and to ensure the participation of local women and men (as innovators and end users) in order to improve tools and techniques aimed at combating desertification. Therefore, involving rural communities, especially the "voiceless," in biodiversity conservation, resource management and in decisions regarding environmentally sound practices and techniques aimed at combating desertification (such as rainwater harvesting, insect control, post-harvest storage, etc.) is a powerful way to mitigate the conditions and the impact of land degradation.

Gender mainstreaming in biodiversity planning is intended to bring the diverse roles,
needs and knowledge of women and men to bear on national strategies to reverse the loss and unsustainable use of biodiversity. Gender mainstreaming is "the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetuated. As with "biodiversity mainstreaming" into national development, gender planning and sectoral planning, gender mainstreaming has to be a two-way process. It is not only about integrating gender into

biodiversity planning, it is also about integrating biodiversity into national policies and programmes.

Biodiversity is important as it is relevant for the socio economic development, and women's role as primary land resource managers is crucial for the attainment of the set targets in the NBSAP. For example women account for 60-80% of all production in the Gambia. According to the 2003 census Data 45% of the 482,439 economically active populations are women occupying 61.9%of the unskilled labour force and 16.45% in the fishing sector. They also form almost 90% of the oyster and cockle harvesting and production but lack the appropriate skills and techniques to properly process, package and market their products.

Women constitute 70% of the world's poor. They are often responsible for household food and energy production, family nutrition and health, the management of natural resources, and the maintenance of biodiversity. However women are very often disadvantaged in employment, wages, resource ownership, access to credit, education, health, sanitation, and other government services

Women are also a huge untapped, or underutilized, asset in the conservation and sustainable use of biodiversity. Not only do they compose roughly 50% of the population, they are also parents, educators, healers, farmers, leaders, innovators, and organizers, and as such can be extremely useful in advancing the cause of biodiversity.
The formulation of the National Gender and Women Empowerment Policy 2010- 2020 encourages community women participation in the management and accessibility to environmental resources as well as agro- forestry for land conversation. The framework incorporates the interest of other stake holders to reduce or avoid conflict. This represents a shift in the environmental management as a result of the introduction of environment management strategies that recognizes the role of women in sustainable management of the natural resources which is crucial for reduction on biodiversity loss.

Destructive and unsustainable fishing methods and practices using trawlers and other fishing gears such as nets. Harvesting of mangroves for fuel wood supply, domestic use among others. Population pressures in urban cities due to the expansion on the various sectors of the economy as well as climate change. Deforestation making the land vulnerable to all forces of degradation especially soil erosion.

Increased representation of women in natural resources and water management decision making bodies at all levels is very vital. Availability of adequate and current information on the environment and its resources; thus, improved farming and fishing methods which is critical for production, preservation as well as reduction in biodiversity loss. Reduction in work load as a result of less labour intensive technologies for horticulture farming.

The advocacy activities over the years to ensure equal participation in the management, access to environmental resources including portable water and disaster management and prevention has contributed to the attainment of targets set for the proportion of the population using improved drinking water as outlined in Millennium Development Goal 7 (MDG7).

Sharing of information on climate change is essential for farming methods and practices and this contributes to reduction in biodiversity loss. Wildlife protected areas is crucial for maintaining wild animals in the Gambia. Constant collaboration with stakeholders is critical towards the attainment of results. Timely availability of funds is critical for the implementations of activities. In order to reduce biodiversity loss the Women's Bureau, The Gambia plan to lobby for land reform pertaining to ownership and maintenance, encourage agro- forestry activities as well as developing and promoting the use of alternative energy and other technologies. This will contribute to soil fertility maintenance as well as help communities to effectively manage, preserve and protect the environment.

In 2002 the Hague Ministerial Declaration stated that the most important lesson of the previous ten years was that the objectives of the Convention would be impossible to meet until consideration of biodiversity is fully integrated into other sectors. "Mainstreaming" means just that: the integration of the conservation and sustainable use of biodiversity in both cross-sectoral plans such as sustainable development, poverty reduction, climate change adaptation/mitigation, trade and international cooperation, and in sector-specific plans such as agriculture, fisheries, forestry, mining, energy, tourism, transport and others. It implies changes in development models, strategies and paradigms. Mainstreaming is not about creating parallel and artificial processes.

D. Information, Education, and Communication

The information and communications industries (ICT) sector has seen remarkable growth during past decade because of various policies and programs, and private sector investments. Among the key government initiatives are the National Information and Communications Infrastructure (NICI) policy, the ICT for Development (ICT4D) Action Plan, and the Telecommunications Act. In addition, government liberalized the ICT sector, thereby increasing the number of radio stations, Internet Service Providers (ISPs), as well as mobile phone operators. Recently, a public-private partnership (PPP) venture was launched to operate the country's first direct fiber optic gateway via the Africa Coast to Europe (ACE) fiber optic cable project.

The private sector, on the other hand, has made massive investments in ICT development, and this, coupled with increased competition, has reduced prices for mobile phone services, improved quality of services, and increased the variety of services available. In addition, mobile phone penetration increased dramatically from 17.23 percent in 2005 to 99.98 percent in 2013.[ii] Similarly, Internet access increased 15-fold from 0.92 per 100 individuals in 2000, to 14.0 individuals per 100 in 2013.[iii] There also has been an increase in the number of FM radio stations in the country, although only one television station, owned by the national broadcaster, operates in the country. Traditional communication channels such as drama and sing groups called *Kanyelengs* are also important channels of communication in many, especially rural parts of the country. Against this background, there are many channels for the dissemination of information, and to educate farmers and the public at large about biodiversity and other related issues.

CHAPTER TWO: THE VALUES, CHALLENGES, GAPS AND OPPORTUNITIES OF BIODIVERSITY

The values

Biological diversity or biodiversity is defined as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (Article 2 Convention on Biological Diversity). Biodiversity as the composition of plants, animals and micro-organisms life on earth with their diversity in species, genes including ecosystems offer great opportunities for human wellbeing and development. Goods or natural resources provided by a diversity of species significantly contribute to food security and health essential for local livelihoods and largely underpin development of key production sectors.

In addition, genetic diversity increases species resilience and adaptability to changing environmental conditions with opportunities for food security, medicine and development of industry while ecosystems in which biodiversity constantly interacts, offer provisioning services of carbon sequestration, plant pollination, watershed protection, enrichment and maintenance of soil fertility, breakdown of waste and pollutants which are essential for human survival. The Gambia is endowed with a rich heritage of biodiversity and biological resources. The coastal and marine ecosystem, and more importantly the riverine ecosystem harbor a highly diversified flora and fauna and support considerable agricultural, forestry and fishing activities. In rural production for food and nutrition about 80% of the rural populations are engaged in biodiversity-driven activities on which their livelihoods depend. The medicinal properties of diverse plant and animal species provide enormous health benefits. It is estimated that 80% of the rural population in The Gambia depend on traditional medicine and biodiversity for livelihood.

The nation's biological diversity underpins its economy significantly contributing to the wellbeing of its people and particularly the rural population.

The Gambia has one of the smallest economies in West Africa, with limited natural resources. The economy is dominated by the service sector (which accounts for 57.3 percent of Gross Domestic Product [GDP]), and the agricultural sector (26.9 percent of GDP in 2010). Industry and services sectors contribute 13.7 percent and 53.6 percent of GDP, respectively, to the GDP. Tourism and banking have also registered significant growth in the past few years in the country. Agriculture in the early 2000s accounted for around 32.7 percent of the GDP, and employed around 75 percent of the active labor force. Although agriculture has been dominated by the production of groundnuts as a cash crop, for the past 43 years, this is now changing with increased adoption of cashew and sesame.

The individual components of biodiversity—genes, species, and ecosystems—provide with a wide array of goods and services. Genes, species, and ecosystems of direct, indirect, or potential use to humanity are often referred to as "biological resources" (McNeely and others 1990; Reid and Miller 1989; Wood 1997). Examples that we use directly include the genes that plant breeders use to develop new crop varieties; the species that we use for various foods, medicines, and industrial products; and the ecosystems that provide services, such as water purification and flood control. The components of biodiversity are interconnected.

Biodiversity contributes to our knowledge in ways that are both informative and transformative. Knowledge about the components of biodiversity is valuable in stimulating technological innovation and in learning about human biology and ecology. Experiencing and increasing our knowledge about biodiversity transform our values and beliefs. In addition, such services in biophysical and economic terms characterize the institutional mechanisms needed to generate incentives.

Some aspects of biodiversity are valued directly; while others are valued for their contributions to ecosystem support and, hence, to sustainable production of things that are valued directly. The economic value of biodiversity has its place in the policy-making process. Although biodiversity might well have substantial economic value, compared with alternative consumptive resource uses, economic value does not tell us everything we need to know about the value of biodiversity.

Challenges , Gaps and Opportunities

Wildlife conservation requires ensuring maintenance and management of floral and faunal species within the ecosystems, that's water and landscape they inhabit. The gaps and weakness in biodiversity conservation varies ranging from insufficient financing, human resources, intellectual capacity, demotivating staff remuneration, insufficient park facilities and infrastructure and non-decentralised system. Meanwhile, DPWM has endeavoured to improve the status quo by establishing Biodiversity Trust Fund (BTF) for sustainable financing, promoting private sector involvement such as Eagle Height Project, training of personnel at all levels, PA infrastructural development, plans initiated for restructuring DPWM into an Authority to address staff demotivation, remuneration and system decentralization among other activities.

However, the following strategies are designed to address the above mentioned gaps and weakness

1. To upgrade Wildlife Sector to a semi-autonomous entity that can ensure proper PA Financing and sustainability.
2. To establish a training centre for capacity building of staff with the affiliation to University of The Gambia, in addition to advanced training overseas as well as to recruit well qualify personnel

3. To ensure increase in staff number and remuneration to enhance motivation and productivity
4. To construct and manage the necessary infrastructure and facilities to enable smooth running of protected areas
5. To consolidate decentralised of PA system in all the regions of the Gambia
6. To promote diverse governance regime of Protected Areas through Community parks and private protected areas in a bid to increase ecosystem- approach representative coverage.
7. To promote community livelihood and development needs, consequently reducing poverty and pressure on biodiversity use.
8. Review the status of forest parks currently managed for conservation purpose (bijilo, pirang, dobo and kungkilling forest parks) for possible collaboration.

CHAPTER THREE: LEGAL AND INSTITUTIONAL FRAMEWORK, CONVENTIONS, PROTOCOLS AND AGREEMENTS

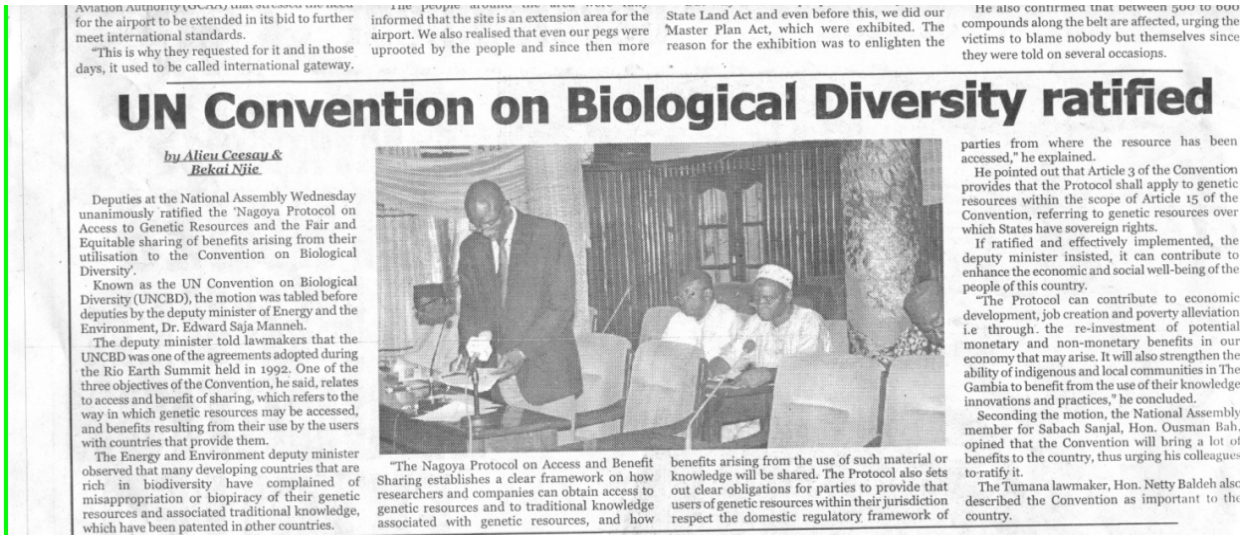
The Gambia is also a signatory and a Party to various regional and international treaties and agreements which are related to or affect biodiversity. The international conventions include; the Convention on Biological Diversity (CBD), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention on Wetlands of International Importance.Especially as Water Fowl Habitat (RAMSAR), Convention Covering the Protection of the World Cultural and Natural Heritage, United Nations Convention on the Law of the Sea, United Nations Convention to Combat Desertification(UNCCD), United Nations Framework Convention on Climate Change (UNCCC), Vienna Convention for the Protection of the Ozone Layer, Montreal Protocol on Substances that Deplete the Ozone Layer, London Amendments to the Montreal Protocol on Substances that deplete the Ozone Layer, Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal and the Treaty Banning Nuclear Weapon tests in the Atmosphere in Outer Space and under Water.

The regional agreements to which The Gambia is a Party include; the Convention on the African Migratory Locust; Convention for Cooperation in tile Protection and Development of the Marine and Coastal Environment of the West and Central African Region (WACAF); Protocol Concerning Cooperation in Combating Marine Pollution in cases of Emergency in West and Central African Region (WACAF); Bamako Convention on the Ban of the Import into Africa

Biotechnology is broadly defined as the integrated application of biological sciences such as genetics, molecular biology, microbiology and engineering to produce goods and/or services from living organisms or parts thereof. As a further practical demonstration of its commitment to issues surrounding biodiversity and the environment in general, the Government of the Gambia signed the Convention on Biological Diversity (CBD) on the 12th June 1992 and ratified it on the 10th June 1994. The Gambia signed the Cartagena Protocol on Biosafety on the 10th April 2002 and ratified the Protocol on the 2nd July 2003. In fulfillment of the obligation of CBD parties under Article 6 of the Convention. In 2006, the Gambia prepared a draft bill on Safety in Biotechnology and this bill was submitted to Cabinet and Parliament for endorsement and adoption.

Priority actions would be to develop and implement effective measures for management and control of activities relating to Genetically Modified Organisms (GMO's) in order to manage their impact on the environment. The deployment of genetically modified organisms into the environment has been increasing in the West Africa Sub region over the past five years of which the Gambia is no exception.

While it is believed that the future application of biotechnology may contribute to the mitigation of the environment impacts of agriculture, there is an urgent need for a comprehensive management framework for GMO's that would address impacts on the environment. This management framework includes the environment risk assessment for GMO's together with a risk management component that includes long term monitoring of GMO's released into environment and their impacts on biodiversity.



Aviation Authority (GCAA) that stressed the need for the airport to be extended in its bid to further meet international standards.

"This is why they requested for it and in those days, it used to be called international gateway.

The people around the area were informed that the site is an extension area for the airport. We also realised that even our pegs were uprooted by the people and since then more

State Land Act and even before this, we did our Master Plan Act, which were exhibited. The reason for the exhibition was to enlighten the

He also confirmed that between 500 to 600 compounds along the belt are affected, urging the victims to blame nobody but themselves since they were told on several occasions.

UN Convention on Biological Diversity ratified

by Alieu Ceesay & Bekai Njie

Deputies at the National Assembly Wednesday unanimously ratified the 'Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable sharing of benefits arising from their utilisation to the Convention on Biological Diversity'.

Known as the UN Convention on Biological Diversity (UNCBD), the motion was tabled before deputies by the deputy minister of Energy and the Environment, Dr. Edward Saja Manneh.

The deputy minister told lawmakers that the UNCBD was one of the agreements adopted during the Rio Earth Summit held in 1992. One of the three objectives of the Convention, he said, relates to access and benefit of sharing, which refers to the way in which genetic resources may be accessed, and benefits resulting from their use by the users with countries that provide them.

The Energy and Environment deputy minister observed that many developing countries that are rich in biodiversity have complained of misappropriation or biopiracy of their genetic resources and associated traditional knowledge, which have been patented in other countries.

"The Nagoya Protocol on Access and Benefit Sharing establishes a clear framework on how researchers and companies can obtain access to genetic resources and to traditional knowledge associated with genetic resources, and how benefits arising from the use of such material or knowledge will be shared. The Protocol also sets out clear obligations for parties to provide that users of genetic resources within their jurisdiction respect the domestic regulatory framework of parties from where the resource has been accessed," he explained.

He pointed out that Article 3 of the Convention provides that the Protocol shall apply to genetic resources within the scope of Article 15 of the Convention, referring to genetic resources over which States have sovereign rights.

If ratified and effectively implemented, the deputy minister insisted, it can contribute to enhance the economic and social well-being of the people of this country.

"The Protocol can contribute to economic development, job creation and poverty alleviation i.e through the re-investment of potential monetary and non-monetary benefits in our economy that may arise. It will also strengthen the ability of indigenous and local communities in The Gambia to benefit from the use of their knowledge innovations and practices," he concluded.

Seconding the motion, the National Assembly member for Sabach Sanjal, Hon. Ousman Bah, opined that the Convention will bring a lot of benefits to the country, thus urging his colleagues to ratify it.

The Tumana lawmaker, Hon. Netty Baldeh also described the Convention as important to the country.

Fig 9.Nagoya Protocol Ratification session at the National Assembly

SYNERGIES

The Revised NBSAP is not a separate document. Therefore for an effective implementation of the plan, it has been designed to be in synergy with other national plans, laws and programmes that directly have implication on biodiversity conservation, sustainable use and benefit sharing, as well as taking into consideration the MEAs and other international agreements of which Gambia is party.

3.1 LEGAL FRAMEWORK

The Gambia's environmental policy measures are supported by various biodiversity-related sectoral laws; for example, the National Environment Management Act (NEMA) 1994 ensures the integration of environmental considerations in all development strategies and related activities. The Biodiversity and Wildlife Act 2003 under the purview of the Department of Parks and Wildlife Management is currently being revised to further enhance the implementation of the NBSAP, other conventions and protocols. The Forest Act, 1998 and Regulations involve the communities in forest management. The NBSAP is being implemented in collaboration with other natural resource sectors (Agriculture, Forestry, Fisheries, Livestock, Water Resources and the National Environment Agency among others).

The Fisheries Act 2007 and its attendant Regulations (2008) have provisions covering efficient management of the artisanal and industrial fisheries as well as the development of aquaculture;. Together, these different stakeholders interact to address the issue(s) at the level of Agriculture and Natural Resources working group (ANRWG). In this regard, and to address conflicts and inter sectoral policy inconsistencies the Agriculture and Natural Resources Working Group serves as the clearing house mechanism and a policy conflict resolution forum.

The level of addressing biodiversity in national blueprints and report differs;

The National Adaptation Plan of Action (NAPA) of November 2007 has capture wildlife and natural resources as a main theme of which issues such as Agriculture, Fisheries, energy, Water Resources, Forest resources; Health and Rangeland have been discussed.

Programme for Accelerated Growth & Employment (PAGE) 2012-2015 has a theme on Environment, Disaster Risk Reduction, and Climate Change under which topics such as improved management of the other shared Resources has been explained. The programme aims to improve livelihoods and food security, and reduce poverty of population that depend on the Gambia's other shared natural resources (including rangeland, forests, fisheries, and wildlife) through sustainable management and land use of these resources.

Nationally Appropriate Mitigation Actions (NAMA) focuses on natural resources and environment sector with a brief history on wildlife conservation in The Gambia late back in 1977.

Gambia National Agricultural Investment Plan (GNAIP) and the Gambia Agricultural Sustainable Investment Framework (GAMSIF) has addressed the issue regarding the importance of conservation and use of wildlife resource base to ensure biological diversity of species, gene and ecosystem, and to tap the potential of the sub-sector for the socio-economic development of the country was explained as a national priority.

Gambia Environmental Action Plan (GEAP) phase I from 1992 to 2001 adopted in 1992 was of pivotal importance in its commitment to qualify human life and restore, maintain, and enhance ecological processes, natural resources and cultural and natural heritage. This report deals with environment as a whole which components of biodiversity are captured.

State of the Environment Report (SoER) February 2010 has a theme on Biodiversity that deals with topics such as; non sustainable utilization of Natural Resources, change in vegetation or Habitat cover, loss of plant/ Animals Biodiversity and other forms of biodiversity are well captured.

However efforts are underway to adequately mainstream biodiversity issues in all the sectoral and cross-sectoral policies such as National Adaptation Plan on Desertification (NAP), PAGE, UNDAF. This is being addressed through adequate consultation with all government and non-government institutions working in biodiversity, climate change, poverty reduction and land degradation.

3.2 INSTITUTIONAL MANDATES & CAPACITY

The conservation and management of biodiversity in The Gambia currently cuts across various Sectoral Departments, including the Department of Parks and Wildlife Management, Forestry, Fisheries, Agriculture, National Environment Agency and others. The key ANR sectors were established by Government to regulate the use of the natural resources and ensure their effective management. There is also a need to adjust the mandates of institutions and agencies of the natural resource sector, which are the main actors in conservation of biodiversity in accordance with their capabilities

3.2.1 Department of Parks and Wildlife Management (DPWM)

The Department of Parks & Wildlife Management has jurisdiction over wildlife in or outside wildlife protected areas and employ personnel/officers to carry out its mandate all over the country. The DPWM is the only government agency responsible for the protection and the management of the nation's wildlife resources. Wildlife being a national asset , Departmental staff are likewise deployed in all regions of the country. The Department has operational links with other Government Departments, Units and NGOs in both the natural resources and agricultural sectors. With reference to the aforesaid, the country is a fully fledged partner of the Reseau des Aires Marines Protégées d'Afrique De L'Ouest (RAMPAO) with four registered and active Marine Protected Areas (MPA's) members. This is a sub regional network of MPA's established to assist in the improvement of the day-to-day management of the Marine Parks and Reserves. The staff complement of the DPWM is 92 agents i.e. two (2) Senior professional staff, twenty (20) sub-professional staff and seventy (70) "amateurs". In addition to the 92 permanent staff, the Department is employing 58 temporary staff to assist in the day to day management of the different National Parks and Reserves under the authority of DPWM. The distribution of the staff between the parks is as follows:

Table 3: DPWM Staff Distribution

PARKS	PERMANENT	TEMPORARY
Abuko-Headquarters	50	8
Bao Bolon Wetland Reserve	18	3
Kiang West National Park	26	2

Tanji Bird Reserve	14	1
Niumi National Park	18	1
Tanbi National Park	13	1
River Gambia National Park	**7**	1
TOTAL	**146**	**17**

Presently, more than twenty-five (25) field staff has acquired certificate level in MWEKA (Tanzania), at the South African Wildlife College (SAWC) in South Africa and at Kafuta forestry school in the Gambia. At the Middle and senior management level, five staff are recorded as diploma holders in Natural resources management, out of which two are currently pursuing a Bachelor Degree in Environmental Science. Two others that hold Masters Degrees on Protected Area Management and are at the helm of the Department, it is obvious that the Department's workforce is seriously limited.

In addition, there are numerous capacity building initiatives (short term, on the job-training, workshop and seminars) organized periodically by projects of the department. National focal points of various conventions and protocols do also benefit from numerous capacity building programs organized in the sub region by PRCM, RAMPAO, WWF-WAMPO, IUCN, Wetlands International, and internationally by various conventions and protocol that the Gambia is party to (CBD, UNFCCC, UNCDD, FAO, UNDP…). Compared to the previous situation during the conception commencement of the first NBSAP implementation process, the DPWM has immensely/ tremendously increased capacity status of its staff members. This is an obvious fact, but still there are gaps and some opportunities to improve the situation at hand, that are presented in the proposed projects of the department.

The proposed DPWM reform being presently implemented by the GBMISP under the guidance of the World Bank will surely addressed key issues of efficiency and continuously build on the technical, financial and morale capacity of the employees.

3.2.2 Department of Community Development

The Department of Community Development (DCD) in particular has the mandate of building local institutional capacities to enhance sustainable development. These community based institutions have varied capacities but overall, they lack the requisite knowledge and skills required for them to become effective and fully execute their mandates.

Historically, the DCD was formally established by the Government of The Gambia in 1976 which integrated the then WFD (a German Community Development service- NGO) and the Community Development Service Unit under the then Ministry of Local Government and Lands

and reserves. The Department still has a unique role to play in furthering the cause of community and rural development in the Gambia. Despite the existence of other technical Government departments, the DCD continues to position itself as the central facilitator in the national quest to improve the conditions of rural people by:

- Ensuring that development is people focused with the maximum use of the limited available human resources through self help
- Building human and institutional capacity at local and community level,
- Fostering the creative participation of communities and groups in their own development, from identification of their needs to the implementation and maintenance of projects
- Enhancing the productive capacity of the rural people, by promoting income generating activities,
- Improving access to and performance of social services,
- Encourage participatory community driven development actions and approaches.

Therefore, the primary mandate of the department is "To contribute in improving the living conditions/standards of all Gambians and in particular the poor in the rural and urban areas".

In view of the new national dispensation, such as the Local Government Reform and Decentralization Act of 2002, Vision 2020, the Program for Accelerated Growth and Employment (PAGE); the Gambia's commitment to the MDGs and other international obligations, both the department and the institute are poised to play a more proactive role in building and strengthening local capacities to enhance sustainable development initiatives.

3.2.3 Department of Livestock

The Department of Livestock Services (DLS) is responsible for providing veterinary services and to keep livestock production. Its mandate includes the provision of advice with respect to livestock, to enhance the capacity of livestock producers, disease control, and veterinary public health services and to work with private sector and communities to develop the industry and enhance sources of animal protein. The Department of Livestock Services has 6 Technical Divisions: Directorate; Extension, Training and Field Services; Tsetse and Vector Control; Investigations; Industries**/**Marketing and Veterinary Public Health; Range and Feed Management.

Its staff roll comprises of a total 204 personnel composed of 6 animal scientists, 22 middle level, 70 livestock assistants and various categories of support staff. Budgetary allocations were D5.09million, D4.78 million, D4.39 million and D4.24 million in 1993, 1994, 1995 and 1996 Respectively. The Department's funding from bi**/**multi-lateral sources registered D11.65 million much of which was spent on institutional capacity building. Its recurrent budgetary requirement is estimated to be 50-60 % greater than the present which would enable it to implement its

envisaged programme and activities. Recently, the Department of Livestock Services Centre's mandate has been broadened to encompass all aspects of livestock production and health. The DLS Centre has various databases including information on health and productivity of Ndama cattle, distribution and tsetse population dynamics and the epidemiology of trypanosomiasis in The Gambia.

3.2.4 Department of Water Resources

The policy objective of the Department of Water Resources is to provide adequate water for all Gambians and the provision of timely, accurate weather and climate data, and information to safeguard the population, enhance food security and sustained national development. The Department consists of a Directorate and five technical divisions: Meteorology, Hydrology, Rural Water Supply, Water Quality Control and Communications and Data Analysis.

The core functions and responsibilities of this department include to:

- Collect and assess surface and groundwater data in both quantity, quality and in space and time;
- Provide guidance for the proper utilization and management of the national water resources
- Flood and drought prediction and management
- Observe, monitor and predict the weather and climate over the Gambia for the protection of lives and properties, contribute to sustainable development & meeting international commitments;
- Provide safe and clean water supply facilities for the rural and peri-urban communities;
- Sensitize communities on the operation and management of water supply facilities;
- Provide technical support for the design, construction and maintenance of water supply facilities; and
- Ensure that the nation’s quality of water is safe for use as desired.

In the recent past, the department made great strides in the provision of water supply in the rural areas with funding and technical support from bilateral and multilateral agencies. According to The Gambia’s Poverty Reduction Strategy Programme Paper (PRSP) II the key water sector challenge is to provide for sustainable development and management of water resources to meet higher demands for domestic water supply and sanitation, expanding irrigated agriculture to strengthen food security, and sustain environmental integrity in the face of increasing abstractions, climate change and variability, poor waste disposal, and high urbanization. The department’s current staffing levels and qualifications are described in table 4 below.

Table 4: Staff strength of the Department of Water Resources

Unit	Employed	Degree holders
Administration	38	2
Hydrology	39	2 (1)*
Meteorology	71	8 (3)*
Rural Water Supply	77	(1)*
Water Quality Monitoring and Control	7	3
Communication and Data Analysis	9	0
Total	**243**	**16**

(*) denotes staff with relevant background degrees, but have not had professional training yet

The current skills and knowledge levels of many DWR staff are basic and sometimes outdated, especially in the application of new technologies. Tertiary qualifications vary in the appropriateness for the tasks at hand and recruitment to fill vacancies and satisfy critical operational need within department's budget which needs urgent consideration.

3.2.5 National Environment Agency (NEA)

Set up in 1993 by an Act of Parliament, the mandate of the NEA is largely one of coordination, advice and consultation, overseeing compliance and providing technical services. Under the National Environment Management Act (NEMA), 1994, NEA is empowered to take direct implementation action in matters dealing with environmental impact assessment, establishing environmental quality and monitoring standards, and controlling the importation and use of pesticides and hazardous chemicals. In the area of environmental quality (mainly pollution control), the NEA has the mandate to enforce compliance with national standards and has the legal authority to seek redress whenever there is non-compliance under the guidance of the Polluter Pays Principle.

In summary, the mandates of the NEA as prescribed in the NEMA, 1994, are as follows:

- To promote, coordinate, and support the formulation of national environmental policies and to guide the execution of these policies in coordination and cooperation with other agencies of the Government, as well as to propose to the competent Government authorities any general or particular measures destined to facilitate the execution of Government's environmental policies;

- ❖ To coordinate, monitor and evaluate the GEAP and to review and revise, as necessary, its goals and strategies; to ensure full public awareness of the GEAP framework and objectives and to carry out monitoring and review of all development activities to ensure full compliance with environmental regulatory requirements in The Gambia;

- ❖ To promote, coordinate, and support the formulation of national environmental policies and to guide the execution of these policies in coordination and cooperation with other agencies of the Government, as well as to propose to the competent Government authorities any general or particular measures destined to facilitate the execution of Government's environmental policies;

  NEA's 10 Programme Areas are as follows:

  - Environmental Information System
  - Environmental Quality Programme
  - COAST Project-The Gambia
  - Environmental Education & Communication
  - Agriculture & Natural Resources
  - Coastal & Marine Management
  - Environmental Impact Assessment
  - Hazardous Chemicals & Pesticide Management
  - Elimination of Ozone Depleting Substances
  - Disaster Preparedness Contingency Planning

The NEA is also mandated, under NEMA of 1994, to coordinate and implement The Gambia Environmental Action Plan (GEAP) as well as being responsible for all environment-related issues in the country. With a nominal roll of about 92 comprising of approximately 48 % professional staff and 52 % support staff, it has three functional centres namely, Administration and Finance, Technical Services Network (TSN) and the Inter-sectoral Network (ISN).

The Agency executes its functions through programmes (listed above) manned by professional and sub-professional staff that are supported by Ten Technical Working Groups drawn from representatives of Governmental, Non Governmental Organisations and Private Sector Institutions. Each of the working groups has an agenda appropriate to its programme, develops strategies and action plans which it also implements. The Agency is the Secretariat for all the eight working groups.

The TSN has working groups in the following areas; l. Environmental Impact Assessment; 2. Environmental Quality; 3. Environmental legislation; 4. Pesticides and Hazardous Chemicals; 5. Ozone Layer; 6. Contingency and Disaster Preparedness; and 7. The Inspectorate. The working groups under the ISN have the following programmes; I. Environmental Education and

Communications; 2. Environmental Information Systems; 3. Agriculture and Natural Resources and 4. Coastal and Marine Environment

The Agency has a Documentation Centre and an Environment Information Centre (EIC) for Geographic Information System (GIS).

The Agency, in collaboration with other government departments, is responsible for ensuring that all projects implemented in the country have undergone an Environmental Impact Assessment (EIA) prior to clearance.

NEA's recurrent annual expenditure is financed through a Gambia Government annual subvention of varying ceilings, an environment levy on all salary earners in the country as well from the import tax on second vehicles while the GEAP is funded by multilateral assistance such as the current "*Support to The Gambia for Integrated Coastal Zone Management and the Mainstreaming of Climate Change (GC3SP)*" Project and the GEF-Funded "*Enhancing Resilience to Climate Change in Vulnerable Areas and Communities in The Gambia Project",* as well as Revenues accruing from import duty on second-hand vehicles, pesticide registration and royalties from sand mining are other sources of fund, though quite limited. Even though the agency may not be expected to be responsible for a large complement of staff, it however, needs to be allowed to develop its manpower resources until it has obtained the required number and quality of staff. Certainly the growth in the nominal role from 41 in 1998 to the current 92 is a perfect 100 % increase. The present inadequacies in this area include trained manpower in Policy Analysis and Development, Inspection Services and Environmental Economics. The institutional arrangements for implementing the strategic recommendations are not spelled out in the reports. It must however, be presumed that the action plans put forward will be implemented by those that proposed the Plans and some key stakeholders such as the communities and other non-governmental institutions. Thus, the institutions described above are each responsible for implementing the action plan generated by it and relevant to it. In the cases where more than one of the institutions is implicated, it is expected that a collaborative joint action will be employed as indicated in the action plans. It is also presumed that the Department of Wildlife and Parks Management will continue to be the lead institution for the overall implementation of the Convention.

3.2.6 Department of Agricultural Services (DAS)

The Agricultural sector ensures the judicious and sustainable exploitation of the country's agricultural resource base so as to conserve and improve biodiversity and enhance agricultural productivity consistent with consideration of the needs and rights of future generations.

The DAS is responsible for reducing the deterioration of the country's soil and water resources and to improve agricultural production through conservation practices and crop protection by pest control. It has seven units namely, the Soil and Water Management Unit (SWMU),

Horticultural Unit, Agricultural and Communication Unit (ACU), Agricultural Input Office, Food and Nutrition Unit, Monitoring & Evaluation Unit and the Pest Management Unit (PMU).The Department has information on the country's agricultural production systems, soil, insects, pests and other plant diseases. The DAS works very closely with the country's farmers providing extension and training services and collaborates with the NGO's that work in the sector. The nominal roll is 480 staff with about 40 % serving as support staff to the Agricultural Services Project (ASP). The department is short of trained manpower in agricultural engineering, soil science, crop pests and crop diseases in addition to information technological equipment.

3.2.7 Department of Fisheries

The Department of Fisheries is responsible for planning, management, and development of the fisheries sector. The development of the sector will be through sustainable exploitation and utilization of the country's fisheries resources to achieve increased food security, increased employment and enhanced foreign exchange earnings. The Department plays a pivotal role in the management of the resources by providing scientifically based advice on the requisite exploitation rate of the resources. It has four functional units as follows: Administration, Research and Development, Inspectorate, and Extension. Its staff roll is presently 93 with most of the professional being highly trained. There is need for increased trained manpower, equipment and funding to enable it to better come to terms with issues of the fisheries resource base and aquaculture. The Fisheries Sector promotes efficient conservation and management and development of the inland and marine fisheries, with a view of ensuring the optimum and sustainable utilization of the fisheries resources for the benefit of the Gambian people.

3.2.8 Department of Forestry

The Department of Forestry is mandated to reserve, maintain, develop and manage 30% of the total land area under forest with a view to enhance environmental protection through minimizing soil degradation and erosion, maintaining river bank stability, protecting wetlands and improving , conserving and preserving biodiversity;

- control, manage, protect and administer all State forests and control the management of private forests in accordance with the Forest legislation;
- adopt and promote methods for the protection and sustainable management of ecosystems and biological diversity in all forests and open areas;
- collect, analyse and disseminate information on forest resources and its trends to advise on areas requiring afforestation and protection of flora threatened or in danger of extinction;
- establish and promote the establishment of forest plantations and appropriate agroforestry practices
- devise and implement participatory forest management approaches, for both indigenous forest and forest plantations/agroforestry, involving local communities, traditional institutions, non-governmental organizations and other stakeholders, based on equitable gender participation;

The Department has four functional units and six regional offices as follows: Participatory Forest Management, Communication & Extension, Monitoring & Evaluation, Technical Services and Regional Forestry Offices in the six administrative areas of the country functioning as the technical and administrative arms of the directorate. The decentralization of the department's administrative structure in the 1995 Forest policy was meant to be close to the local people and forest resources in order to facilitate the transfer of forest ownership to the local communities.

The staff roll presently stands at about 259, out of which 188 are on nominal roll and 71 on wages. However, Government's budgetary allocation to the Forestry Department has increased over the years much greater funding has been provided from multi-lateral sources to boost its financial and human resource capacity, the total financial and human resources mobilized by the Department are regarded as insufficient taking into consideration its expanded functions as the revised Forest Policy (2010 – 2019). Government expenditure in Forestry (2013 Estimates) is D5million which is more than its funding from bi/multi-lateral sources (Department of Forestry). Current revenue collected by the Forestry Department is around D4 million.

As an intervention measure the Forestry Department through the technical co-operation from the German Government focuses greater attention on natural forest management in the form of Protection, improvement of silvicultural practices, testing of models to new concept and involvement of the local population. The aim is to increase and improve the total land area of managed forests.

The Department has developed an action plan, the National Forestry Action Plan (NTFAP)which centers around 15 themes, including; ensuring the development of policy institutional implementation tools; development of community forest management; refinement of principles for forest management planning for state, community and private forests; ensuring sustainable supply of forest produce for urban and rural population; ensuring licenses, permits, royalties, stumpage fees reflect replacement cost of forest produce; contribution to the coordination and harmonization of forestry activities and related sectors; and support of applied forestry research to acquire baseline data.

3.2.9 National Agricultural Research Institute (NARI)

NARI was created in 1993 to take over the activities of the former Department of Agricultural Research and Agricultural Engineering Unit, the Institution is presently responsible for research on agriculture and natural resources which include livestock, forestry, fisheries and wildlife etc. The broad mandate requires the reorganising of the existing research programme to incorporate the other components. It has a staff complement of 149. Research is conducted; at Yundum and Sapu the two main stations assisted by four out-reach stations for multi-location trials. The policy of the institute is applied client-oriented research in crops, forestry, fisheries and other natural resources.

CHAPTER FOUR: CAUSES OF BIODIVERSITY LOSS

The natural resources base of The Gambia has been subjected to a wide variety of adverse human-induced impacts. Consequently, the resources have degraded considerably to their present undesirable state. The wrong perception of natural resources as free goods for the poor and resources for the commons generally, that are replenished by God, has proved to become a catalyst for continued overexploitation, posing serious challenges and threats to biodiversity in a fast growing nation like the Gambia. Until now conservation of critical and unique entities remains an unwelcomed affair. Conservation is still faced with the challenges of increasing demand for environmental goods and services such as food, water, housing materials and land, just to name but a few. In the absence of any significant improvement in livelihood of many rural Gambians, continued exploitation of the natural resource base with the current population growth rate becomes highly inevitable. Non sustainable utilization practices including mangrove cutting as an alternative for fuel wood in much of the Greater Banjul area and for fencing and roofing purposes in the North Bank Region points to a grim future for biodiversity and its dependent human populations. Unregulated and illegal hunting practices are common throughout the entire country.

The three most persistent threats on protected area resources (National Parks, Nature and Wetland Reserves) includes logging, infrastructural developments and land conversion. Demand for timber and non-timber products from protected areas are high. Most of the protected area surroundings are being degraded. Road construction and other infrastructural developments to some extent have caused major disruption in the process and functions of key ecosystems such as wetlands. Annual burning of the forest presents a major threat to biological resources both within and outside protected areas. Non-sustainable utilization of natural resources has been in existence since time immemorial as a result of religious and cultural beliefs.

Destructive fishing practices in its various forms are common in the Greater Banjul Area and beyond to the lower reaches of the River Gambia and the rest of the country. Illegal harvesting of thatch grasses and the cutting down of tree branches to collect wild fruits is a common non-sustainable method of natural resource utilization, a practice often perpetuated by cross border poachers from neighbors(Senegal) adjacent to Baobolon Wetland Reserve in the North Bank (Management report 2007). Shifting cultivation and itinerant farming practices that enable a sizeable population to establish ownership over every single strip of land leads to further fragmentation of wildlife habitats and destruction of migratory corridors. Illegal logging of timber and fuel wood is rampant in the Foni Districts, Jarra Districts, Kombo Districts, Central River Region (CRR), Upper River Region (URR) and the Kiang West area. Industrial and household waste dumping into wetlands of Tanbi National Park, Tanji Bird Reserve and Kotu Creek is of serious concern. Continued erosion along the Atlantic coast has been attributed to numerous illegal sand mining activities in the areas of Kartong and Bijilo.

Current anecdotal report indicates occurrence of sand mining at Mandinari village, where mining is not allowed. Unregulated charcoal burning activities in Kombo East around the villages of Tubakuta, Ommorto, and Giboro demonstrate the increase dependency on natural resources by the population for their livelihood. Land tenure rights and the demand for land outside

traditional farming areas are also steadily leading to massive cutting down of mangroves to cultivate rice in the North Bank Region.

Local level intervention to restore rice ecologies through the construction of non-environmentally friendly anti-salt dams have resulted into the abandoning of potential rice growing zones in areas such as Farafeni, Kosemar, Foni Jarrol etc.

Over the past 3 decades, biological resources have been the subject of misuse and overexploitation by man. Recent population trend accelerates and deepened the process of overexploitation and consequently, the degradation of natural resources in the Gambia. With a fast growing population, the demand for sustained food production system, to provide shelter, water, clothing and better education compelled many poor rural and urban dwellers to venture into extractive harvesting methods that only further constrained future livelihood potential for the poor. The daily demand for fuel wood, construction material and income clearly underpinned the increase in illegal hunting, fishing, harvesting of wild fruits for food and medicine, among other non-sustainable practices. Proliferation of "Chain Saw Machines" further advances human ability to destroy indigenous woody tree species such as *Khaya senegalensis, Pterocarpus erinaceous, Cordyla pinnata, Prosopis africana, Terminalia macroptera, Diosphyrus mespiliformis, and Danielia oliveri* in many parts of the Gambia. Specific threats of human origin to biodiversity conservation and sustainable use are summarized below.

4.1. Forest and agricultural farming

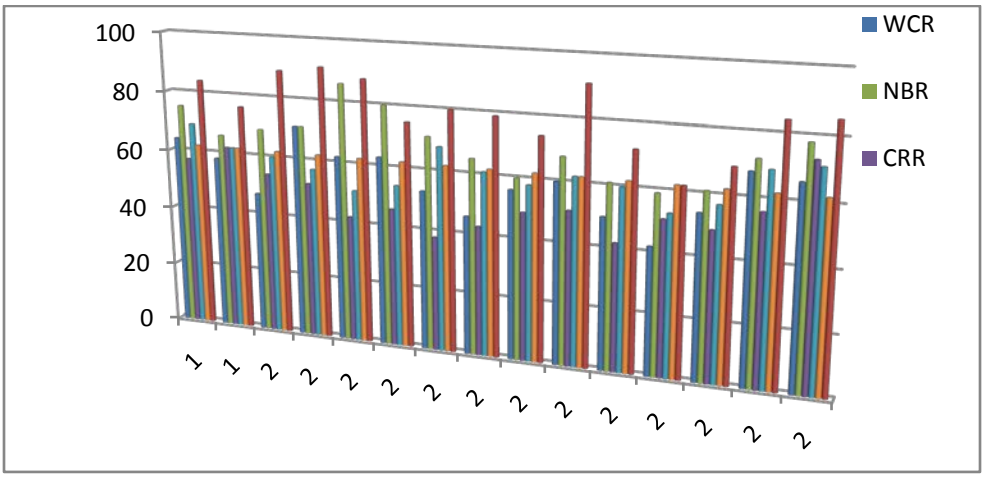
Agricultural production systems employed in crop farming consist of intensive land used types, characterized by low level of input. Shifting cultivation is still widely practiced in The Gambia, even though fallow periods have considerably reduced as land becomes scarce in most farming communities. The compounding effect of high population pressure and the scarcity of land have forced farmers to intensively cultivate a piece of land year after year. This exhausts the soil nutrients and ultimately leads to decline in crop yields. Land placed under continuous cultivation further becomes eroded with the eroded materials transported to low land areas resulting to sedimentation. With the recent introduction of early maturing upland rice in pursuit of food self-sufficiency policy compounds the continuing threats of agricultural activities on biodiversity.

4.2. Bush fires:

During the long Gambian dry season, bushfires are a common feature of the rural landscape and more than 70% of the country's forests and grasslands suffer yearly through bushfires. During the long Gambian dry season, bushfires are a common feature of the rural landscape. Bush fires are a major threat to species diversity (Figure below).

The graph results show that fires burn an average of about 60% of the country's vegetation cover. The Lower River Region (LRR) has the highest incidence of fires with an average of about 80%, while Central River Region (CRR) and West Coast Region (WCR) has the lowest incidence of fires of about 46% mainly due to the effect of community participation[3] (Sillah, 2013).

Figure 10: Trends in bushfires occurrence 1998 - 2012



Source: FAO-Gambia, WWF, 2013

The Lower River Region has the highest incidence of fires while the Central River Region and the West Coast Region have a lower incidence probably as a positive result of community participation.[4]

The inability to regulate and control wild forest fire is influenced by persistent old-fashioned policies being pursued which completely lack clear-cut measures. There is an urgent need to design new policy frameworks that recognize and adapt to current thinking and practices as they relate to natural resources. The early-dry-season control burning method of fire hotspots for example proves considerably successful.

One of the results of constant fires in forest ecosystems is a change in tree species composition to assemblages which are more fire tolerant. This change in tree species is changing the habitat and driving dependent wild animals to almost extinction.

[3]Sillah, J., Fire Management in The Gambia for the Fouta Djallon Watershed Management Project ,FAO; Project Proposal Biodiversity Hotspots, WWF, 2013

[4]Sillah, J. (2013) *Fire Management in The Gambia for the Fouta Djallon Watershed Management Project*. FAO

Table 5: Changes in forest cover between 1946 and 2015[5]

	1946	1968	1980	1993	1998	Est. 2005	Projected 2015
Closed woodland (%)	60.1	8.0	1.3	1.1	0.7	1.5	2.8
Open woodland (%)	13.3	17.6	10.7	7.8	6.2	12.0	12.2
Savannah (%)	7.8	31.7	24.8	31.8	34.6	31.5	25.0
Total forest cover (%)	81.2	57.3	36.8	40.7	41.5	45.0	40.0
Population density (person per km$^{2)}$	25.0	35.0	57.0	91.0	108.0	132.0	225.0

The table above indicates that deforestation after 1946 showed a peak in the later 1990s. The standing volume in open woodland was reduced and the closed woodland began to disappear. Less dramatic changes took place in the tree and shrub savannah where the forest cover of 1998 is almost similar to that in 1993 and is even expected to increase as from the year 2000. According to the National Forest Assessment (NFA)[6], area comparisons between 1981/82 and 1997/98 inventories and the NFA 2009/10 illustrate that the 1981/82 indicated 505,300 ha total forest area, or 44% of the total area of Gambia (1,130,000 ha); whereas the NFA 2009-2010, adjusted to include the same classes, indicates roughly that forest cover is 423,000 ha, or 37% of the total area of The Gambia. This means that since 1983, 7% of forest cover has been lost. One of the most significant losses (accounting for 73% of the overall forest loss) has occurred in mangroves, which were previously estimated to be approximately 67,000 ha and are now estimated to be 35,700 ha – a loss of roughly 47% of their previous cover. This translates to 1,080 ha of mangroves lost each year, an alarming rate of decline over the last 30 years. These results therefore indicate that there is a net decrease of 97,000 ha of forest and other wooded land from 1997/98 to 2009/10 with the species composition being narrowed even further. In spite of some uncertainty regarding data accuracy, the table shows a process of continuing forest degradation and biodiversity drain that started in the early 1950s.

Another cause of forest loss is the national fuelwood demand estimated at around 242,370 tonnes[7] annually. Each Gambian uses 0.6 kg of firewood per day and in urban areasthe per capita consumption of charcoal is 0.09 kg per day. The volume of fuelwood available in the country according to a study bythe Energy Division[8]in 2004 was about 88,000m^3 and 60% of the demand is actually met through importation. Certain species like *Pterocarpus* sp. (Rosewood)

[5]Sillah, J. (1999) *Action Plan on Forest and Wildlife Management, NAD-Gambia : Forest Resources and Plantations*. FAO
[6]Department of Forests (2010) *National Forest Assessment*. Government of The Gambia and FAO
[7]Energy Division (2004) *Energy Division Report*. Government of The Gambia
[8]Energy Division, *op.cit.*

and *Prosophis* sp. (Iron wood) are preferred for fuelwood and charcoal because of their high calorific value[9].

4.3. Overgrazing:

The Gambia has a considerable high livestock population with high stocking density. Livestock are reared on an extensive free range system in open grasslands and in rangelands. Due to the high stocking density and the incidence of annual bush fires which consumes most of the feed resources, there is always a scarcity of livestock feed during the dry months of the year. The convergence and concentration of livestock in and around isolated pockets of remaining grazing areas leads to range degradation with proliferation of unpalatable species and eventually loss of top soil.

Livestock rearing in The Gambia is on an extensive free-range system in open grasslands and in rangelands. Due to the high stocking density and the incidence of annual bushfires, which consume most of the feed resources, there is always a scarcity of animal feed during the dry months of the year. The convergence and concentration of livestock in and around isolated pockets of remaining grazing areas after wild fires lead to overgrazing and eventually soil erosion.

Degradation and depletion of rangeland resources threatens the growth of the livestock sub-sector and exacerbates degradation of the natural resource base. Rangeland occupies 40% or 400,000 ha of the country's total area, of which about 60% or 240,000 ha is used for pasture practicing transhumance[10]. Rangeland resources are often characterized by poor drainage, rocky topography and low soil fertility. While transhumance of livestock (particularly cattle) is practiced in order to increase access to pasture and water especially during the dry season, it also exposes livestock to increased incidence of disease. There is a high potential for improving rangeland resource management, as well as for improving production of feed resources through animal feed gardening, production of forage crops and utilization and preservation of crop residues.

4.4 Fuel Wood Extraction:

The cutting of trees for fuel wood is among the leading causes of deforestation in the Gambia. It is reported that forest in the Gambia provides 85% of the country's domestic energy needs in the form of fuel wood for over 90% of the population. As the population continues to increase, the fuel wood demand continues to increase unprecedentedly and put more pressure on the country's remaining forest resources. Currently, many parts of the country are facing shortage as the population of preferred fuel wood species decline. The market demand for certain species of fuel wood compelled wood vendors to harvest green wood.

[9]Department of Forests (1999) *Study on Forest and Wildlife Management*. Government of The Gambia
[10]Ministry of Agriculture (2010) *Gambia National Agricultural Investment Plan (GNAIP).* Government of The Gambia

The high demand for domestic energy has resulted in indiscriminate tree felling without regard to their slow replacement. Species like *Combretum* and *Termanalia* are particularly threatened by cutting, burning, poisoning or lopping for branch wood in order to ensure a regular fuelwood supply to households and urban markets. As the population increased, the total forest cover decreased, firstly at an accelerating rate between 1946 and 1980 and at a more constant rate from 1980 to the present day.

The table below provides a summary of fuel wood trends starting from 1983 and projected to 2013. As can be seen, the standing stock, which is the forest cover, and the annual yield or increment, is that the forest produces as supply are both depleting at a fast rate due to high population growth and increase demand. The situation is made clear with the steady growth on deficit that far exceeds the increment. This is serious as concerns future demand and success of any sustainable management.

Table 6: Fuel wood trend 1983-2013[11]

Description	1983	1993	2003	2013
Standing stockm^3	16620.0	11049.5	7652.2	4576.4
Incrementm^3	302.0	272.0	153.0	95.2
Consumptionm^3	430.0	485.1	696.4	999.8
Deficitm^3	128.0	213.1	543.4	909.6
Population in 000's	687.8	1026.8	1461.4	1800.0

One other significant cause of forest loss and degradation is land conversion – shifting cultivation, clearance for agriculture due to high population pressure, institutional deforestation as a result of exploitative policies, bushfires, and illegal exploitation. In the 1970s/80s, large areas were cleared for groundnut cultivation particularly in the North Bank Region and specifically in the Niumi, Baddibus and Fulladu districts in the Central River Region[12]. The forest vegetation of The Gambia at that time was rich in wildlife, as it constituted the habitat for a variety of large mammals which nowadays are rare or locally extinct. The forest cover which encompassed these wildlife habitats has been decimated with most of the big trees logged and the coastal gallery forest has disappeared.

4.5 Poaching/ illegal hunting:

Hunting is an important economic and social activity in the rural areas as bush meat provides important supplement to local diet. Hunting has been practiced for generations for domestic consumption of meat at household level, using dogs. With the proliferation of guns, hunters are now capable of killing per hunting trip, several individuals of different species.
Bush meat for domestic consumption gradually became commercialized as returns per hunting trip increases. Unlike traditional practices, modern hunting practices are very destructive, with

[11] Department of Forests, *op. cit.*
[12] Sillah, J. Forest Resources and Plantations in The Gambia, FAO , 1999

hunters targeting animals at watering points where success rates are high. Insufficient information on population of species hunted and inability to conduct regular monitoring of hunting activities do not permit the setting of quota system for species being hunted.


Fig.11 & 12 Confiscated guns and trophies

4.6 Over fishing of fish stocks:

Although the Gambia is reported to be endowed with adequate fish stocks, certain activities in the fishing sector such as use of wrong mesh size gill nets and industrial fishing trawlers are of concern. It has been established that The Gambia is harvesting only 40% of the Maximum Sustainable Yields (MSY) for the demersals fish species (Saine *et al*. 1997). There are however real dangers of over exploitation. The previous fishing agreement between The Gambia and the European Union (EU) had contributed to over exploitation as a result of weak regulatory measures. In the inland waters, fish stocks have been observed to have declined based on returns per fishing effort. Use of illegal fishing gears and intrusion by foreign trawlers has been considered responsible for such state of affair.

4.7 Coastline Sand Mining:

The burgeoning construction industry has always been a major user of beach sand. In the quest to meet this ever increasing demand, sand mining has become a highly disorganized and chaotic local industry. Although there are attempts by Government to control the activity, illegal sand mining is still common on much of the coastal stretch. Species of marine turtles and water birds habitats have been degraded or totally lost in certain localities. Mining activities along the coast contributes to the process of coastal erosion, threatening many protected ecosystems such as Tanji Bird Reserve, and consequently, the economic and social livelihood of coastal communities.

4.8. Coastal Erosion:

Sand mining coupled with the effect of steady removal of vegetation in respect of infrastructural development, settlements and cultivation compounded by sea-level rise climate change erode much of the coastal habitat important for marine and coastal biodiversity.

4.9. Pollution:

Discharge of both solid and liquid wastes from domestic, agriculture and industrial sources affect water quality in and around the Tanbi Wetlands National park which ultimately cause decline in fish species. Increase in some aquatic macrophytes may have created ecological imbalance and increase the proliferation of invasive species in the water bodies seldom prone for fish and fisheries breeding and nursery grounds.

4.10 Invasive and Alien Species (IAS)

Invasive species is defined as a species which is native or alien to the ecosystem and whose presence in the ecology causes or is likely to cause economic or environmental harm, or harm to human health, or animal health, or plant health. On the other hand, the invasive alien species are those that produce fertile off-springs in large numbers at a distance from their original ecosystem, compete with native species, destabilize the ecosystem, get naturalized over there and cause economic damage. The organisms pose threats to the value chains of biodiversity particularly fisheries, aquatic mammals and agricultural biodiversity. The range of these typical pests in the Gambia is wide, and should consequently require management.

If an animal, plant, or micro-organism moves into a new ecology, it can affect the resident species in many different ways. New species can parasitize or predate upon residents, hybridize with them, compete with them for food, space, water and sunlight, bring unfamiliar complications such as diseases, modify habitats, or disrupt important interactions.

According to the World Conservation Union, invasive alien species are the second most significant threat to biodiversity, after habitat loss. In their new ecosystems, invasive alien species become predators, competitors, parasites, hybridizers, and diseases of our native and domesticated plants and animals.

The Gambia has begun to experience the appearance of invasive and alien species that have significantly impacted particularly the horticultural productions. Currently, fruit trees are under huge threats posed by fruit flies and mealy bugs. Yields and qualities of mangoes, guavas, sour and sweet sops and citrus have gone down as a result of the outbreak of these pests. The vegetables, on the other hand, are equally affected by several invasive and alien pests which are causing huge negative impact to vegetable production. Many vegetable crops such as the solanaceous crops (tomato, bitter tomato and eggplant), cabbage and other vegetables have significantly suffered from the red spider mites.

In The Gambia, the invasive alien species have a range of impacts on native biodiversity including competition with the native taxa of flora and fauna, hybridisation with genetically close species, alteration of the physical and chemical characteristics of soil, modification of natural and semi-natural habitats and propagation of pests and diseases.

These species cause huge problems to indigenous and local communities, with particularly significant negative effects on their local and national economies. Species that are invasive in certain parts of the country have caused severe negative impacts on such areas.

Plant, insect and related-insect species constitute a significant representation of the alien species found in The Gambia. Of these, the prominent and the most notorious species include: invasive insects (mealy bugs, fruit flies, spiralling white flies), invasive red spider mites, invasive weeds (wild rice, African bush tea, rattlebox, sedges) and invasive birds such as the Quelea exemplified below among Figures 10 to 25.

Figure 13: Spiralling whitefly

Figure 14: Eggs of spiralling whitefly

Figure 15: Pink hibiscus mealy bug: Adult male

Figure 16: Pink hibiscus mealy bug: Adult female

Figure 17: Flowers severely attacked by the pink hibiscus mealy bug

Figure18: Cassava mealy bug (*Phenacoccus manihoti)*

Figure 19: Bitter tomato seriously attacked and webbed by red spider mites

Figure 20: Two-spotted red spider mite (*Tetranychus urticae)*

FIgure 21: Red-billed Quelea (Quelea quelea**) Male in Breeding Plumage**

Figure 22: Desert locust (Schistocerca gregaria)

Figure 23: Purple nut sedge (*Cyperus rotundus)*

Figure 24: Yellow nutsedge / Chufa (Cyperus esculentus)

Figure 25: Water hyacinth invasive (Eichhornia crassipes)

Figure 26: Field highly infested with rattlebox *(Crotolaria retusa)*

Fig. 27: Mango fruit infested with mango mealy bugs (Rastrococcus invadens)

Fig. 28: Mango leaf infested with mango mealy bugs

4.11 Aquatic Weeds

In The Gambia some important ecosystems such as the Manjie Kunda/Kololi stream is colonised by water hyacinth. Other important water bodies may fall victim under the spread of this typical invasive aquatic weed if no extraordinary steps are taken to contain the weed.

4.12 Pathways and Spread of IAS

Some invasive alien species have entered The Gambia through diverse and unknown pathways. However, trans-boundary movement of people and their commodities is apparently the cardinal cause of the introduction of some of the species presently established in the country. In general, one or more of the following pathways have enabled the entry of the invasive species currently in The Gambia:

- Natural and or trans-boundary movement of the species;
- Farming (with introduction of new plant species) by people;
- Landscaping (with introduction of some undesirable plant species like water hyacinth as ornamental, or use of non-native genotypes) by people;

- Discarding of infested materials (rubbish, or accidentally spreading seeds and plant fragments);
- Movement of infested commodities / goods, or their containers, or conveyors;
- Movement of people (by air, road, rail and sea transport); and
- Direct intentional or unintentional introduction of crops and livestock infested with pests and diseases by Agriculture and Forestry; Infrastructure development, pump and tidal irrigations through canals, runoffs of rain water**.**

CHAPTER FIVE: NATIONAL STRATEGY AND ACTION PLAN

5.1 The Overall Vision, Mission and Long-Term Goals

Vision:
Consistent with Vision 2020, the overall vision of this NBSAP is "to conserve and promote the rationale use of the national biological diversity for the benefit of the present and future generations in the manner that is consistent with the overall goal of sustainable development".

Mission:
The mission underpins this NBSAP is " to create a society that sees its self as an integral part of nature, recognizes different life forms, sustainably uses natural resources and maintains for posterity a nurturing and dynamic world rich in biodiversity".

Long Term Goals:

2011-2020 Biodiversity Strategic Plan and Aichi Targets
The NBSAP recognizes the CBD Strategic Plan for Biodiversity 2011-2020 and its Aichi Targets adopted in October 2010 (Decision X/2) as an ambitious new plan that provides an overarching framework for all the biodiversity–related conventions and biodiversity issues at national level. Setting the National Biodiversity vision, the five strategic goals, 20 General Targets, In translating the provisions to national realities the NBSAP provides an appropriate national orientation for effective response to the increasing loss of biodiversity, land degradation and climate change.

- **Strategic Goal A:** Address the underlying causes of biodiversity loss by mainstreaming biodiversity across Government and society
- **Strategic Goal B:** Reduce the direct pressures on biodiversity and promote sustainable use
- **Strategic Goal C:** To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
- **Strategic Goal D:** Enhance the benefits to all from biodiversity and ecosystem services
- **Strategic Goal E:** Enhance implementation through participatory planning, knowledge management and capacity building

5.2. GUIDING PRINCIPLES

The implementation of this NBSAP, including the determination of priorities and selection of options, will be guided by the following principles;

- Biodiversity in The Gambia belongs to Gambians, and its conservation and sustainable use is a responsibility of all Gambians.

- The conservation and sustainable use of biodiversity is the responsibility of all citizens and residents of The Gambia.

- Community participation and informed stakeholder involvement in the planning, implementation and decision making processes are a prerequisite for effective conservation and sustainable use programmes.

- The best way to conserve species is to maintain their habitats. Therefore, in-situ conservation, preferably within protected area systems using an ecosystems approach, is fundamental to the effective conservation of biological diversity and the protection of threatened species.

- Biodiversity within protected areas can be conserved when at the same time the peripheral natural habitats are used sustainably and profitably by the surrounding local communities through innovative management approaches such as community conservation, collaborative forest management, etc.

- Reliable and up to date data and information underpin rational decisions and appropriate actions for effective conservation and sustainable use of biological diversity.

- Successful conservation of biological diversity requires incorporation of the conservation and sustainable use concepts into the relevant decision making and management processes including; resource allocation and management, development appraisals and decisions and sectoral and cross-sectoral policies

- The loss of biological diversity cannot be effectively slowed down without addressing the underlying causes which include, inter alia, population size and distribution densities, level of resource consumption, market factors and policies that provide incentives for resource depletion, under valuation of environmental goods and services, inappropriate laws, policies and institutions and negligence about the roles of biodiversity, its status and the rate at which it is lost.

- Conservation and sustainable use efforts need to incorporate best practice models and cost-effective approaches and forge partnerships in action to maximize the comparative advantages of the various actors.

- Successful conservation and sustainable use of biodiversity requires appropriate supportive policies and institutional arrangements;

- An integrated approach, rather than sectoral approaches, is essential key to successful conservation programmes.

- A key ingredient to effective long term action is capacity building at all levels, community level, field, policy and decision making levels.

- Biodiversity conservation cannot succeed unless local communities assume a greater role in the planning and management of natural resources and receive a fair share of the accruing benefits.

5.3 National Biodiversity Targets

The Gambia Biodiversity National Targets, derived from the Aichi targets will be the guideline for action for the future implementation of the convention. The Gambia has developed 20 Biodiversity Targets that will expect to be attained from 2015 to 2020.

- The Targets were developed through a participatory process involving various stakeholders such as Government institutions, civil society organizations, Local authorities and communities, private sectors, individual entrepreneur among others. Such processes enabled the analysis of existing realities of the country such as level of threats, Government priorities, existing capacity, lessons from the implementation experiences on the three pillars of the CBD, and associated global provisions of the Strategic Plan 2011-2020.

- Biodiversity Targets are outlined under the five Strategic Goals of the Global Strategic Plan. Indicators and actions of the Gambian Biodiversity Targets are presented in the following action plan.

NATIONAL TARGETS

Strategic goal	Global targets 2011-2020	National targets
Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society	**Target 1:** By 2020, People are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	**Target 1:** By 2020, at the latest, 50% of The Gambia's populations are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
	Target 2: By 2020, biodiversity values are integrated into national and local development and poverty reduction strategies and planning processes and national accounts …	**Target 2:** By 2020, biodiversity values are integrated 100% into national and local development and poverty reduction planning processes and national accounts
	Target 3: By 2020, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed …….	**Target 3:** By 2020, all forms of pollution from water and land-based activities are brought to levels that are non-detrimental to ecosystem functions
	Target 4: By 2020, Governments, business and stakeholders have plans for sustainable production and consumption and keep the impacts resource use within safe ecological limits.	**Target 4**: By 2020, 50 % Governments, business and stakeholders have plans for sustainable production and consumption and keep the impacts of resource use within safe ecological limits

Reduce the direct pressures on biodiversity and promote sustainable use	**Target 5:** By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	**Target 5** By 2020, the rate of biodiversity loss, including forest fragmentation and land degradation is considerably reduced by 50%
	Target 6: By 2020 all stocks managed and harvested sustainably, so that overfishing is avoided …….	**Target 6:** By 2020, 60% of areas that are suitable for spawning and nursery grounds are protected, while the use of wrong fishing gears reduced by 40%
	Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	**Target 7** By 2020, 50% of areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity
	Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	**Target 8** By 2020, 50% of pollution, including waste and agro and industrial chemical has been brought to levels that are not detrimental to ecosystem function
	Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	**Target 9** By 2020, reduced occurrence and prevent introduction of invasive species by 50%.
	Target 10: By 2016, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning	**Target 10:** By 2020, Maintain integrity and functioning of vulnerable ecosystems impacted by climate change minimized at least 20%
Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity	**Target 11:** By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas are conserved through systems of protected areas…...	**Target 11:** By 2020, at least 5% of terrestrial and inland water, and 10% of coastal and marine areas are conserved through systems of protected areas
	Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	**Target 12:** By 2020, 35% of known threatened and rare species have been prevented from extinction and 50% extinct species reintroduced or restocked
	Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives is maintained	**Target 13:** By 2020, 35% of the genetic diversity of cultivated plants, farmed and domesticated animals and of wild relatives is maintained

Enhance the benefits to all from biodiversity and ecosystem services	**Target 14:** By 2020, ecosystems that provide essential services, including services are restored and safeguarded,	**Target 14:** By 2020, poverty would be reduced by 10% of protected area dependent communities to reduce pressure on natural resources significantly
	Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems,	**Target 15:** By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 50 per cent of degraded ecosystems
	Target 16: By 2016, the Nagoya Protocol on Access and Benefits Sharing is in force and operational	**Target 16:** By 2020, the Nagoya Protocol on Access and Benefits Sharing is in force and operational
Enhance implementation through participatory planning, knowledge management and capacity building	**Target 17:** By 2016 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated NBSAP.	**Target 17:** By 2016 The Gambia would have adopted as a policy instrument, and has commenced implementing an effective, participatory and updated NBSAP
	Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities and their customary use, are respected.	**Target 18:** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities and their customary use, are respected.
	Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	**Target 19:** By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the understanding of consequences of its loss, are improved, widely shared and transferred, and applied
	Target 20: By 2020, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources,, should increase substantially .	**Target 20:** By 2020, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources,, should increase substantially by 35%

5.4 . Implementation Strategies

<u>Strategic Goal A:</u> Address the underlying causes of biodiversity loss by mainstreaming biodiversity across Government and society

Target 1

By 2020, at the latest, 50% of The Gambia's populations are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

Technical rationale

Local communities and decision makers of The Gambia are well aware of direct uses of biodiversity, but do not recognize the value of most ecosystem goods and services. Therefore, policy makers are concerned with poverty reduction and development issues that have short term gains, but already have an impact on biodiversity. However, more efforts are required to increase overall awareness and participation of communities, policy makers, Civil Society Organizations and the Private Sector on the diverse values of biodiversity to influence the ability and willingness of the target stakeholders to make positive changes and to create more political will of the Government for effective realization of the three pillars of the Convention on Biological Diversity.

IMPLEMENTATION STRATEGY

A strategy for the implementation of this target will focus mainly on, organizing National Biodiversity Days and Focus Group Seminars & Workshops, Local drama, Wildlife Clubs, Episode and Documentary Production, use of Mass Media (Radio, TV, Print), and organizing community outreach and exchange visits among others.

Milestones

- By 2016, public awareness and education and extension outreach strategy developed
- By 2016, public awareness and education materials are produced
- By 2016-2020, implementation of the strategy
- By 2018, Midterm evaluation of the process
- By 2020, level of awareness and participation evaluated, and level of implementation reported

Target 2:

By 2020, biodiversity values are integrated 100% into national and local development and poverty reduction planning processes and national accounts

TECHNICAL RATIONALE

The values of biodiversity, especially of ecosystem services are not considered in the national accounting systems, therefore, not prioritized and are poorly funded. The objective of this target is to ensure that the diverse values of biodiversity and opportunities derived from its conservation and sustainable use are recognized and reflected in all relevant public and private decision-making such as national and local development and poverty reduction strategies.

IMPLEMENTATION STRATEGY

In The Gambia ; ensuring the recognition of diverse values of biodiversity and opportunities derived from its conservation and sustainable use, and making them reflected in all relevant public and private decision-making processes such as the national and local development, poverty reduction strategies and planning requires, *inter alia*, capacity building. Therefore, implementation of this target will start with ecosystem services valuation studies. However a communication strategy is being developed for the implementation of the NBSAP.

Milestones

- By 2017, results of the studies on valuation of biodiversity and ecosystem services are completed and published
- By 2020, values of biodiversity and ecosystem services are communicated and integrated into local and national development and poverty reduction strategies and plans

Target 3: ***By 2020, all forms of pollution from water and land-based activities are brought to levels that are non-detrimental to ecosystem functions***

TECHNICAL RATIONALE

Preventing and mitigating the impacts of pollution and the serious threats on air, land and aquatic biodiversity, is a great concern. In view of the current development prospects with an increase in land and marine based activities by large scale agro-industries, forest, port infrastructure development, fishing, livestock, tourism and other sector activities, there is a need for urgent action to prevent and mitigate the impact of the polluting substances, solid and liquid waste that will increasingly be generated across all ecosystems and within specific sectors

IMPLEMENTATION STRATEGY

A major preventive approach is to ensure the conduct of EIAs for all development projects and ensuring effective consideration of biodiversity indicators in EIAs. Also, periodic Strategic Environmental (Impact) Assessment (SEA) of policies and programmes would be useful for biodiversity conservation initiatives. Monitoring the implementation of environment management plans of corporate entities is necessary to ensure compliance. Controls and inspections need to be strengthened. Developing general waste management programs and promoting the development of specific waste management programs that prevent the contamination of both surface and underground freshwater resources is a priority in reducing the current levels of pollution. The quality (pH, temperature, electrical conductivity, and major ions) of freshwater bodies need to be monitored periodically.

Milestones

- By 2020: the implementation of environment management plans of corporate entities necessary to ensure compliance is monitored.
- By 2020: general and specific waste management programs that prevent the contamination of both surface and underground freshwater resources are developed and promoted
- By 2020: The quality (pH, temperature, electrical conductivity, and major ions) of freshwater bodies to be monitored periodically.

Target 4: By 2020, 50 % Governments, business and stakeholders have plans for sustainable production and consumption and keep the impacts of resource use within safe ecological limits

TECHNICAL RATIONALE

Most Government agencies and business sectors have plans but do not reflect biodiversity considerations in their planning and practices therefore, leading to series of environment problems such as logging, sand mining, deforestation etc. Therefore, to adequately inform the planners to mainstream biodiversity issues into their strategies is a key priority for all stakeholders.

IMPLEMENTATION STRATEGY

The Department of Parks and Wildlife Management through its GBMIS project has developed a guideline for private sector involvement in the management of wildlife in the country. This was meant to facilitate the involvement of private entities and individuals in the management of the resources in order to diversify governance type and to improve

substantial revenue generation of the subsector. This target will assist in improving advocacy for mainstreaming biodiversity issues into projects, plans and programs of institution and businesses. The target will further facilitate the alignment of the biodiversity conventions with other Multilateral Environment Agreements (MEAs) and help report the outcome of the monitoring and evaluation process.

Milestones

By 2017-2020;	Advocacy for mainstreaming biodiversity issues into projects, plans and programs would be accomplished
By 2018;	Advocacy for alignment of the biodiversity conventions with other Multilateral Environment Agreements (MEAs)
By 2020;	Monitoring and evaluation is implemented and the outcome reported

<u>Strategic Goal B</u>: Reduce the direct pressures on biodiversity and promote sustainable use

- **Target 5:**
  By 2020, the rate of biodiversity loss, forest fragmentation and land degradation is reduced by 50%

TECHNICAL RATIONALE

Over-utilization of biological resources is a major threat, contributing to degradation of rangelands, forest ecosystems, aquatic ecosystems and associated species. Therefore, sustainable management is required to biodiversity conservation and to derive benefits in such forms as soil fertility, erosion control, the well-being and sustainable livelihoods of local communities engaged in the management of natural resources.

IMPLEMENTATION STRATEGY

Criteria for sustainable management of resources have been adopted by Agriculture and Natural Resources working group and there are many efforts by the Government, local communities and CSOs geared towards promoting good practices and applying diverse governance mechanisms. There is a need to enforce the legal norms that are designed to ensure sustainable management of natural resources for posterity.

The stakeholders have experience in developing by-laws to control access and use of local biological resources but also require the understanding of the resources for subsequent up-scaling.

Milestones

- By 2017, The revised Biodiversity and Wildlife Act finalized and adopted by

Parliament

- By 2020, productivity of forage and rangelands is improved
- By 2020, Productive agricultural zones around protected areas enhanced through Sustainable Land Management (SLM)
- By 2020 Promote the use of energy saving cooking stoves
- By 2020 Restoration of degraded wetlands and landscape
- By 2020, Sustainable use of non-timber forest products is promoted
- By 2020, sustainable management, including the use of traditional resources management system to ecosystems under pressure, including hotspot ecologically sensitive areas is applied

Target 6 By 2020, 60% of areas that are suitable for spawning and nursery are protected, while the use of wrong gears reduced by 40%

Technical rationale

The Gambia is centered on River Gambia with a coastline of 80km and a continental shelf within the Exclusive Economic Zone **(**EEZ) extending 200 nautical miles from the low water mark. This area includes nearly 58,000 ha of mangrove stands and laterite reefs serving as spawning and nursery ground for fisheries species and aquatic mammals. Mangrove dieback and the rampant utilization of wrong fishing gears, depletion of fish stock and other aquatic species. However, coastal erosion also alters the nomenclature of the shoreline affecting the breeding patterns and grounds of cetaceans and marine turtles.

Implementation strategy

The country has already established a 1 nautical mile from the coastline as a fisheries protected zone and DPWM is currently managing 53,000 ha of mangroves set aside as nursery and spawning ground. To ensure sustainability of these functions there is a need to reforest or restore dieback areas affecting these wetlands through community participation. Coastal engineering is also a strong option to address coastal erosion. Engaging fisher folks and local communities to police fisheries resources and discourage the use of wrong fishing gears. Likewise programs that help to provide appropriate fishing gears and appropriate gears in exchange for wrong mesh size for fishermen will be promoted.

Milestone

- By 2020, Establishment of at least 3 marine Protected areas
- By 2020, At least 60% of degraded wetlands are restored
- By 2020, At least 40% of eroded areas are rehabilitated through coastal engineering

program

- By 2016, Establishment of local committees and mobilize volunteers to police the vulnerable spawning and nursery grounds
- By 2016, facilitate fishing gear exchange program for fishermen in exchange for wrong mesh size nets and gears.

Target 7 By 2020, 50% of areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity

Technical rationale

Habitat conversion is one of the major factors of biodiversity loss in The Gambia. Rising demand for food and other agricultural products, among others, has resulted in clearing of natural habitats to make space for agricultural land; and economic, demographic and social pressures are likely to put further pressure on habitats. Therefore, there is an urgent need to decrease and gradually cease such expansion into forest and other ecosystems. Wetland issues are incorporated in biodiversity and other sectoral policies but not adequately addressed. Currently Gambia designated 3 RAMSAR Sites and on the verge of designating more.

Implementation strategy

Habitat loss can be addressed through conservation of habitat and restoration of degraded areas. The emphasis of this target will rely on preventing the loss of high-biodiversity value habitats, such as primary forest and wetland areas. Reduction in the rate of loss and degradation of natural habitats can be achieved by adopting technologies and innovations that increase productivity of small holder farmers. This will help in increasing yields and value of crops per unit input which will result in a decrease in requirements for new agricultural lands. The other scheme is creating alternative source of livelihoods for local communities to drive off pressure from the natural habitats. There is a need to develop a wetland policy to adequately address wetland conservation and livelihood issues. Facilitating the designation of more RAMSAR Sites in order to enhance biodiversity conservation is urgent.

Milestones

- By 2020, technologies and innovations for increasing productivity of smallholder farmers and pastoralists are adopted
- By 2020, provisions of alternative livelihoods, including jobs and alternative energy sources and use of energy efficient technologies for local communities are improved
- By 2016, facilitate the preparation and accomplishment of a Wetland Policy.
- By 2017, Designate 4 new RAMSAR Sites

- By 2020, 200ha of degraded agricultural and rangeland restored.
- By 2017, encourage the expansion of aquaculture.
- By 2020, support the further designation and consolidation of community forest and reserves to ensure their rationale utilization.

Target 8 By 2020, 50% of pollution, including waste, agro and industrial chemical has been brought to levels that are not detrimental to ecosystem function

Technical rationale

The Gambia's population is growing rapidly leading to increase urbanization and subsequent dumping and industrial effluents in and around wetlands and water bodies. These include both domestic and industrial waste. Large quantity of chemical fertilizers, pesticides and herbicides are used in boosting agricultural production but detrimental to biodiversity and humans. Phasing out of ozone layer depleting substances in refrigerators is key initiative of Government to address global warming.

Implementation Strategy

The government has introduced a national cleansing programme since 2007 in order to address indiscriminate waste disposal. This ongoing programme will be consolidated through a bi-weekly exercise to ensure sustainability .Being a party to the Algiers Convention, the government of The Gambia is obliged to control the transboundary movement of POPs, ozone depletion substances and other hazardous chemicals. There is need to implement the convention in a participatory manner.

Milestones

- By 2015, consolidation of bi-weekly cleaning exercises.
- By 2016, organized massive campaign against illegal dump sites industrial effluent waste.
- By 2017, regulate and control the transboundary movement of POPs and other hazardous chemicals.
- By 2017, facilitate the implementation of the Algiers Convention.
- By 2020, phase out of ozone depletion substance

 **Target 9:** By 2020, reduced occurrence and introduction of invasive species by 50%.

Technical rationale

Invasive species are threats to biodiversity and ecosystem services. In Gambia, invasive species are spreading rapidly in protected areas and other water bodies causing a reduction in species occurrence and availability. They are also affecting productivity in the wetlands. They are displacing indigenous species of natural ecosystems. Though the extent of the damage is not established, they are becoming threat to food security. Therefore, they need to be controlled and eventually eradicated.

Implementation strategy

Invasive species ranging from native to alien (such as water hyacinth, lantana camara, phragmites australis, typha australis) are identified in different areas in The Gambia. It is necessary to prioritize control and eradication efforts to those species and pathways which will have the greatest impact on biodiversity. Therefore, it is important to search for most effective ways that would address invasive species related constraints specific to the country. It is also crucial to put systems in place to monitor invasiveness of newly introduced species. The development and implementation of invasive species action plan is of paramount importance.

Milestones

- By 2015, Invasive species action plan is developed.
- By 2016, Invasive species action plan implementation commenced
- By 2018, Monitoring of implementation status
- By 2020, Area covered by the invasive species is reduced by 50%
- By 2020 Encourage the use of invasive species as biomass energy and organic manure

 **Target 10:** By 2020, all vulnerable ecosystems impacted by climate change minimized at least 20%

Technical rationale

Climate change and climate variation are negatively impacting on ecosystems and consequently on the wellbeing of the populations that depend on ecosystem resources for their livelihoods. Therefore actions need to be put in place that reduce the negative impacts of climate change and climate variation and enable affected communities to effectively adapt to climate change and climate variation through sustainable agricultural and livestock practices, integrated freshwater catchment management, and afforestation/reforestation programmes. The future

REDD+ mechanism envisaged in Target 15 is also a major strategy to reduce GHG emissions as they address the direct and indirect causes of deforestation and degradation.

Implementation strategy

There are huge efforts of forest ecosystem restoration through area enclosures and massive tree plantings in the Gambia. Increasing forest cover, designation of wetlands and restoration of degraded areas are the major activities required to realize this target. Participatory Forest Management which is underway in different parts of the country will be strengthened through 2020. Moreover, climate change mitigation activities such as NAPA and NAMA strategy will be widely implemented.

Milestones

- By 2020, areas under forest cover, designated wetlands and restored degraded areas are increased by 30%, 50% and 50%; respectively
- By 2020, incentives for the local communities through NAPA and NAMA from high forests, woodlands and traditional agro-forestry are generated.

Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Target 11: By 2020, at least 5% of terrestrial and inland water, and 10% of coastal and marine areas are conserved through systems of protected areas

Technical rationale

Establishing effective protected area system has proven to be the best way of conserving fauna and flora. About 6.4% of the country's surface area is designated as Protected Areas. There is a need to increase the area coverage considering ecosystem representativeness, connectivity and management effectiveness. Inadequate law enforcement, poor coordination, insufficient facilities and infrastructure, absence of wild life corridors, weak capacity and low staff remuneration are among the problems that need to be addressed in this target. There are encouraging efforts being made by DPWM, in their quest to restructure the Department into a Wildlife Authority. Absence of economic valuations of PAs is another obstacle to conservation and sustainable use.

Implementation strategy

To realize this target, some of the PAs will require physical boundary demarcation and new management plans. It also requires establishment of additional PAs particularly Indigenous Community Conserved Areas and private protected areas. The PAs are being managed in close collaboration with local communities. These communities are fully engaged in governance and

management of PAs. With the ratification of the Nagoya Protocol on ABS, the country is committed to implement benefit sharing mechanism. Carrying-out economic valuation of PAs is also important to give greater visibility amongst policy makers and integrate benefits from PAs into poverty reduction and development plans so as to ensure sustainability.

Milestones

- By 2016, Boundary demarcation and development of management plans for PAs
- By 2020, additional ecologically representative PAs are established especially ICCAs.
- By 2020, economic valuation for seven PAs is conducted

Target 12: By 2020, 35% of known threatened and rare species have been prevented from extinction and 50% extinct species reintroduced or restocked

Technical rationale

The Gambia was rich in biodiversity but due to traditional hunting, the fragmentation of ecosystems and forest fires influence the destruction of migratory corridors and habitats of important species. Rapid population growth and urbanization also contributed to the shrinking of suitable habitat for wildlife species. Due to the above mentioned problems some species became extinct and others threatened or rare. The conservation of such species is the utmost priority to the Gambia.

IMPLEMENTATION STRATEGY

This target will endeavor to build connectivity gaps between ecosystems in order to facilitate safe migration of species. This initiative will also enable to address adequately rampant forest fires in order to prevent species loss and habitat alteration. However, some lost species will be re-introduced back to their original habitat to boost revenue generation and ecosystem equilibrium.

MILESTONE

- By 2016, Identify existing and potential protected areas where Endangered and Critically Endangered species are confined (Known as Highly Ecological & Sensitive Zones or HESZ)
- By 2016, conduct an analysis to highlight those HESZ, that could benefit from new or enhanced protection, and develop an action plan to advance their conservation
- By 2016, Establishment and management of connectivity corridors
- By 2015-2020, annual early burning, promoted and facilitated
- By 2020, most extinct species would have been restocked.

Target 13: By 2020, 35% of the genetic diversity of cultivated plants, farmed and domesticated animals and of wild relatives is maintained

Technical rationale

Due to limited capacity and lack of effective enforcement and follow up mechanisms for the implementation of the ABS, The Gambia government has acceded to the Nagoya Protocol on ABS in July 2014 but there is need to develop a legal framework to facilitate its implementation. The International Trypanotolerance Center (ITC) and the Department of Livestock Services are doing some genetic preservation of endemic ruminants such as the Ndama cattle, the Djalonke sheep and the West African dwarf goat. Therefore, concerted efforts are required to maximize access of potential genetic materials and equitable sharing of benefits accrued from their utilization.

Implementation strategy

Implementation of this target will require research to identify potential genetic resources for access (bio-prospecting) and knowledge management. It will also promote marketing of bio-prospected species, capacity building and awareness raising on ABS at various levels. Moreover, bio-piracy control activities will be conducted under this target.

This strategy intends to promote the preservation of genetic diversity through ITC, NARI and Department of Livestock Services programs and encourage academic research on genetic related issues.

Milestones

- By 2016, Research to identify potential genetic resource for bio-prospecting and knowledge management conducted
- By 2016, Promote preservation of genetic diversity of species
- By 2016, Sustainable production and productivity of livestock improved to meet 75% of the national demand in meat and meat products and increase milk production by at least 25% over present level.

Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services

Target 14: By 2020, poverty would be reduced by 10% of protected area dependent communities to reduce pressure on natural resources significantly

Technical rationale

More than 90% of the local communities peripheral to Protected Areas are very poor and therefore, involved in the exploitation of natural resources for their livelihood. Almost all these communities are engaged in agricultural activities thereby affecting land cover and soil productivity. Increase population, and the high consumption rate of natural resources influenced by technology use (chainsaw and agricultural mechanization) has drastically impacted the country's biodiversity.

Implementation strategy

The government of the Gambia is piloting a bio-right program for local communities living around Protected Areas in the form of bee-keeping, village banking, community woodlots and oyster culture. This initiative is meant to provide alternative livelihood to reduce pressure on natural resources. This target will contribute towards the establishment of sustainable financing mechanism for the benefit of local communities. It will assist in improving soil productivity and enhance biodiversity conservation. The DPWM will pilot conservation tillage in the North Bank Region in order to promote agro-forestry and prevent the use of mechanized agricultural practices. Discourage the use of chainsaw.

Milestones

- By 2020, Planting of (1,000,000) nutrient enriching plants or trees
- By 2020, Facilitate the implementation of 5 bio-rights programs
- By 2020, Create employment opportunities for community living peripheral to Protected Areas by at least 10%

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 50 per cent of degraded ecosystems,

Technical rationale

Conservation, restoration and sustainable management of forests, woodlands, wetlands and other ecosystems are proven and available means to sequester carbon dioxide and prevent the

release of the other greenhouse gases. The coastline of The Gambia is eroding unprecedentedly affecting ecosystem, communities and species. Most fresh water wetlands are almost over flooded and invaded by phragmites spp, water hyacinth and typha spp. Due to sea level rise communities living in the fringes of Tanbi Wetland National Park are exposed to seasonal flooding. Climate change is responsible for salinization into rice growing areas and thus impacting the livelihood of vulnerable communities. Efforts to control salinization have subsequently caused mangrove diebacks.

Implementation strategy

There are huge efforts of forest ecosystem restoration through mangrove and other tree planting exercises. Increasing forest cover, designation of wetlands and restoration of degraded areas are the major activities required to realize this target. Protected Areas diversification which is underway in the Gambia will be strengthened to establish more Protected Areas, expand existing protected areas and ensure restoration of biodiversity within and outside biodiversity hotspots. Moreover, climate change mitigation activities in the NAPA and NAMA documents are being implemented. To optimized the use of runoff water through soil and water conservation techniques and to promote wetland engineering in communities prone to seasonal flooding.

Milestones

- By 2020, incentives for the local communities through woodlots and traditional agro-forestry mitigation activities and programmes are implemented.
- By 2020, Encourage construction of appropriate dykes, gulley plugs, bridges, spillways and contour bunds
- By 2020 Encourage Environmental Impact Assessment (EIA) before developing any project affecting biodiversity

Target 16: By 2020, the Nagoya Protocol on Access and Benefits Sharing is in force and operational

Technical rationale

The Nagoya Protocol on Access and Benefits Sharing (ABS) is the third objective of the CBD. The Gambia has ratified the protocol in July 2014 and has successfully put in a place a roadmap for its successful implementation. The roadmap entails issues that need to be addressed such as policy and legal arrangement, sensitization of policy makers, resource inventories, institutional arrangement and capacity building.

Implementation strategy

To implement this target, there is need to develop a legal norm by mainstreaming ABS into the existing Biodiversity Laws supported by a separate regulation. An institutional arrangement for the implementation of ABS will be defined by the regulation. Resource inventory and capacity

building will be conducted to determine the current status. All these initiatives will culminate into awareness creation of policy makers and the general public.

Milestones

By 2016, ABS issues are mainstreamed into the reviewed NBSAP

By 2016, Mainstream ABS issues into the existing revised Biodiversity/Wildlife Act

By 2016, develop an ABS regulation

By 2016, establish institutional arrangements

By 2017, Conduct a baseline study on GR and ATK and assess capacity gaps

By 2018, organize capacity development on ABS

By 2018, Documentation of TKs

By 2020, Monitoring and evaluation of the implementation status.

Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building

Target 17: By 2016 The Gambia would have adopted as a policy instrument, and has commenced implementing an effective, participatory and updated NBSAP

Technical rationale

To fulfill the obligations under Article 6 of the Convention, The Gambia prepared its first Biodiversity Strategy and Action Plan (GBSAP) in 1999. After a decade of implementation the document was subjected to revision and updating. The GBSAP sets out the overall goals, principles and strategic actions through participatory planning and implementation for the conservation and sustainable use of biodiversity in The Gambia. This revised document will further address emerging issues and all other associated issues and support its mainstreaming into policies, programs, plans of sectoral, cross sectoral and other relevant stakeholders.

Implementation strategy

Participatory stakeholder involvement throughout the design, planning and implementation of NBSAP is essential to ensure that the plans will be effectively communicated and implemented by the relevant stakeholders. Thus the updated NBSAP, the Fifth National Report and the creation of the Clearing House Mechanism (CHM) are the major outcomes of the revision process. This target shall endeavor the smooth implementation of its action plan and associated plans like NAPA, NAMA, PAGE etc

Milestones

- By 2014, Fifth National Report on CBD submitted
- By 2015, NBSAP prepared, validated and submitted to CBD Secretariat
- By 2016, Implement the NBSAP strategy and all the associated plans
- By 2015, Prepare, host and launch a CHM portal for information sharing
- By 2018, Implementation of Monitoring & Evaluation plan
- By 2020, Review and update 2nd NBSAP

Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities and their customary use, are respected.

Technical rationale

The Gambia comprises of 6 ethnic groups and several minor ones. Each of these ethnic groups has cultural connection with certain species of plants and animals. These take the form of rituals, cultural belief systems, and knowledge of specific species such as medicinal plants. However this knowledge is sufficiently utilized in the modern resource management, scientific research and commercial domains. There has been little effort to study and document indigenous knowledge and as the older people die, this knowledge is lost. There is urgent need to recognize, document and promote the application of indigenous knowledge and at the same time establish a legal and policy framework to protect illegal access to and use of this knowledge and to ensure that holders of such knowledge are protected and equitably rewarded. However local communities are privileged to use the resources in a sustainable manner but there is no modality of the utilization of these resources.

Implementation strategy

In The Gambia, documented community knowledge, innovations and practice of local communities, relevant for conservation and sustainable utilization of biodiversity are absent. Carry out research and ethno-biological studies to document the indigenous knowledge, practices and innovation of local communities. There is also need to establish legal and other measures to protect, preserve and maintain the indigenous knowledge, innovation and practices of local communities embodying lifestyle relevant for the conservation and sustainable use of biodiversity. This target will help to promote the customary use of biodiversity, traditional resource management systems with measures that ensure equitable sharing of benefits. And finally develop national intellectual property rights systems, including safeguarding the knowledge and innovation of local communities.

Milestones

- By 2016, Carry out research and ethno-biological studies to document existing indigenous knowledge, practices and innovations
- By 2017, Establish and implement legal and other measures to protect, preserve and maintain the indigenous knowledge, innovations and practice

Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the understanding of consequences of its loss, are improved, widely shared and transferred, and applied .

Technical rationale

There is limited information on values, functioning, status and trends and the consequences of loss of biodiversity. Therefore, there is an urgent need to generate new knowledge and compilation of exiting information which will help to identify threats to biodiversity and determine priorities based on status, trends and values for conservation and sustainable use. Achieving this target will also benefit the other targets of the Strategic Plan by encouraging new research, the development of new technologies and improved monitoring. Effective implementation of the target will also strengthen the policy-science integration through information access.

Implementation strategy

Implementation of this target will require generation and compilation of biodiversity related knowledge and information on the values of biodiversity and ecosystem services, functioning, status and trends, and the consequences of loss of biodiversity. This requires more investment in research, including modeling and participatory research approaches. Improvements are also needed in the policy development, based on scientific research.

Milestones

- By 2016, valuation studies on at least two species and three ecosystems are conducted
- By 2016: encourage academic research in biodiversity issues.
- By 2020, information on status, threats, trends and uses of biodiversity and its conservation status, and ABS related issues are consolidated and are applied for development and further research.

Target 20: By 2020, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources,, should increase substantially by 35%

Technical rationale

One of the major obstacles for the implementation of the previous NBSAP was limited capacity, both in terms of financial and human resources. Therefore, external funding is critically required to fully implement the actions outlined in the strategy of the revised NBSAP. Government Budgetary allocation for biodiversity conservation is increasing from year to year. There are also additional resources from multilateral and bilateral donor agencies expected to become available through mechanisms such as GEF, Regional Program for Marine Conservation (PRCM) and schemes related to ecosystem based adaptation to climate change and Biodiversity conservation.

Implementation strategy

The NBSAP should be initiated and implemented through full support and willingness of the stakeholders and the Government. However, financing will be required from both domestic and international sources. The Government will endeavor to increase budgetary allocation to Biodiversity conservation programmes. Other sources of financial support, including Bilateral, and multilateral donors, private foundations, support from business and industrial sectors, taxes and royalties/fees from natural resources base activities will be explored. A National Biodiversity Trust fund has been established into which 50% of all revenues generated from Biodiversity conservation is deposited and subsequently used for conservation activities.

Milestones

- By 2015, development of a financing plan
- By 2016, Put in place the board of trustees to manage the BTF
- By 2016, Access funds from the BTF for re-investment into Biodiversity conservation programs
- 2016-2020, Development of project profiles for the implementation of the revised NBSAP

5.5 ACTION PLAN

LOGICAL FRAMEWORK

In a logical framework, the Biodiversity Strategic Goals and Targets have been translated into general actions for interventions with specific ecosystem priorities identified for each Strategic Goal following key guidelines of the ecosystem approach under the CBD; with due consideration to the following issues:

- Focus on mainstreaming biodiversity into national/sub national development policies and programs.
- Strengthen the implementation of other MEAs and related protocols/agreements
- Enhance benefit-sharing.
- Use adaptive management practices.
- Carryout management actions at Protected Area level.
- Ensure inter-sectoral collaboration and harmonization
- Ensure participation of stakeholders especially local communities

5.5.1 STRATEGIC GOALS

The Strategic Goals as defined in the previous chapters provide the five major areas for intervention. These areas are aimed at redressing the drivers of ecosystem degradation and biodiversity loss (Strategic Goal A); the consequences of the drivers on the physical and ecological environment (Strategic Goal B); the consequences on the socio-economic environment (Strategic Goal C); strengthening the capacity measures to managing biodiversity loss (Strategic Goal D) and Enhance implementation through participatory planning, knowledge management and capacity building (Strategic Goal E).

5.5.2 TARGETS

For the implementation of the global strategic goals, the Gambia has domesticated 20 Aichi Targets. For each Goal, a set of Targets have been defined and provide the orientation to identify actions which will enable the redress of specific issues that contribute to the loss of biodiversity. The action plan adopts a flexible approach. Ecosystem-based specific targets are not in exclusion of the general targets but ensure that specificities of ecosystems are taken into consideration. Priorities for the Strategic Goals and Targets, also set a flexible stage for sector-based intervention based on the specificity of each sector, and give the responsibility to each sector to lead in a highly consultative manner, in the process of defining sector based priorities. Again, the targets provide a context for developing large and medium size projects with a focused orientation in addressing key challenges of biodiversity.

5.5.3 PRIORITY ACTIONS FOR INTERVENTION

In a systematic approach, priority actions have been identified for each target. While the actions identified may not be exclusive for intervention, these actions constitute the high

priority and medium priorities for interventions that will enable a significant contribution to the realization of the goals within the defined time frame for the plan. The actions have also been translated into a matrix to enable an effective determination of the time frame for action, performance indicators and the actors/organizations responsible for the implementation.

5.5.4 TIME FRAME

In compliance with milestones set in the implementation strategy, setting the time frame for intervention seeks to be in coherence with both national and global processes. The time frame by 2020 for all targets is the preferred option and is compliant with the commitments made under the Convention on Biological Diversity and enables coherence with the timeframe of the 2011-2020 Strategic Plan for the Convention and the Aichi Targets for Biodiversity.

5.5.5 PERFORMANCE INDICATORS

A monitoring and evaluation plan integrated in this document will assist to determine the extent of progress in the implementation of this NBSAP. This will be effective where pre-determined criteria indicators are set to measure progress.

5.5.6 IMPLEMENTING ORGANISATIONS

The Plan recognizes the role of all actors ensuring the effective conservation and sustainable use of biodiversity. These actors who were consulted and participated in developing the revised NBSAP, have been identified with regard to their specific mandates and areas of interventions to participate in the implementation of the plan.

5.5.7 STAKEHOLDER ANALYSIS AND PARTICIPATION

The implementation of the action plan goals and targets is designed to be participatory including many actors especially the government, CSOs, local communities, sub regional organizations, private sector, bilateral organizations, international organization, regional organizations and parastatals.

NBSAP Action Plan

Table 11. Strategic goals, targets, actions, implementing agencies and period of implementation

Gambian Targets by Goals	Indictors	Actions	Implementing Agency		Implement period	Budget (USD)
			Lead	Collaborators		
Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society						
Target 1 By 2020, at the latest, 50% of The Gambia's populations are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably	Communication, Education and Public Awareness (CEPA) Strategy Educational materials Implementation , monitoring and evaluation report	develop public awareness and education strategy	DPWM	NEA, Forestry, Fisheries, Water Resources, Media, WABSA, BAJ, Stay Green Foundation, Agricultural Communication, education & Extension Services, NARI, Ministry of Environment, Sahel Wetland Concern, MOBSE,UTG,MOHERST,MWT, NAM(SC),NFP,FFF,NRA	2016	**2,000**
		produce public awareness and education materials			2016	**1,000**
		implement key activities			2016-2020	**4,000**
		Monitoring and evaluation of the implementation			2018	**1,000**
		Reporting			2020	**1,000**
Target 2 By 2020, biodiversity values are integrated 50% into national and local development and poverty reduction planning processes and national accounts	Published valuation study reports Communication Strategy Paper Poverty reduction strategy document Mainstream biodiversity into PAGE	Commission study and publish results of valuation of biodiversity and ecosystem services	Consultant/ DPWM/Finance planning unit	Ministry of Environment, Ministry of Finance, Forestry, Fisheries, Water Resources, Geology, Ministry of Energy, NARI, UTG, GRTS, Community Radios, BAJ, Agricultural Communication Unit, Njawara agricultural training centre,MOICT,CSOs	2017	**3,000**
		communicate and integrate values of biodiversity and ecosystem services into local and national development and poverty reduction strategies and plans			2017	**2,000**

	Corporate entity Monitoring report Monitoring reports on general Waste management programme	Monitor the implementation of environment management plans,eg (EIA,ESMP) of corporate entities.		DPWM, Ministry of Environment, Ministry of Health & Agriculture, Trade and Industry, , Water	2015-2020	**5,000**
Target 3: By 2020, all forms of pollution from water and land-based activities are brought to levels that are non-detrimental to ecosystem functions	Evaluation reports on of freshwater pollution Specific waste management programme document Monitoring reports on freshwater bodies	Develop waste management programs that prevent the contamination of both surface and underground freshwater resources	NEA &	resources, NAVY, Fisheries, CSOs, water quality Laboratory, UTG, students and researchers, Area Councils and Municipalities	2016	**1,500**
		Implement contingency plans				
		Periodically monitor the quality (pH, temperature, electrical conductivity, and major ions) of freshwater bodies.			2015-2020	**10,000**
Target 4: By 2020, 50 % Governments, business and stakeholders have plans for sustainable production and consumption and keep the impacts of resource use within safe ecological limits	Mainstreamed Biodiversity into project and programme documents Advocacy reports EIA, Biodiversity impact assessment Monitoring and Evaluation reports on advocacy programmes	Implement advocacy for mainstreaming biodiversity issues into projects, plans and programs	MOTIE	DPWM, UNDP, Agriculture, Chamber of Commerce, GIEPA, Women and Youths Associations, CSOs, Water Resources, NEA	2017-2020	**15,000**
		Advocate alignment of the biodiversity conventions with other Multilateral Environment Agreements (MEAs)			2017-2020	**1,500**
		Monitor and evaluate the implementation and report outcome			2017-2020	**2,000**

Targets by goals	Indictors	Actions	Implementing Agency		Implement period	Budget (USD)
			Lead	Collaborators		
Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use						
Target 5 By 2020, the rate of biodiversity loss, forest fragmentation and land degradation is reduced by 20%	Revised Biodiversity related policies, regulations and Acts Etc.	Finalize the revised Biodiversity and Wildlife Act	DPWM/MOJ/ DOA/DOF	DCD, MOE, DOA, DLS, DoF	2017	**2,000**
	Assessment report on forage and rangelands	improve productivity of forage, rangelands and control of trans humans			2015-2020	**10,000**
	Report on SLMP activities	enhance productive agricultural zones around protected areas through Sustainable Land Management (SLM) approaches			2015-2020	**5,000**
	No of households using energy saving cooking stoves	research and monitoring			2015-2020	**50,000**
		Sensitization of stakeholders				
	Hectares of land restored	Promote the use of energy saving cooking stoves in communities around PAs			2015-2020	**25,000**
		Restore degraded wetlands and landscape			2015-2020	**10,000**
	No. and scale of community alternative livelihood programs & activities	Promote Sustainable use of non-timber forest products			2015-2020	**5,000**

	No. of hectares under community management	apply sustainable management, including the use of traditional resources management system to ecosystems under pressure, including ecological sensitive hotspot areas			2020	**1,500**
Target 6 By 2020, 60% of areas that are suitable for spawning and nursery are protected, while the use of wrong gears reduced by 40%	3 MPAs gazetted Percentage of restored wetlands and eroded coastal areas (hectares) Evaluation reports on degraded areas and eroded wetlands No of local committees established No. of volunteers participating in resource policing No. of wrong fishing gears collected	Establish at least 3 marine Protected Areas	DPWM/ Fisheries	Ministry of Environment, Parliament, NAVY, Fisheries Associations, Local communities, CBOs, NEA, Lands and Survey, DoF, PoWPA	2015-2020	**20,000**
		restore at least 20% of degraded wetlands			2015-2020	**3,000**
		Sensitization of the local communities				
		Enforcement of environmental laws and regulations				
		Rehabilitate at least 40% of eroded areas through coastal engineering program			2015-2020	**75,000**
		Establish local committees and mobilize volunteers to police the spawning and nursery grounds			2016	**1,000**
		Facilitate exchange program for fishermen in exchange for wrong fishing gear			2016	**2,000**

Target 7 By 2020, 50% of areas under agriculture, aquaculture, and forestry are managed sustainably, ensuring conservation of biodiversity	Varieties of innovative technologies used by smallholder farmers and pastoralist No. of new jobs and opportunities created Wetland policy document 4 RAMSAR sites designated No. of Aquaculture farms sustainably managed (200 ponds) No. of community forest designated M & E reports	adopt technologies and innovations for increasing productivity of smallholder farmers and pastoralists	NARI/DOF/ DoFish	DoF, NEA, DPWM, DWR, DoA, DLS, DoFish, MoE, WETLAND INT.CBOs,DCD	2020	**7,000**
		improve provisions of alternative livelihoods			2020	**1,000**
		promote solar energy use for local communities			2020	**10,000**
		Facilitate the development of a Wetland Policy.			2016	**2,000**
		Designate at least 4 new RAMSAR Sites			2017	**60,000**
		Restore 200ha of degraded agricultural and rangeland.			2020	**15,000**
		Encourage the expansion of aquaculture.			2020	**25,000**
		Promote participatory forest management			2020	**10,000**
Target 8 By 2020, 50% of pollution, including waste and agro and industrial chemical has been brought to levels that are not detrimental to ecosystem function	No. of cleansing exercise conducted per month No. of illegal dumpsites rehabilitated No of cases of POPs movement reported and regulated Report on ozone depletion substances phase out	Consolidate bi-weekly cleaning exercises.	NEA	Area councils and municipalities, local authorities, DPWM, Public Health, Transport Union, Fisheries, Forestry, Water resources, Agriculture, Manufacturing industries, etc	2016	**500**
		Organize massive awareness campaign against illegal dump sites.			2016	**1,000**
		Regulate and control the transboundary movement of POPs and other hazardous chemicals.			2017	**1,000**
		Facilitate the implementation of the Algiers Convention. Conduct water quality analysis and sanitary shoreline survey			2017	**2,000**

		phase out of ozone depletion substance countrywide			2020	**3,000**
Target 9 By 2020, reduced occurrence and introduction of invasive species by 50%.	IAS action plan Monitoring report No. of hectares reduced Weight of biomass energy converted	Develop and implement Invasive species action plan	NARI/Plant Protection	DPWM, DOA, DOF, DPWM, DCD,	2015	**2,000**
		Convert invasive weeds to useful products (eg. Charcoal, mats etc.)			2016	**1,500**
		Monitor implementation status			2018	**1,000**
		areas colonized by the invasive species reduced by 50%			2020	**1,000**
		Encourage the use of invasive species as biomass energy and organic manure			2020	**5,00**
Target 10: By 2020, all vulnerable ecosystems impacted by climate change minimized at least 20%	Percentages of restored areas No. of local communities projects	Increase, designate and restore areas under forest cover, wetlands and other degraded areas by 20%, 50% and 30%; respectively	DOF/DPWM	DCD, Water Resources, MOJ, Ministry of Environment, Local communities	2015-2020	**70,000**
		Promote implementation of NAPA and NAMA . Sensitization			2020	**2,500**

Targets by goals	Indictors	Actions	Implementing Agency		Implement period	Budget (USD)
			Lead	Collaborators		
Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity						
Target 11: By 2020, at least 5% of terrestrial and inland water, and 10% of coastal and marine areas are conserved through systems of protected areas	No. of PAs demarcated	Demarcate protected area Boundaries	DPWM	NEA, Department of Physical planning, DOA, Local communities, DCD, CSOs, MOF, DOF, MOECCWW, MOJ	2016	**35,000**
	No. of management plans developed and updated	Develop and or update management plans for PAs			2016	**80,000**
	Gazette notice of ICCAs established	Establish additional ecologically representative PAs especially ICCAs.			2015-2020	**60,000**
	Valuation report of PAs	conduct economic valuation for Twenty-two PAs			2017	**35,000**
Target 12: By 2020, 35% of known threatened and rare species have been prevented from extinction and 50% extinct species reintroduced or restocked	Identify existing and potential protected areas where Endangered and Critically Endangered species are confined	Establish new PA's in identified Highly Sensitive Ecological Zone	DPWM	DOF, Local Authorities, Local communities, Eagle Heights, Kanilai Family farm, Veterinary Service	2016	**30,000**
		Prepare management plan for all new PA established				
	conduct an analysis and develop action plan for their conservation	Establish and manage connectivity corridors				
	No. of connectivity corridors	Promote and facilitate annual early burning			2015-2020	**25,000**
	No. of PAs that conducted early burning	Re-introduce most extinct wildlife species			2015-2020	**50,000**
	Amount of species re-introduced					

Target 13: By 2020, 35% of the genetic diversity of cultivated plants, farmed and domesticated animals and of wild relatives is maintained	Research report on genetic resources No. gene banks for species genetic preservation Established Level of production/self-sufficiency in meat and milk production	conduct research to identify potential genetic resource for bio-prospecting and knowledge management	ITC/NARI	DLS, DPWM, MOTIE, MOA	2016	**3,000**
		Promote preservation of genetic diversity of species			2016	**2,000**
		improve Sustainable livestock production and productivity to meet 75% of the national demand in meat and meat products			2016	**2,500**
		Increase milk production by at least 25% over present level.			2015-2016	**15000**
Targets by goals	**Indictors**	**Actions**	**Implementing Agency**		**Implement period**	**Budget (USD)**
			Lead	**Collaborators**		
Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services						
Target 14: By 2020, poverty would be reduced by 10% of protected area dependent communities to reduce pressure on natural resources significantly	No. of hectares planted Percentage survival rate of trees No. Communities Benefited from biorights projects No. of job created	Plant (1,000,000) nutrient enriching plants or trees	DPWM	Local Communities, DOF, DOA, WABSA/CSO's, NEA	2015-2020	**10,000**
		Facilitate the implementation of 5 bio-rights programs			2015-2020	**3,000**
		Create employment opportunities for community living peripheral to Protected Areas by at least 10%			2016-2020	**5,000**
Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 50 per cent of degraded	No. of established woodlots, range lands and restored ecosystems No. of hectares of agricultural land restored	provide incentives for the local communities through woodlots and traditional agro-forestry	DPWM/DOF	Local Communities, DCD, DOF, DOA (Soil and Water management Unit),	2015-2020	**10,000**
		Construct appropriate dykes, gulley plugs, bridges, spillways and contour bunds			2020	**15,000**

ecosystems	No. of Dykes, gulley plugs, bridges, spillways and contour bunds completed EIAs conducted on degraded ecosystems	Encourage Environmental Impact Assessment (EIA) before developing any project affecting biodiversity		NEA, MOECCWW, DLS	2020	**10,000**
Target 16: By 2020, the Nagoya Protocol on Access and Benefits Sharing is in force and operational	ABS component in the Revised NBSAP Revised Biodiversity/Wildlife Act Institutional arrangement in place GR and ATK database developed Monitoring and Evaluation report	mainstream ABS issues into the revised NBSAP	DPWM	MOECCWW, MOJ, National Assembly, OP, TK association, DOA, DOF, Custom & Exercise Department, Local communities, security agents	2016	**1500**
		Mainstream ABS issues into the existing revised Biodiversity/Wildlife Act			2016	**1,000**
		Develop an ABS regulation			2016	**1,000**
		Establish institutional arrangements for ABS implementation			2016	**1,000**
		Conduct a baseline study on GR and ATK and assess capacity gaps			2017	**2,500**
		Organize capacity development on ABS			2018	**1,500**
		Document TKs information			2018	**1,000**
		Monitor and evaluate the implementation status.			2020	

Targets by goals	Indictors	Actions	Implementing Agency		Implement period	Budget (USD)
			Lead	Collaborators		
Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building						
Target 17: By 2015 The Gambia would have adopted , as a policy instrument, and has commenced implementing an effective, participatory and updated NBSAP	5th national report	Submit Fifth National Report on CBD	DPWM	DOF, DOA, Fisheries, MOECCWW, CSOs, NARI, Water Resources, Municipalities and Regional local government , UTG, DLS, NEA, DCD, Women's Bureau, MOFEA	2014 –	
	Revised NBSAP	prepare, validate and submit NBSAP to CBD Secretariat			2015	**4,000**
	Implementation reports	Implement the NBSAP strategy and all associated plans			2015-2020	**60,000**
	CHM portal	Prepare, host and launch a CHM portal for information sharing			2015	**90,000**
	Monitoring and evaluation reports	Implement Monitoring & Evaluation plan			2018-2020	**3,000**
	2nd NBSAP	Review and update 1st NBSAP			2020	**30,000**
Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities and their customary use, are respected.	Study reports	Carry out research and ethno-biological studies to document existing indigenous knowledge, practices and innovations	DPWM	Local government, Local communities, Forestry, TK association, CSOs, DCD, National assembly,	2016	**7,000**
	Legal instrument	Establish and implement legal and other measures to protect, preserve and maintain the indigenous knowledge, innovations and practices			2017-2020	**3,000**
		Ensure Access and benefit sharing				

		Community resource use rights mainstreamed in the management plans				
Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the understanding of consequences of its loss, are improved, widely shared and transferred, and applied	Valuation study reports publication Academic research reports Research report on ABS issues	conduct valuation studies on at least two species and three types of ecosystems	DPWM	UTG, MOFEA, NARI, DOA,TK associations, MEDIA,	2017	**4,000**
		Encourage academic research in Biodiversity issues.			2015-2020	**10,000**
		consolidate information on status, threats, trends and uses of biodiversity and its conservation status, and Biotechnology and ABS related issues through applied research			2015-2020	**4,000**
Target 20: By 2020, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources,, should increase substantially by 35%	Financial plan Board of Trustees meeting reports Invoices & Payment vouchers Project profiles	develop a financing plan	DPWM & MOFEA	MOECCWW, OP, DOF, Fisheries, DNT, Local communities	2015	**3,000**
		Put in place the board of trustees to manage the BTF			2015	**1,000**
		Access funds from the BTF for re-investment into Biodiversity conservation programs			2016 –	
		Develop project profiles for the implementation of the revised NBSAP			2015-2020	**1,000**

ANNEXES

1. COMMUNICATION PLAN

2. CAPACITY BUILDING PLAN

3. TECHNOLOGY TRANSFER

4. RESOURCE MOBILISATION PLAN

5. MONITORING AND EVALUATION PLAN

6. MAPS OF PROTECTED AREAS

ANNEX 6: MAPS OF PROTECTED AREAS

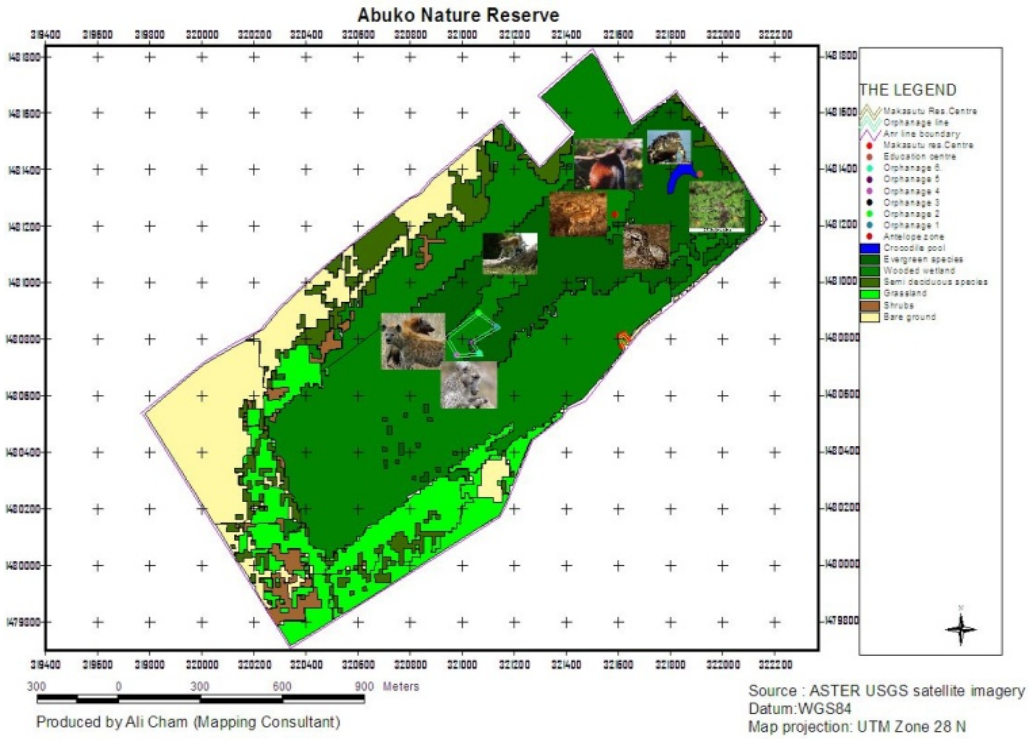


Fig 29: Map of Abuko Nature Reserve

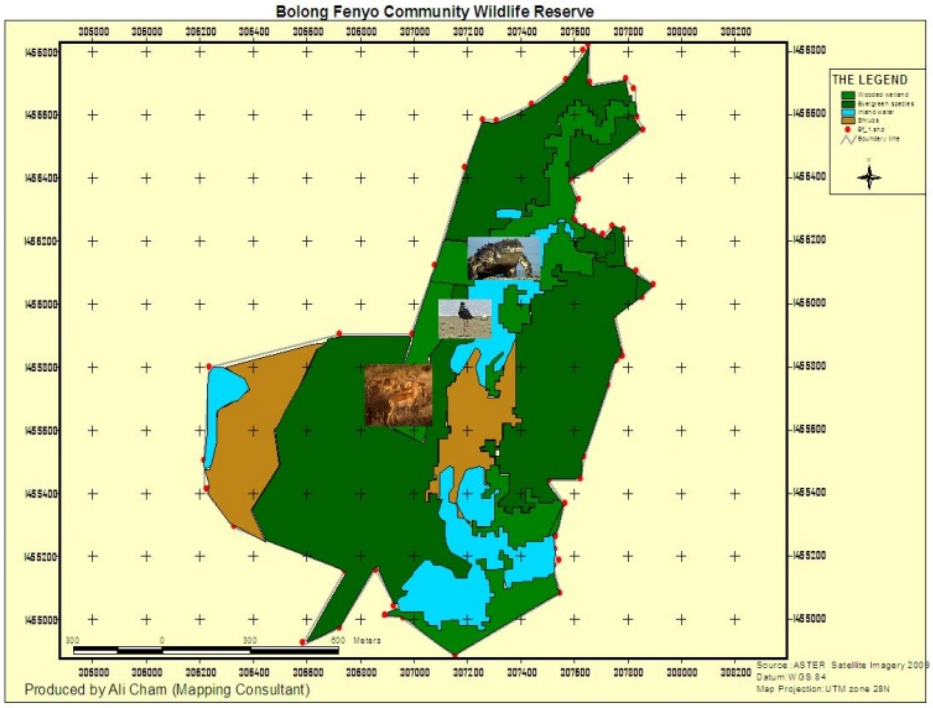


Fig 30: Map of Bolong Fenyo Community Wildlife Reserve

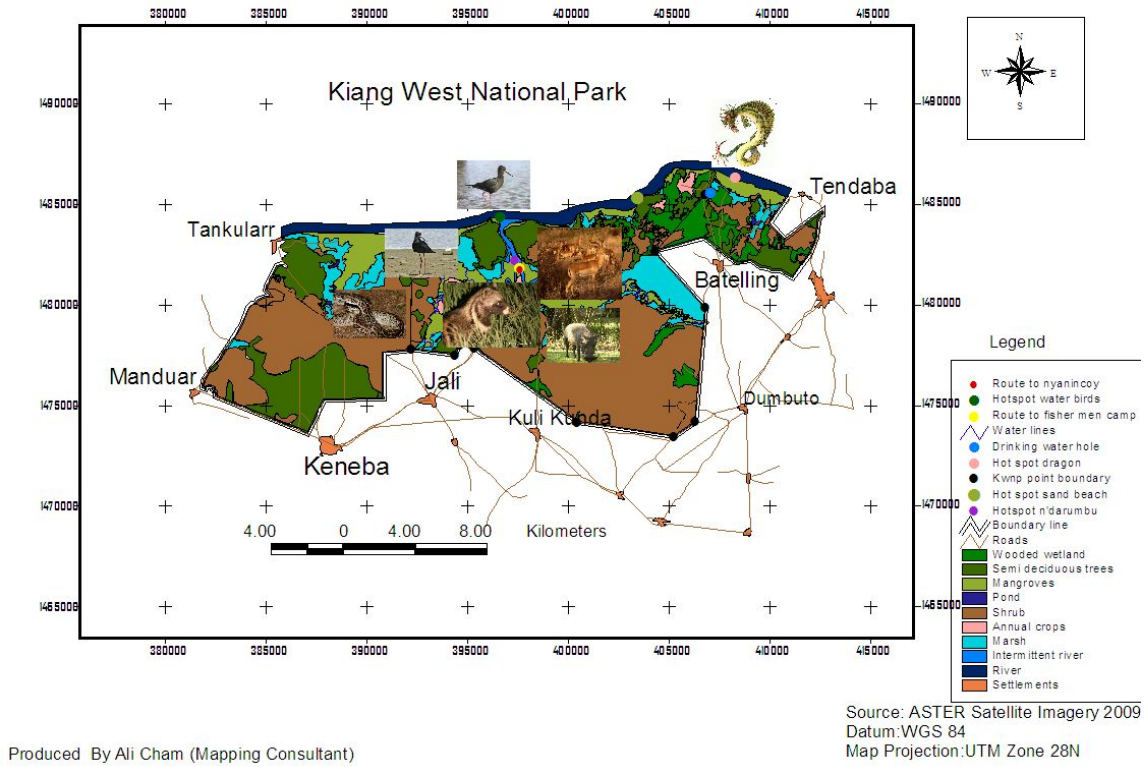


Fig 31: Map of Kiang West National Park

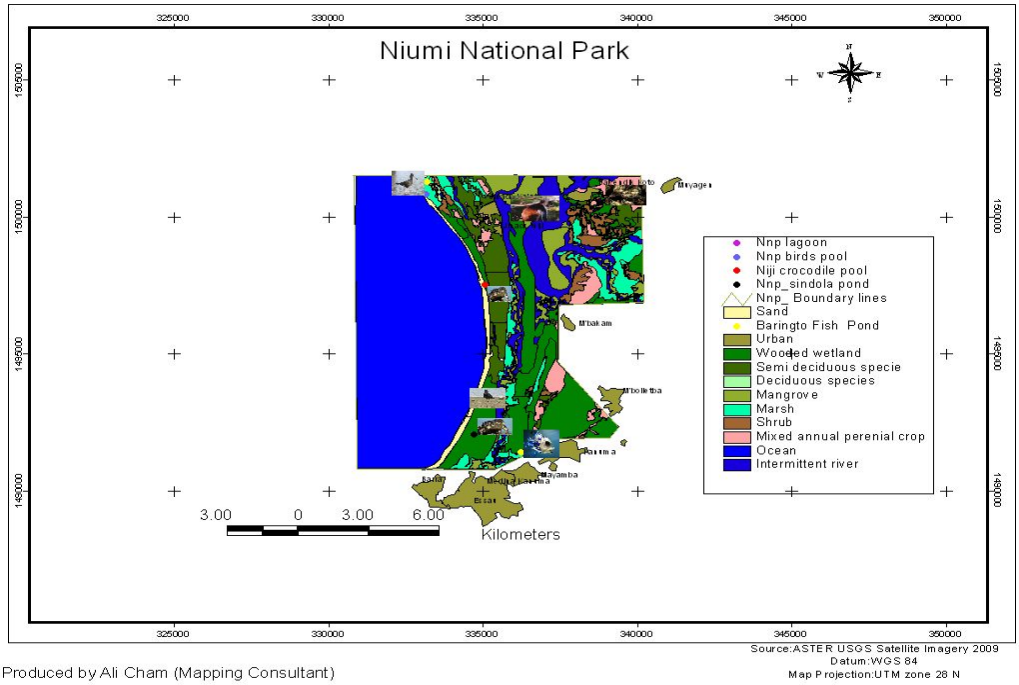


Fig 32: Map of Niumi National Park

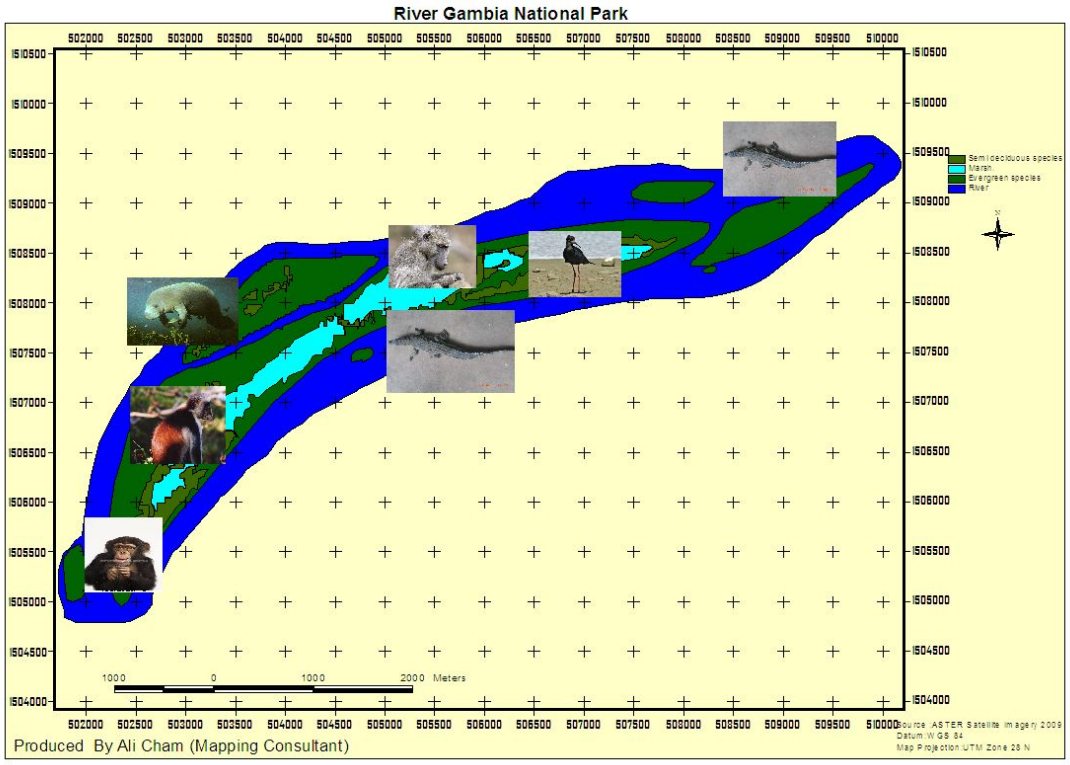


Fig 33: Map of River Gambia National Park

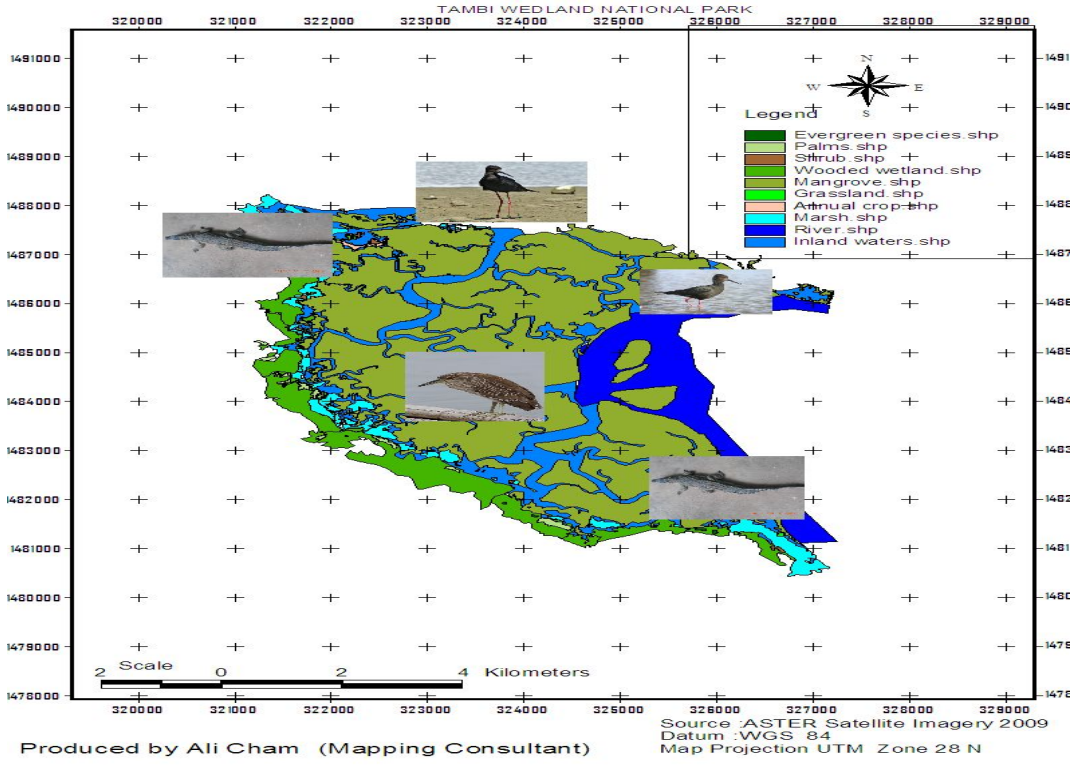


Fig 34: Map of Tanbi Wetland National Park

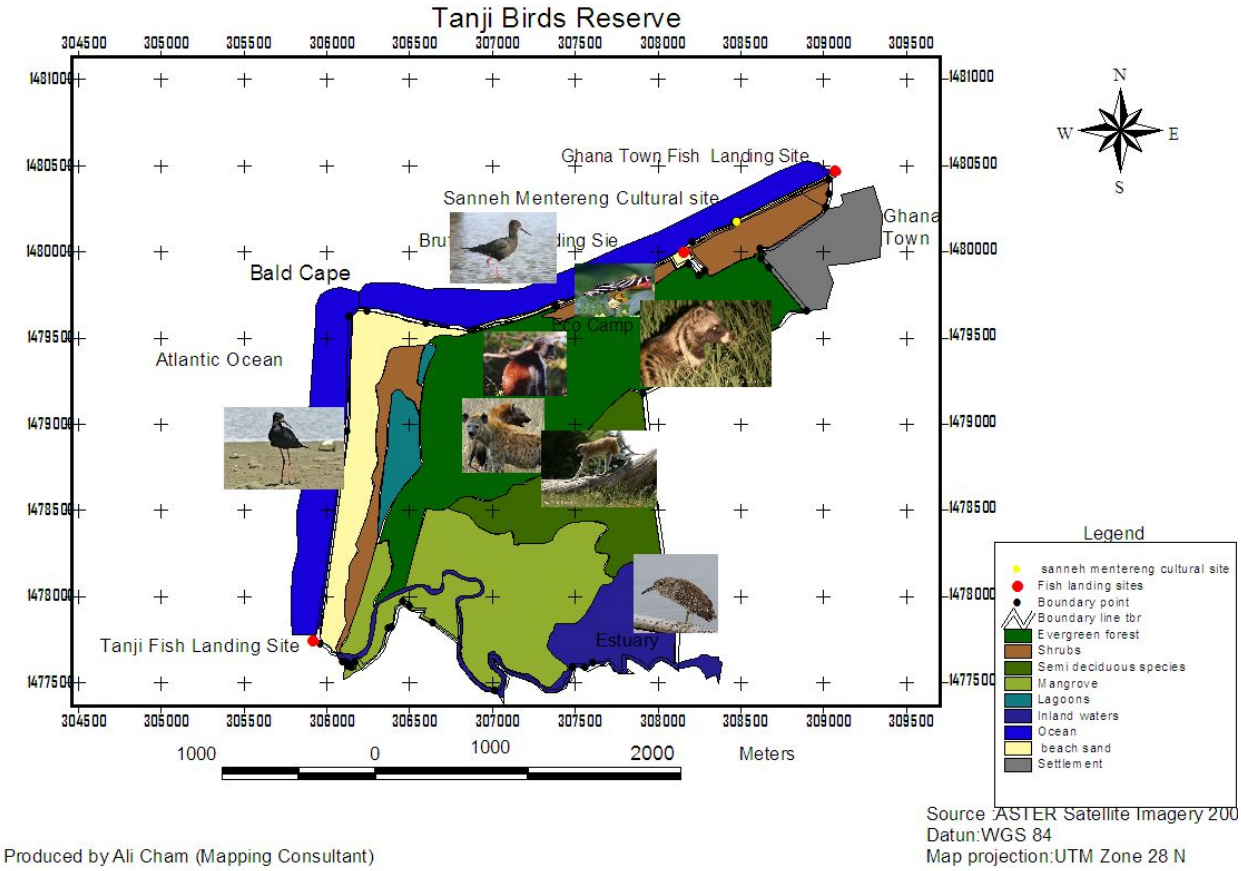


Fig 35: Map of Tanji Bird Reserve

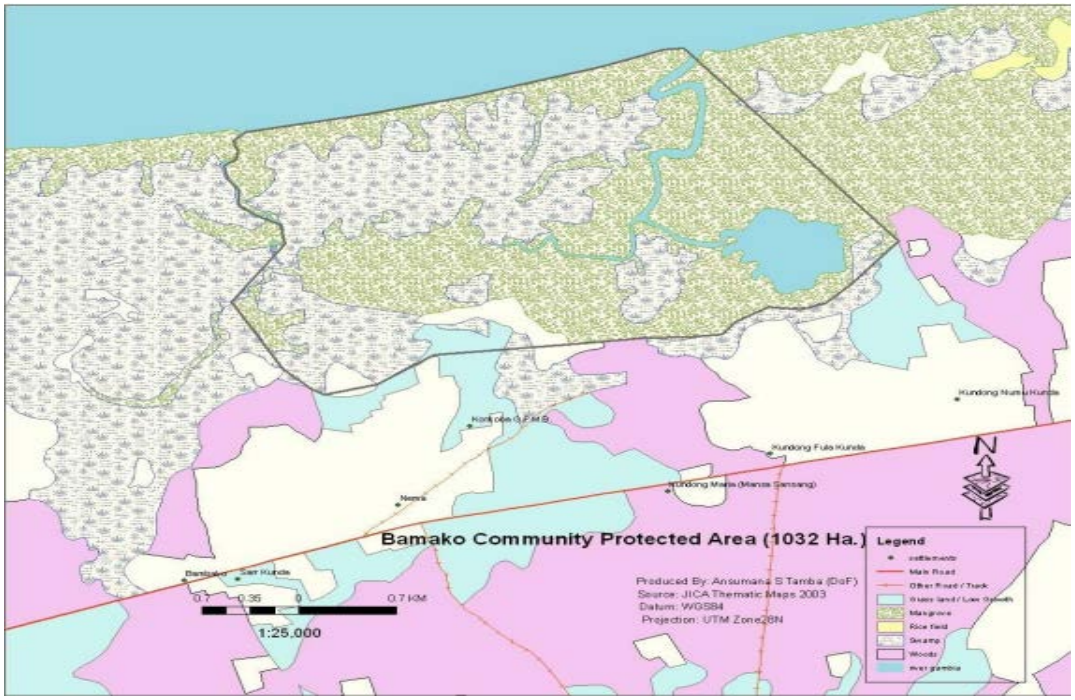


Fig 36: Map of Bambako Community Protected Area

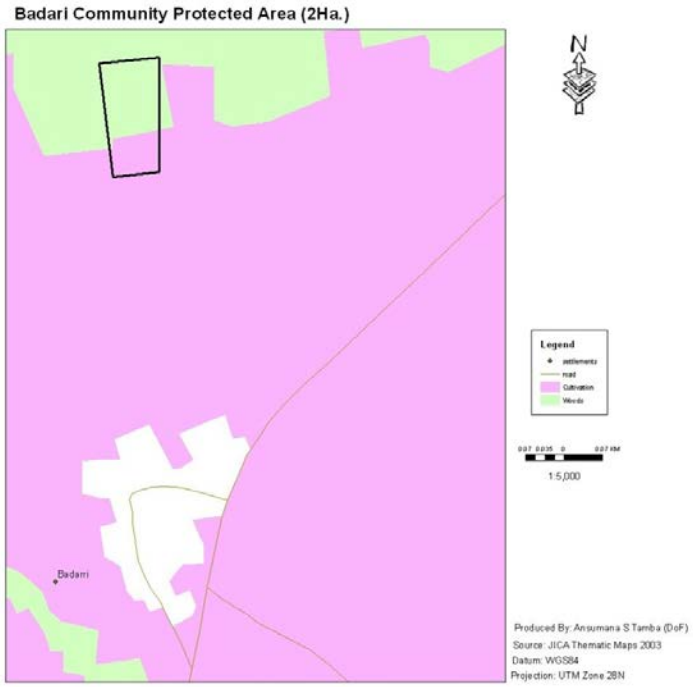


Fig 37: Map of Badari Community Protected Area

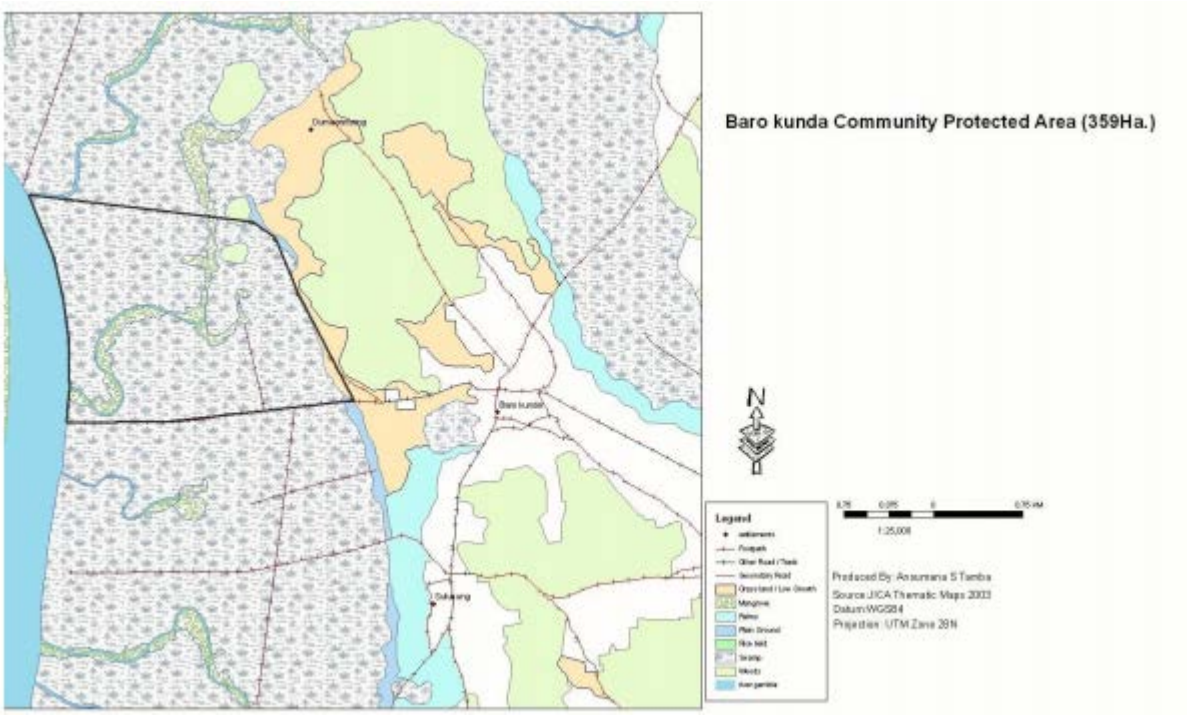


Fig 38: Map of Barrow kunda Community Protected Area

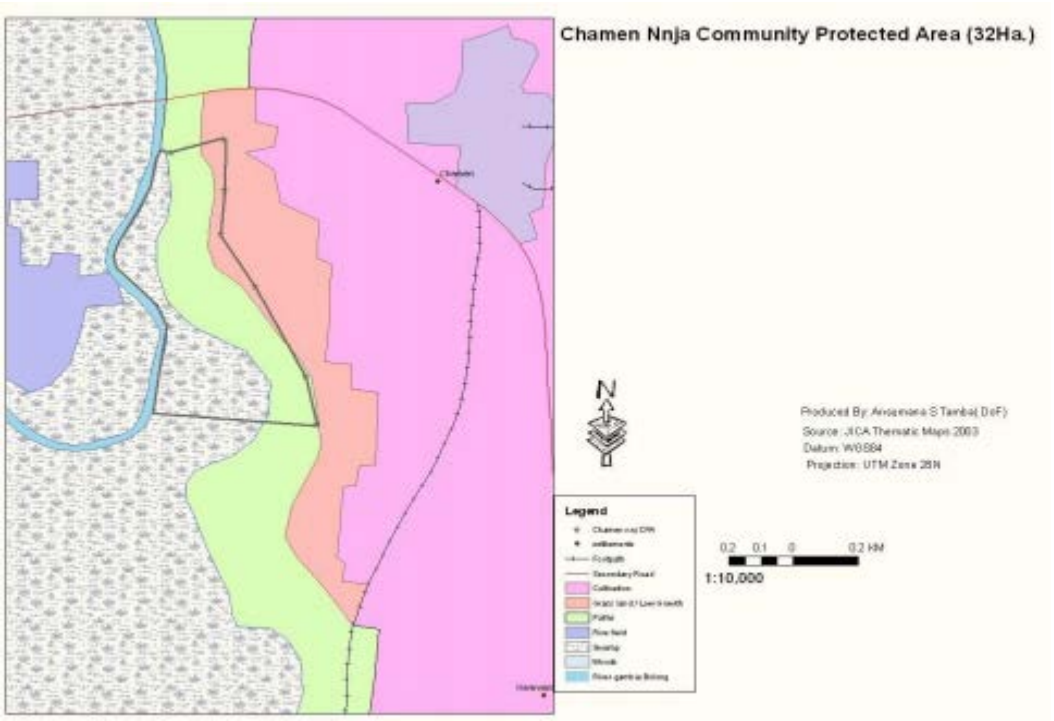


Fig 39: Map of Chamen Community Protected Area

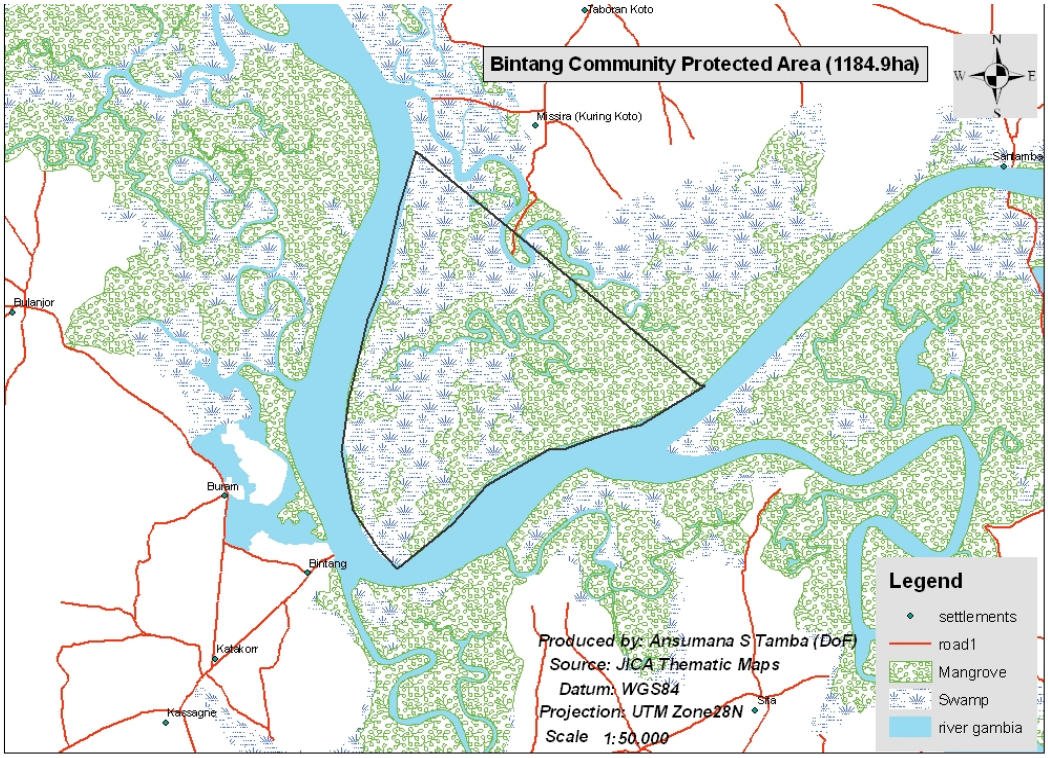


Fig 40: Map of Bintang Community Protected Area

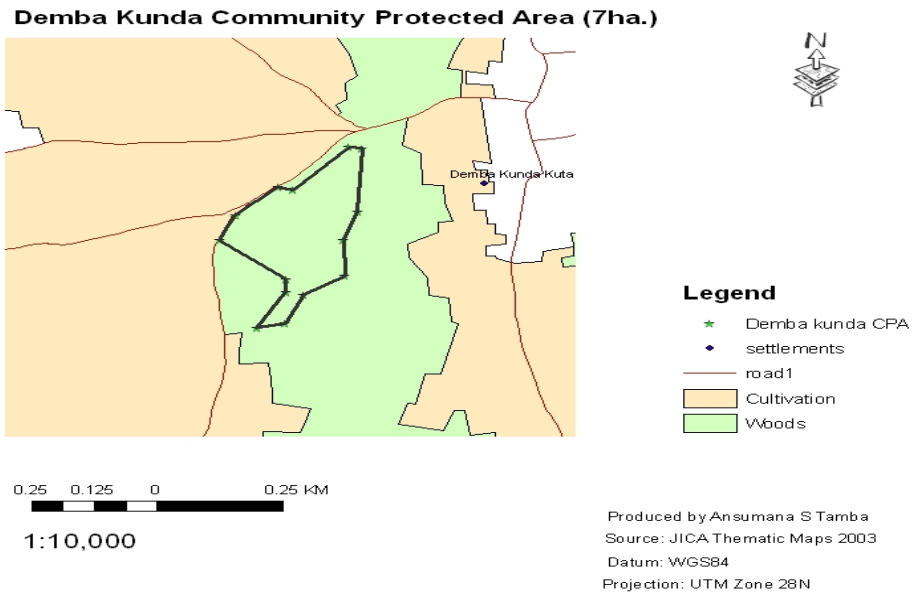


Fig 41: Map of Demba Kunda Community Protected Area

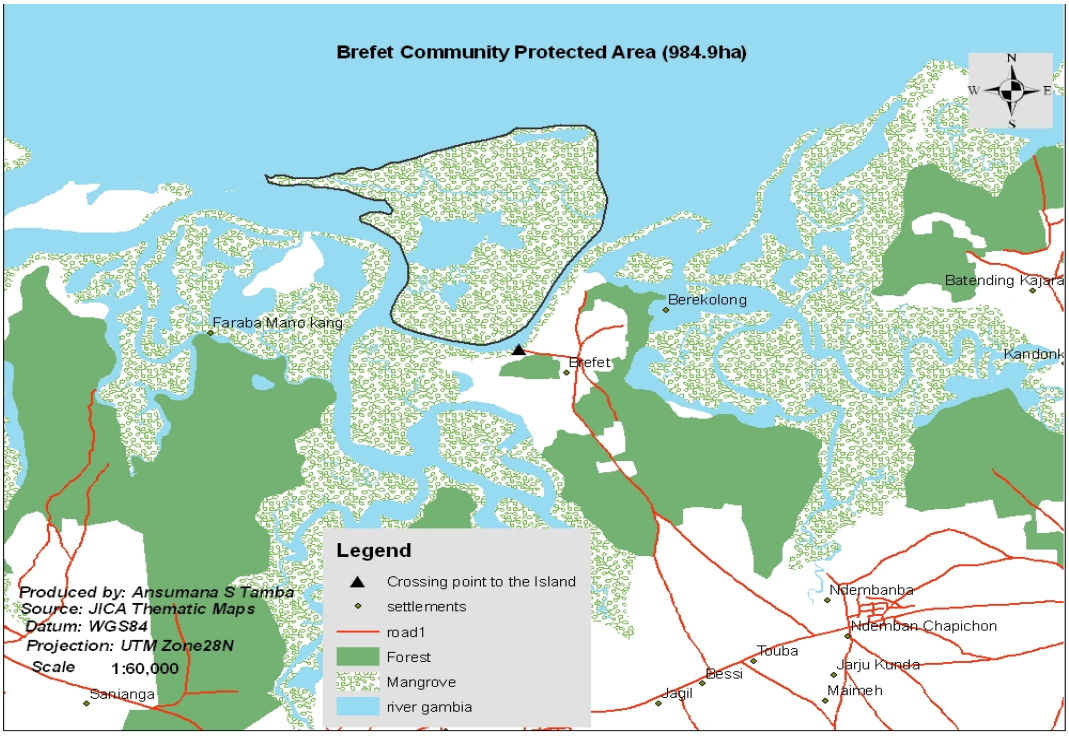


Fig 42: Map of Brefet Community Protected Area

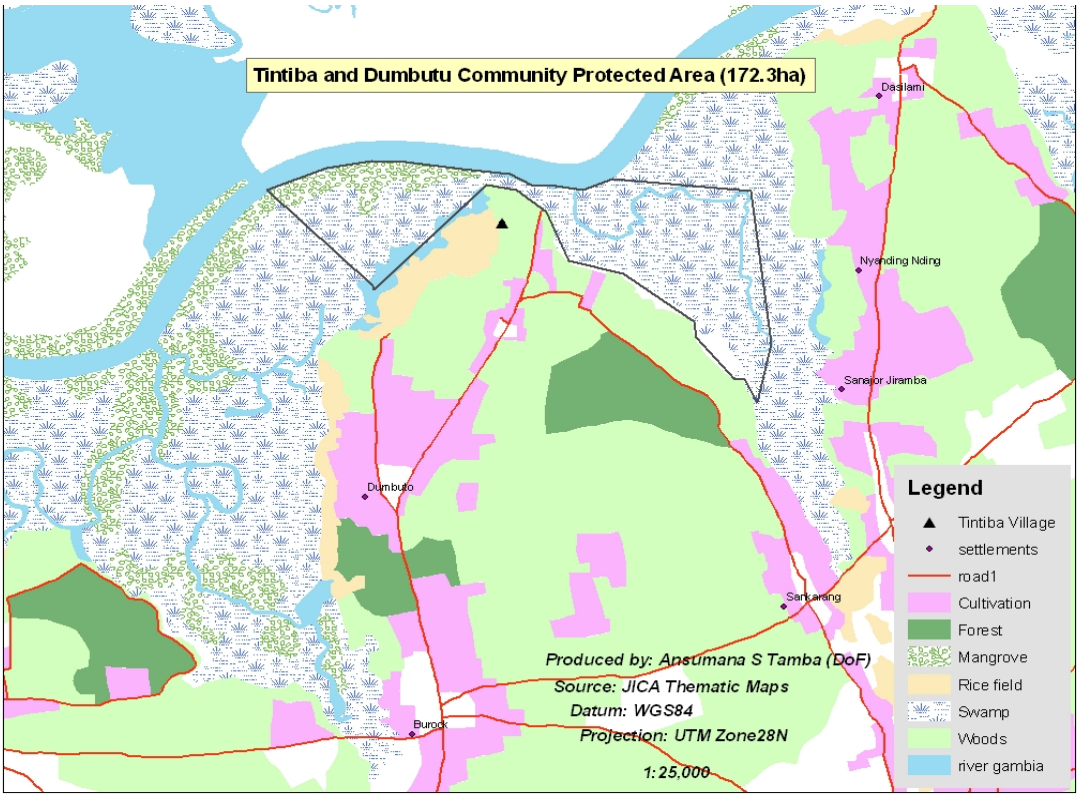


Fig 43: Map of Tintiba and Dumbutu Community Protected Area

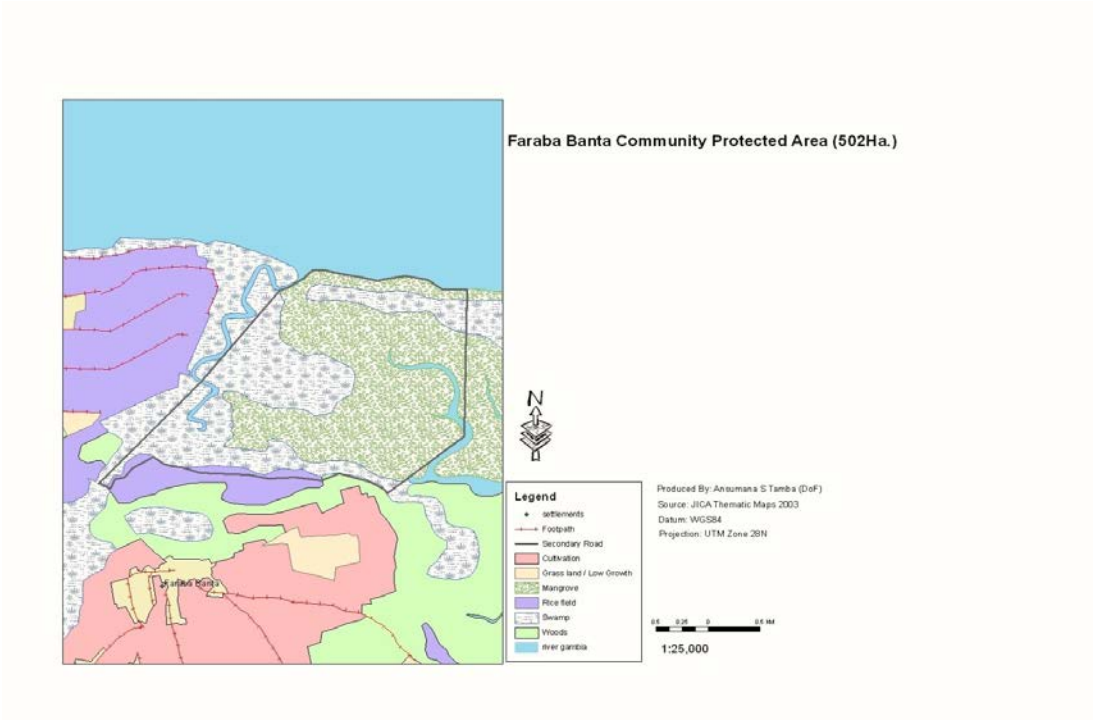


Fig 44: Map of Faraba banta Community Protected Area

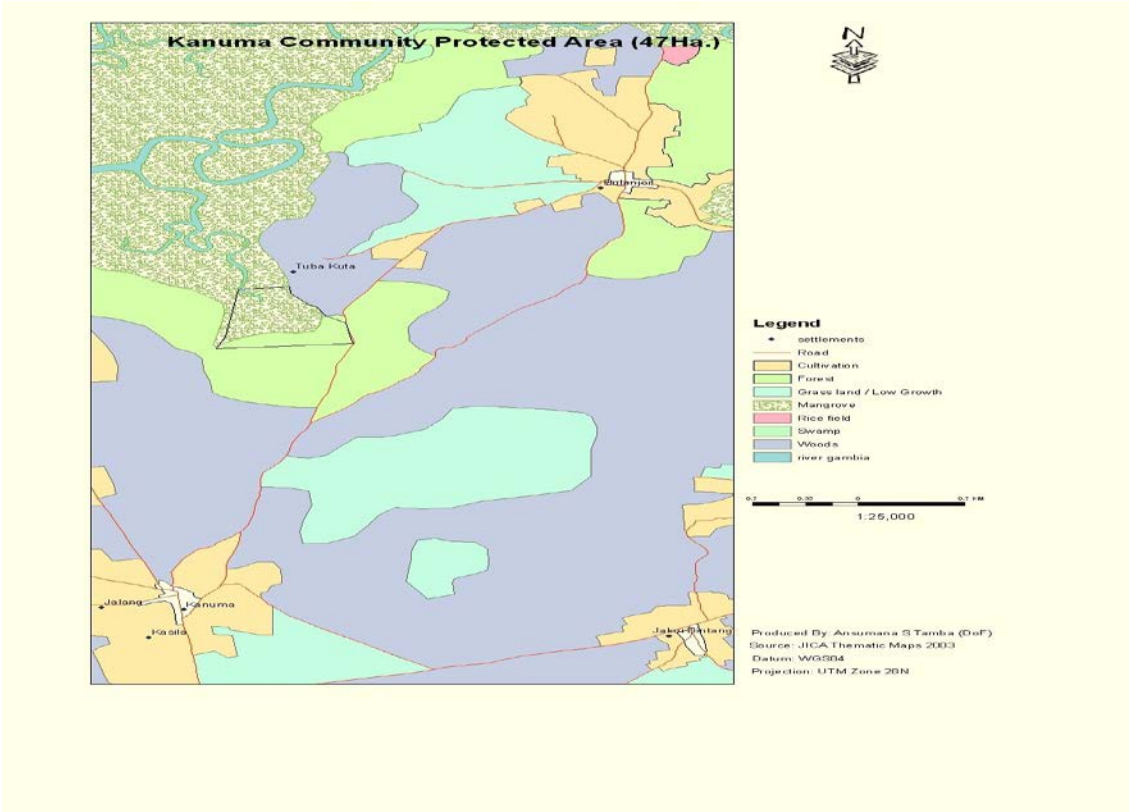


Fig 45: Map of Kanuma Community Protected Area

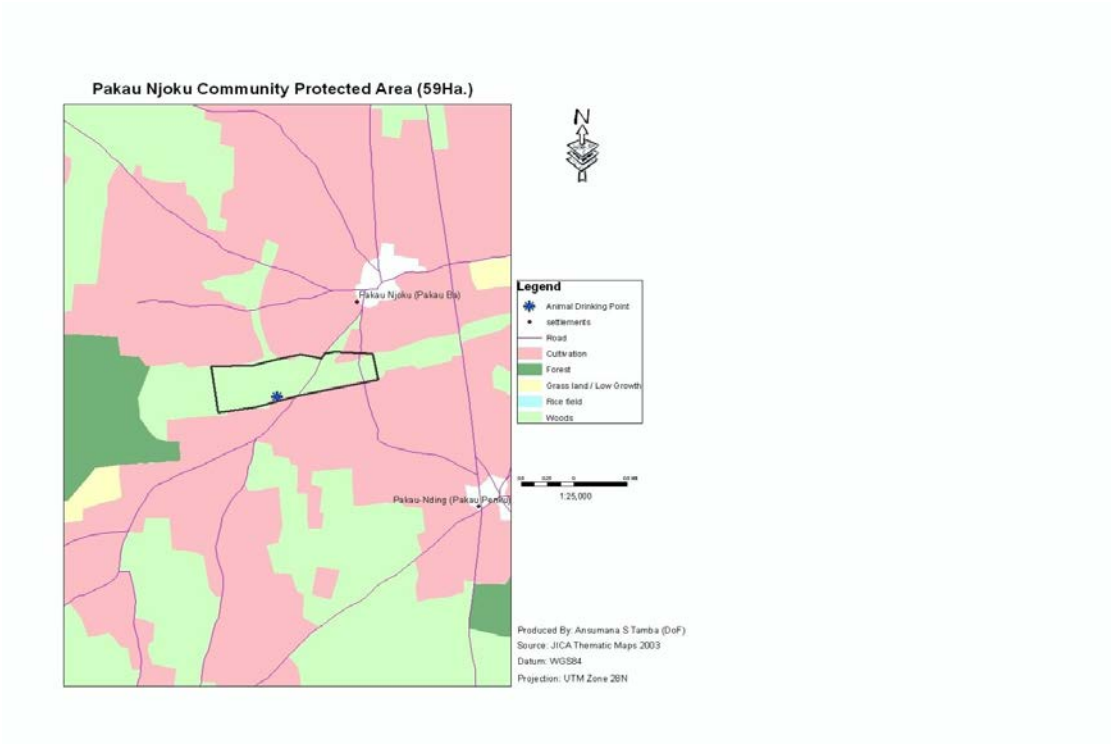


Fig 46: Map of Pakau Njogu Community Protected Area

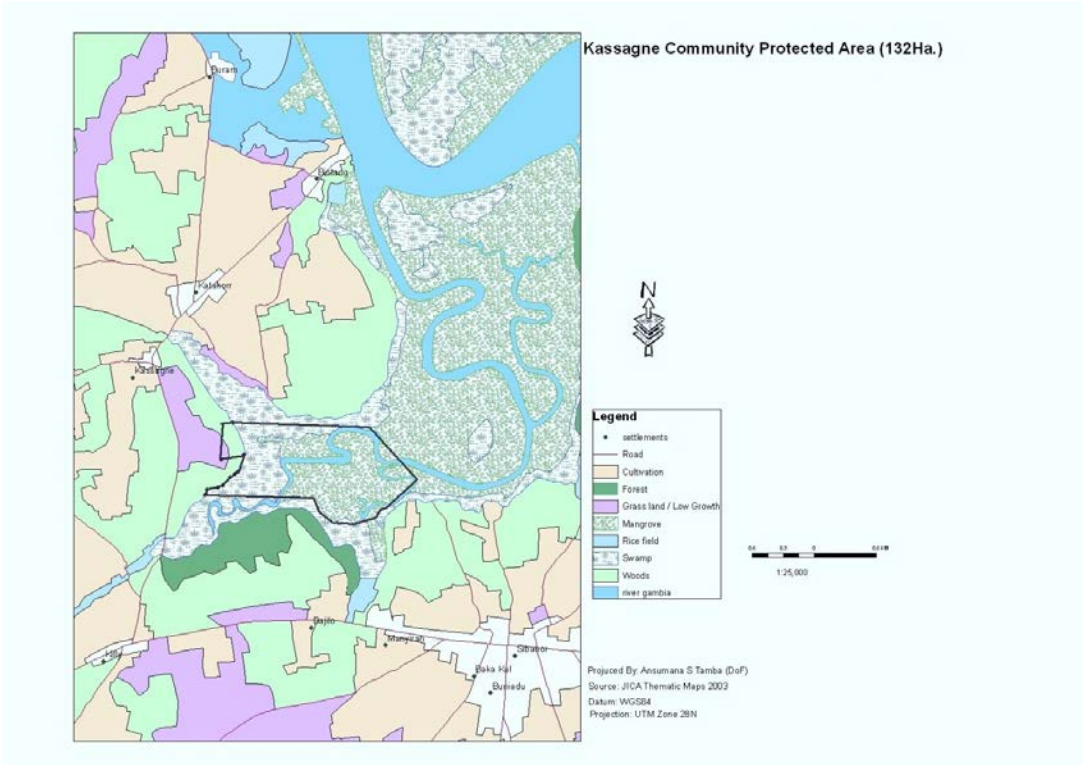


Fig 47: Map of Kassagne Community Protected Area

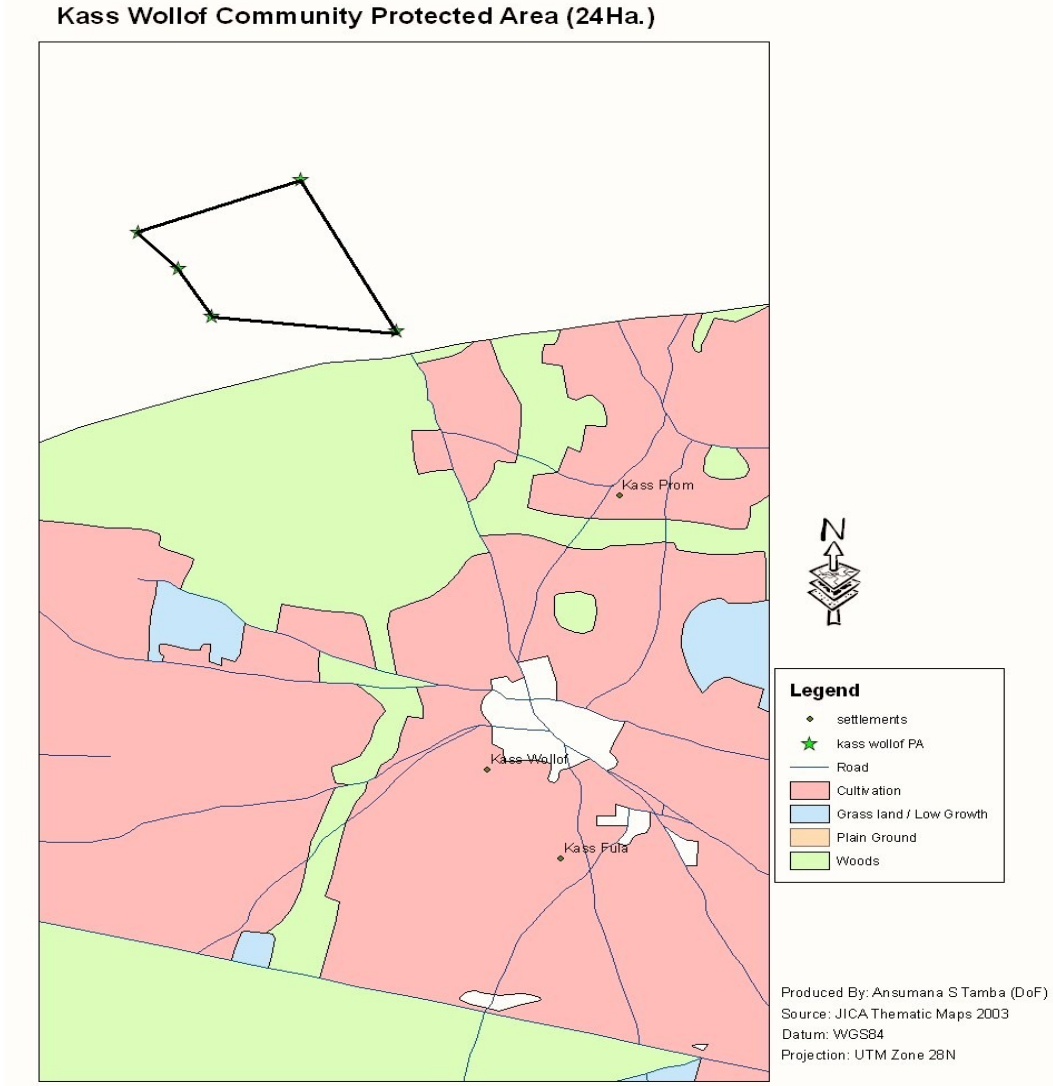


Fig 48: Map of Kass wollof Community Protected Area

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