



GOVERNMENT OF THE GAMBIA

# NATIONAL AGROFORESTRY STRATEGY FOR THE GAMBIA

2022-2032

MINISTRY OF ENVIRONMENT, CLIMATE  
CHANGE AND NATURAL RESOURCES

2022



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Farmers from URR region with the trees they are managing on their farms. In particular, women and youth participation is crucial in promoting inclusivity in agroforestry development and scaling



## The EbA Project: Large-scale Ecosystem-based Adaptation Project in The Gambia

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This publication is the result of widespread consultation of all stakeholders in the natural resource, agriculture, and forestry sectors at local, regional and national levels in the Gambia.

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## FORWARD / PREFACE

Increased rates of degradation in the Gambia poses major economic and environmental challenges in the country. Already, the country is ranked among countries facing high exposure and vulnerability to climatic and non-climatic factors, calling for urgent integrated and cross cutting solutions. Agroforestry is a nature-based solution that if well practiced can achieve multiple social, environmental, and economic benefits to the country. It involved intentional integration of trees and shrubs within the crops and pasture lands with an aim to improve farm level productivity and profitability.



With additional benefits including improved community livelihood, increased climate change resilience, increased food security and improved environmental functionality, agroforestry practices are among the top ranked solutions to addressing numerous challenges that the country is currently facing. The country has numerous opportunities to integrate different forms of agroforestry in different landscapes depending on the community preferences and applicability in different contexts.

This strategy was produced by World Agroforestry (ICRAF) through the Large-scale ecosystem-based adaptation in The Gambia: Developing a climate resilient, natural resources-based economy (EbA Project) funded by the Green Climate Fund (GCF) and implemented by the Government of The Gambia with the support of United Nations Environmental Programme (UNEP). The overall goal of the project is to build a climate-resilient natural resource base for communities in different regions. Development of this national strategy is a major milestone to both the project and country at large as it lays a firm foundation upon which agroforestry practices can be scaled and mainstreamed in the country. It gives a basic understanding of agroforestry, its evolution, potentials, and the policies and strategies related to agroforestry.

The process of developing this strategy involved a national wide consultation involving local community groups and representatives, local and national non-government organizations, farmer groups, research and academia institutions, representatives from regional and national governments, and development sector. Over 134 stakeholders were consulted in the process to share their experiences and recommendations on the strategy through focus group discussions and written submissions. The strategy will play a crucial role in transforming different sectors in the nation, mainly agricultural and forestry sector.

### **Hon. Rohey John Manjang**

Minister of Environment, Climate Change and Natural Resources  
The Gambia.



## ACKNOWLEDGEMENT

The Agroforestry Strategy for The Gambia (2022-2032) was developed through a consultative and participatory process involving various stakeholders drawn from the government and its agents, the private sector, community groups, research, academia, among other sectors. We appreciate the constructive feedback that we received in the development of this document from representatives of these organizations and the wider audiences from communities, donors, and multilateral organizations operating in the country.

The strategy development was led by the World Agroforestry (ICRAF) as an output of the project, 'Large-Scale Ecosystem-Based Adaptation in The Gambia: Developing a Climate Resilient, Natural Resource-Based Economy' (EbA Project). The project was launched in The Gambia in 2017, with funding from the Green Climate Fund (GCF), through the United Nations Environment Program (UNEP) as the Accredited Entity (AE) and the Ministry of Environment, Climate Change and Natural Resources (MECCNAR) as the Executing Entity (EE). The overall goal of the project is to build a climate-resilient natural resource base for communities across three intervention regions of The Gambia -Lower River Region (LRR), Upper River Region (URR) and Central River Region (CRR) - North and South. Among the targets of the project is to restore 7,000ha and 3,000 ha of degraded forests and agricultural lands respectively, which creates a unique opportunity for agroforestry development and scaling in both landscapes.

We appreciate the support we received from the Project Management Unit (PMU) staff, project regional coordinators, government departments, as well as local communities who will be the beneficiaries of this strategy. We also appreciate diverse stakeholders representing different thematic areas and sectors for their constructive feedback that improved the quality of this strategy.

## ACRONYMS / ABBREVIATIONS

ANR	Assisted Natural Regeneration
CRR	Central River Region of The Gambia
EbA	Ecosystem-Based Adaptation
EbA Project	Large-Scale Ecosystem-Based Adaptation in The Gambia: Developing a Climate Resilient, Natural Resource-Based Economy'
ECOWAS	Economic Community of West African States
GBoS	The Gambia Bureau of Statistics
GCF	Green Climate Fund
GDP	Gross Domestic Product
GMD	The Gambian Dalasi
ICRAF	International Centre for Research in Agroforestry (World Agroforestry)
LRR	Lower River Region of The Gambia
MA&D	Market Analysis and Development approach
MECCNAR	Ministry of Environment, Climate Change, and Natural Resources
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NARI	National Agricultural Research Institute
NBR	North Bank Region of The Gambia
NDC	Nationally Determined Contributions
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
URR	Upper River Region of The Gambia
USD	United States Dollar
WCR	West Coast Region of The Gambia

## GLOSSARY / DEFINITIONS

<b>Agroforestry</b>	<p>A collective name for land-use systems and practices whereby woody perennials are deliberately integrated with crops and/or animals within the same land management unit, either in a spatial or temporal sequence (Leahey, 1996; 2017).</p>
<b>Assisted Natural Regeneration</b>	<p>This is a simplified and flexible restoration option for de-vegetated and degraded landscapes through removing or reducing barriers (such as competition, wildfires, overgrazing and overharvesting) to accelerate natural trees regeneration (Shono et al., 2007)</p>
<b>Ecosystem-Based Adaptation</b>	<p>These are system-wide approaches that incorporate biodiversity and ecosystem services as part of a broader adaptation strategy, considering the interplay between people, policies, and institutions (see IUCN <a href="#">EbA</a>; Muthee et al, 2021).</p>
<b>Gross Domestic Product</b>	<p>The sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products (see <a href="#">World Bank</a>).</p>
<b>Market Analysis and Development approach</b>	<p>Market Analysis and Development (MA&amp;D) approach is to assist individuals living in rural communities to develop enterprises to generate and improve their incomes while ensuring the sustainable management of forest resources (see FAO Guide on <a href="#">MA&amp;D</a>)</p>
<b>National Adaptation Programme of Action</b>	<p>NAPAs provide a process for the LDCs to identify priority activities that respond to their urgent and immediate needs concerning adaptation to climate change - those needs for which further delay could increase vulnerability or lead to increased costs at a later stage (See UNFCCC <a href="#">NAPA</a>)</p>
<b>Nationally Determined Contributions</b>	<p>Nationally Determined Contribution is a climate action plan to cut emissions and adapt to climate impacts. Each Party to the Paris Agreement is required to establish an NDC and update it every five years (see UNFCCC <a href="#">NDC</a>).</p>



## EXECUTIVE SUMMARY

In The Gambia, climatic and non-climatic stressors continue impacting principal ecosystems which are mainly agricultural lands and forests, contributing to high rates of de-vegetation and degradation. The communities rely on crop and livestock husbandry for their livelihoods, with agriculture supporting 26% of the GDP, employing 45% of the population, and accounting for 20-30% of total landcover. However, productivity continues to be low due to human and non-human activities, necessitating urgent actions to reverse the trend in the wake a of changing climate.

Agroforestry, which involves incorporating woody perennials (trees) into the agricultural lands and forests, continues to receive global attention due to its multiple and cross benefits to sectors such as agriculture and pastoralism, with additional benefits towards resilient livelihoods and landscapes.

The Agroforestry Strategy for The Gambia (2022-2032) aims to create an enabling environment for agroforestry adoption through policy mainstreaming and coordination, knowledge creation and management, strengthening of markets and incentives systems, and embedding inclusive governance that is representative of the voices and interests of all.

The strategy was developed through an inclusive and participatory process from both state and non-state actors, community leaders, the private sector, and research and academic institutions. It is divided into six chapters.

Chapter One provides a general look at agroforestry through broadly defining it, how it has evolved and its potential for rural development, noting that most of agroforestry practices takes place within the rural set up. The chapter also explores how agroforestry practices can promote livelihoods and ecosystems adaptation in critical sectors such as agriculture and pastoralism, in addition to enhancing climate resilience in different landscapes.

Chapter Two focusses on the vision, mission, goals, and principles of the strategy. The overall goal of the strategy is to present strategic guidance to promote agroforestry interventions as a pathway to address land degradation, food insecurity, and vulnerability of the agricultural systems to climate change effects in The Gambia. The specific objectives of the strategy are::

1. To establish a policy and institutional basis for the wider promotion and adoption of agroforestry in The Gambia.
2. To enhance coordination in agroforestry programmatic designs and implementation to promote institutional collaboration and technical backstopping.
3. To promote agroforestry knowledge creation, dissemination, adoption and monitoring for effective adoption of context-appropriate agroforestry practices at scale.
4. To devise incentive and investment mechanisms for agroforestry through wood and non-wood-based value chains promotion
5. To create an enabling environment for inclusive participation of all stakeholders in agroforestry promotion and the associated value chains.

### **The key principles guiding the strategy are:**

1. The multi-institutional nature of agroforestry should be appreciated
2. The multisectoral nature of agroforestry should be considered in the promotion of any agroforestry practices.
3. Agroforestry promotion should be context specific, bearing in mind local climatic conditions as well as the socio-economic realities.
4. Agroforestry, depending on the designs, could be a complex practice.
5. Agroforestry designs should consider inclusive approaches to address the needs and concerns of diverse stakeholders.
6. Partnerships and collaborations play a fundamental role in promoting agroforestry.
7. The design and promotion of agroforestry should align with national and local priority/needs

Chapter Three focuses on the policies, strategies and potential markets for agroforestry products. Some of the reviewed policies and strategies include the 1997 Constitution of the Republic of the Gambia, multilateral environment agreements and treaties such as CBD, CITES and NBSAP where the Gambia is a signatory, and national policies including Forestry Policy (2021-2030), The Gambia ANR policy (2017-2026), Gambia NDC, and National Climate Change Policy of The Gambia. It also looks at the associated economic, environmental and social benefits of agroforestry, preferred agroforestry practices and tree species, as well as potentials and challenges of agroforestry systems development. The chapter also reviews agroforestry related value chains including timber and non-timber forest products.

Chapter Four of the document takes a closer look at the enabling institutional context for the strategy implementation, highlighting different institutions, their roles and relevance to the agroforestry strategy promotion, including government ministries, departments and national agencies. It also explores the enabling environment such as capacity building, business support, gender and social inclusion, and partnership development.

Chapter Five proposes the implementation framework for the strategy through identifying the responsible institutions and their key action areas and responsibilities based on their mandates. The chapter also identifies areas for agroforestry mainstreaming to enhance wide adoption in different sectors.

Chapter Six presents a monitoring, evaluation and reporting mechanism for the strategy. It identifies the parties that need monitoring information, what information they need, why they need it and in which form. The chapter establishes that agroforestry monitoring system should feature a community-driven design that captures biophysical, socio-cultural, and economic status and impacts that are specific to The Gambian context. The chapter also identifies tools, methods and protocols for monitoring agroforestry, and concludes by proposing a monitoring and evaluation framework for the strategy.

In conclusion, the national agroforestry strategy for the Gambia is a major landmark document in the development and scaling of agroforestry practices in the Gambia. It calls for mainstreaming in the national policies and institutional frameworks to ensure maximum benefits through improved landscapes and livelihoods across the country.

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# INTRODUCTION



# CHAPTER ONE

## INTRODUCTION

### 1.0 Background information

#### 1.1 Defining agroforestry, its evolution, and its potential for rural development

Different studies and institutions have defined agroforestry in various ways. Nair (1984) defined agroforestry as a system where woody perennials are deliberately mixed or retained with crop or animal production units. Broadly, the systems involve growing trees and shrubs in agricultural land (Agrisilviculture), pastureland (Silvopastoral), or mixed-use land (agrosilvopastoral). According to Leakey (1996), ICRAF adopted a simple definition of agroforestry as *'agriculture with tree'* and a more complex definition *'as a collective name for land-use systems and practices whereby woody perennials are deliberately integrated with crops and/or animals within the same land management unit, either is a spatial or temporal sequence'*. The patterns adopted may either be sequential (e.g., fallows) or simultaneous (e.g., alley-cropping). Leakey (2017) further expounded the definition, looking at agroforestry as *'adynamic, ecologically based, natural resource management systems that, through the integration of trees in farm and rangelands, diversifies and sustains smallholders' production for increased social, economic, and environmental benefits*. From these definitions, agroforestry systems should include land, trees, crops, and non-trees components in different arrangements. Nair (1993) establishes the key attributes of agroforestry to include: a) productivity (improved yields of associated crops and ecosystems services related to trees); b) sustainability (long-term benefits to livelihoods and ecosystems); and c) adaptability (acceptability and scalability in different scales and contexts).

Agroforestry as a practice and concept has evolved in three distinct phases since its inception. The first era was before 1970s and is viewed as the era of traditional agroforestry development largely characterized by trees at the plot and farm levels. Some of the traditional agroforestry systems that were common between the 5<sup>th</sup> and 18<sup>th</sup> Centuries included slash and burn, shifting cultivation, and forest farming. In such systems, valuable trees were either planted or spared during the agricultural intensification process to play their social, economic, and environmental roles, largely defined by the levels of knowledge and existing social-cultural structures (King, 1987). Towards the 19<sup>th</sup> century, there was a shift from traditional to more modern systems such as Tuangya and shamba systems. Another important development was the shift towards agroforestry concept development and institutionalization that moved agroforestry to landscape and livelihood scales between the 1970s and 1980s. Stepler and Nair (1987) define the period between 1977 to 1987 as the decade of agroforestry research and concept development and institutionalization. During the period, the International Council for Research in Agroforestry (ICRAF), currently the World Agroforestry was established in 1978, focusing largely on agroforestry in Africa and Asia, while the Center for Research and Higher Education in Tropical Agriculture (CATIE) was established focusing mainly on agroforestry in Latin America. The institutionalization process of agroforestry also saw its mainstreaming in national law and policy frameworks to marry agriculture with forestry. Agroforestry is currently in the era of governance, research, science, and policy mainstreaming globally. The technologies in place are complex, multidisciplinary, and interdependent, moving from

local to global scales and policies (van Noordwijk, 2019). To illustrate, agroforestry is cited in over 85% of National Determined Contributions – NDCs (Duguma et al., 2017) as a pathway to meet countries' conditional and unconditional greenhouse reduction commitments. The Gambian NDC points out multistrata agroforestry and firewood from agroforestry as pathways to meeting its national mitigation potential. Agroforestry is also featured in the country-specific National Adaptation Plans (NAPs) and National Adaptation Programmes of Action (NAPAs). The Gambian NAPA establishes agroforestry as a key adaptation and mitigation pathway in the agricultural and forestry sectors, with a proposal for agroforestry and reforestation activities expansion in almost all regions across the country.

Rural development remains key in many countries, noting that an estimated 3.4 billion people (45% of the global population) live in rural areas in developing countries. In The Gambia, over 40% of the population lives in the rural area, with most of the population living below the international poverty line of USD 1.25 daily, and the national poverty incidence level estimated at 48% (Economic Commission for Africa, 2017). There are several distinct areas where agroforestry can promote rural development in The Gambia. These includes diversification of livelihood avenues in rural areas, cushioning farmers from extreme weather conditions that affects their farm productivity, and meeting household food and energy needs. Using the Millennium Ecosystem Assessment (2005) as a reference, some of the ecosystem services related to agroforestry include provisioning (e.g., food, fuel, and fodder), regulatory (e.g., pollination, climate, and water regulation), supporting (e.g., soil formation and nutrient cycling), and cultural (e.g., recreation, tourism and recreational services). From an economic perspective, agroforestry can support building livelihood assets in rural Gambia. Some of the critical types of livelihood assets that agroforestry can build include human, physical, natural, financial, and social capital (Carloni, 2005), which can cushion communities from the adverse effects of climate change. Generally, agroforestry meets the economic needs of the communities through increased farm profitability, employment generation, and livelihood diversification in rural areas.

## **1.2 Benefits and roles of agroforestry in The Gambia's agriculture sector**

Agriculture in The Gambia contributes about 26% of the Gross Domestic Product (GDP), employing 45% of the population, and accounts for 20-30% of total landcover (Duguma et al. 2020). Agroforestry technologies can benefit the sector differently depending on the context in which they are developed. For example, the development of alley cropping where trees and shrubs are integrated with farm crops can provide multiple benefits, including reducing surface water runoff and erosion, enhanced food productivity through micro-climate regulation, and improved soil and nutrient quality. Hence, alley cropping can be beneficial both to ecosystems functioning and supporting livelihoods. Agroforestry technology such as silvopasture development, where trees are combined with pasture and livestock production, can play an important role in supporting livestock sector development, provision of feed and fodder to animals, income diversification to the farmers, and controlling erosion. The establishment of windbreaks and shelterbelt systems around the farms and homesteads is critical in controlling wind erosion. In countries such as The Gambia that are highly exposed to wind erosion, developing agroforestry technology can promote soil conservation, protect wind-sensitive crops, and serve as farm windbreaks, thereby boosting farm productivity. Some of the potential

windbreak systems that can be scaled out include cashew agroforestry which can also serve as a firebreak during dry seasons. In addition, windbreak agroforestry can also offer protection to the farms from free-range and transhumant animals to ensure that crops survive until they are harvested. Agroforestry can improve rural living and livelihoods through both food and income diversification as well as improving meeting the nutritional needs of households and communities to improve their health. It also promotes gender equality and empowerment especially for women who play a key role in meeting the household nutritional needs.

### **1.3 Pastoralism and Agroforestry: The interdependencies**

Livestock management is an integral element of the livelihood in The Gambia. Most of the communities are agropastoral, if not more pastoral in the real sense. Thus, local and cross-country transhumance is a prominent feature of the livelihood system. Two main factors drive transhumance (movement of livestock locally and cross-country) – water and feed. Trees in the community forests, forest reserves, community-managed rangelands, and private lands have been the main feed source during the transhumance period. The Gambian farmers even sell their trees to transhumant people coming from other locations, making trees a lucrative resource to get the money during the harsh dry season. And for the animals, it is also a means of surviving the drought period. As Bah et al (2021) described, there is a considerable potential to develop fodder-based systems (one form of agroforestry) to enhance the resilience of the livestock to drought and feed shortage.

Nonetheless, transhumance, as described in Bah et al (2021), also has become a major impediment to the survival of the trees and seedlings. To illustrate, animal movement causes trampling and destruction of seedlings and saplings affecting tree growth, increases land degradation as the fertile soils are blown away by wind, and contributes to spread of invasive species. Nonetheless, agroforestry provides an opportunity for increasing feeds and fodder to animals to reduce the tradeoffs associated with transhumance.

### **1.4 Agroforestry and the path to climate-resilient carbon-rich landscapes**

The Gambia's economy is highly vulnerable to climate change impacts. Agriculture, which contributes close to 40% of the national export and employs close to 68% of the active labor force (Duguma et al., 2020) faces serious challenges and an uncertain future due to climate change impacts. More than half of the country's agricultural production is cereals which are very dependent on rainfall. Cash crops (mostly groundnut and sesame) occupy about 48% of the agricultural land in the country.

Changes in ecosystems that provide goods and services are also posing their challenges. For instance, the woodland ecosystem which supports most of the pastoral communities and generates wood and non-wood products for the community has shrunk significantly – from 80% of the land area in the 1940s to about 42% in 2001. The degradation trend has continued, and the ongoing changes are affecting the land cover that used to provide goods and services that contributed to the adaptation potential. The ongoing deforestation leads to changing local microclimatic conditions through loss of biodiversity. Such changes increase the level of vulnerability of the community to climate change impacts.

Today, The Gambia has limited closed forest existing except for some patches in the protected areas, riverine (mangroves and other species) and other remote parts of the country. A large part of the disappearance of the closed forest is due to the increase in cultivated areas of the country and is linked to shrinking fallow periods and decreasing fertility of soils used for producing food. Of the remaining woodland area, 78% is considered a degraded forest and savannah. The major drivers of deforestation and forest degradation include unplanned urbanization, unsustainable agricultural practices, the extraction of firewood and charcoal for energy use, the extraction of wood for construction/export, and the making of household furniture that is both used at home and sold on the market.

With The Gambian population strongly relying on ecosystems for food, feed, fiber, and other services; therefore, the lost vegetation must be replaced by interventions that boost tree cover in the farming systems. Doing so will create a carbon-rich landscape that promotes the resilience of the community and thus underlines the importance of agroforestry for The Gambia.

# **VISION AND MISSION OF THE STRATEGY**



# CHAPTER TWO

## VISION AND MISSION OF THE STRATEGY

### 2.1 Vision

Agroforestry becomes a mainstream intervention to achieve increased productivity, climate-resilient, and socially inclusive landscapes in the context of sustainable development.

### 2.2 Mission

To create an enabling environment for promoting the adoption of agroforestry in The Gambia through policy mainstreaming and coordination, institutionalization, knowledge creation and management, strengthening of markets and incentives systems, and embedding inclusive governance that is representative of the needs and interests of all.

### 2.3 Overall goal

The goal of this strategy is to present strategic guidance to promote agroforestry interventions as a pathway to address land degradation, food insecurity, and vulnerability of the agricultural systems to climate change effects in The Gambia.

### 2.4 Specific objectives

The specific objectives are to:

1. Establish a policy and institutional basis for the wider promotion and adoption of agroforestry in The Gambia.
2. Enhance coordination in agroforestry programmatic designs and implementation to promote institutional collaboration.
3. Promote agroforestry knowledge generation, dissemination, monitoring and backstopping for effective adoption of context-appropriate agroforestry practices at scale.
4. Devise incentive and investment mechanisms for agroforestry through enhanced value chains promotion.
5. Create an enabling environment for inclusive participation of all stakeholders in agroforestry promotion and adoption, and the development of associated value chains.

### 2.5 Key Principles guiding the strategy

- a. **The multi-institutional nature of agroforestry should be appreciated:** Agroforestry practices touch on diverse institutions that could play a critical role in its promotion. It transcends institutional boundaries and mandates.

- b. The multisectoral nature of agroforestry should be considered in every agroforestry promotion:** Agroforestry is relevant for agriculture, forestry, biodiversity, energy, climate change, food and nutrition, job creation, and numerous others.
- c. Agroforestry promotion should be context-specific:** There is no single agroforestry intervention that fits into all socio-ecological contexts. Designs of interventions should consider the prevailing context.
- d. Agroforestry, depending on the designs, could be a complex practice.** It could embed different life forms e.g., trees, livestock, annual crops which could be part of a single intervention.
- e. Agroforestry designs should consider inclusive and participatory approaches to address the needs of stakeholders.**
- f. Partnerships and collaborations play a fundamental role in promoting agroforestry.** It is difficult for a single institution or sector to fully accomplish the adoption and promotion of agroforestry.
- g. The design and promotion of agroforestry should align with national priorities, commitments, local and gender needs.**
- h. Research and Development.** Agroforestry is an evolving concept and practice globally hence the need for continuous research and development on its suitability in different contexts.

# **CURRENT STATE OF POLICIES**



# CHAPTER THREE

## CURRENT STATE OF POLICIES, STRATEGIES, PRACTICES AND POTENTIAL MARKETS FOR AGROFORESTRY PRODUCTS

### 3.0 Overview

The 1997 Constitution of The Republic of The Gambia, Chapter XV Section 192(3h) states that “An Act of the National Assembly shall make provision for the functions, powers, and duties of local government authority including provision for the preservation of the environment”. Additionally, Chapter XX Section 215(4d-e) stated that the state shall pursue a policy of protecting the environment of the nation for posterity, and cooperation with other nations and bodies to protect the global environment. As part of national duties, every citizen shall “protect and conserve the environment of The Gambia” (Chapter XX, Section 220 (1j)).

### 3.1 A look at agroforestry practices in the Gambia

The baseline report by Duguma et al. (2020) suggested that there is a form of knowledge and practice on agroforestry though most of them are not deliberate. About two-thirds of the households interviewed in CRR, LRR and URR regions have integrated trees in their farmlands, with the EbA project deliberately mobilizing more farmers to either adopt or scale up agroforestry in their farmlands. Based on the stakeholders’ feedback from the consultation reports, there are several perceived benefits of agroforestry as summarized in the table below.

**Table 1:** Benefits of agroforestry in The Gambia

<b>Economic</b>	<b>Environmental</b>	<b>Social</b>
Improve economic resilience through diversified farming products	Maintains and improves soil productivity through nutrient recycling and soil protection	Improvement in rural living standards through balanced nutrition
Reduction in energy costs due to enhanced production of fuel wood	Disaster risk reduction and improvement of microclimate, such as lowering of soil surface temperature and reduction of evaporation of soil moisture through a combination of mulching and shading	Improve household food security through food diversification
Creation of new markets and improved value chains	Improved land use management	Guarantees land security and minimizes boundary conflicts

Creates rural employment opportunity for farmers	Greater and sustained biodiversity	Promote gender equality through empowerment of women
Provides source of fodder for livestock	Climate change mitigation through increased carbon sequestration	Flexibility of the farming enterprise

In addition, the stakeholders noted available of the arable lands, diversification of the land use, availability of manure to improve soils fertility and availability of labour as some of the key opportunities that can be explored in scaling agroforestry. However, challenges such as bushfires, droughts and insufficient supply of water, termite invasion, inadequate access of seedlings and farm inputs, and free roaming animals were cited which needs to be addressed for agroforestry systems to be successful in The Gambia. Building capacity of the farmers to adopt and scale up agroforestry also remains a major opportunity for investment. Some of the areas of priority includes tree seeds propagation, seeds selection, evergreening and conservation agriculture practices, zai pit techniques, farmer managed natural regeneration, and agroforestry products value addition and marketing.

In terms of preferred agroforestry practices, there are several factors that influence the choice of the preferred system and tree species, depending on the household's needs, farmland context and accessibility of the right seedlings and farm inputs. A mixture of both indigenous tree species that are more tolerant to The Gambian climatic conditions and exotic species that have additional benefits such as fast maturity was recommended to ensure a more sustainable agroforestry regime in the country. Some of the cited systems and species are summarized in the table below

**Table 2:** Preferred agroforestry practices and species

Preferred agroforestry practice	Preferred species
Multipurpose woodlots	Timber trees including mahogany, gmelina, rose wood, bombax, etc
Boundary planting	Species such as cashew and gmelina
Alley cropping/wind breaking species / fire breaks	Including cashew, gmelina
Fodder / nitrogen fixing species	These includes acacia, leucaena, etc
Fruit orchards	Fruit trees such as cashew, mango, orange, lime, etc
Wild edible species	These includes ziziphus, cordyla, baobab, parkia, tamarind, saba, etc
Medicinal tree species	Including moringa

## 3.2 Existing complementary mechanisms for promoting agroforestry in The Gambia

### a) Multilateral environmental agreements and treaties

The Gambia is a signatory to several regional and international agreements that target sustainable protection and sustainable use of natural resources. These include the Convention on Biological Diversity (CBD) which focuses on sustainable use of biological diversity and fair sharing of benefits resulting from the use of associated genetic resources. Being a signatory to this Convention has guided the development of the National Biodiversity Strategic and Action Plan (NBSAP), 1999, which aims at increasing protected area coverage from 6% to 10% (NEA, 2010).

Other agreements of importance that the country has signed include the Convention on International Trade of Endangered Species of Wild Flora and Fauna (CITES), Convention on Wetlands of International Importance (The Ramsar Convention), Convention on Migratory Species (CMS), United Nations Convention to Combat Desertification (UNCCD), United Nations Framework Convention on Climate Change (UNFCCC) and the Africa Eurasian Waterfowl Agreement (AEWA). Additionally, the country is a signatory to regional agreements and treaties. Being a signatory to these global agreements implies The Gambia is working towards global efforts to conserve and sustainably use biodiversity. It is however not the objective of this report to determine whether the country has followed the ratified obligations to the letter. Some progress can however be mentioned; the country has well designed policy documents and strategic plans to inform the use of various ecological assets related to parks and community conservation areas. An example is The Gambia Environmental Act and Action Plan (GEAP), the National Climate Change Adaptation Plan of Action (NAPA 2007) and the wildlife policy (2003) (UNEP, 2015 and NEA, 2018). The GEAP is meant to serve as the national umbrella environmental framework while the NAPA recognizes the need to preserve coastal and terrestrial biodiversity.

The Gambia has completed implementation of its third forest policy circle and has recently developed a new forest policy for the period 2021 – 2030. The goal of the new forestry policy is *'to conserve and sustainably manage and develop at least 30% forest cover in the country that can contribute to national socio-economic and environmental development and protection and to meeting The Gambia's commitments under relevant international and regional conventions and agreements.*

### b) Participatory Forest management

In the 1990s, in a bid to stop ongoing deforestation and forest degradation, the Department of Forestry piloted the conceptualization of decentralizing the management of the forest resources so that local communities would have a clear mandate and ownership in the resources located in their traditional lands. The decentralization of forest resource management was critical to engaging the local communities who were previously engaged in clearing forests and converting forest lands to other economic uses (Camara and Dampha 2007). This measure was critical to abate the impacts of bush fires, clearing forests for agriculture, and expansion of *Gmelina arborea* plantations.

The initial process of decentralization began with the development of the concept of participatory forest management for The Gambia with Community Forestry (CF) at its core. Forest Act (1998) defines CFs as “forests designated as such in accordance with section 68 and which are owned and managed by the designated communities for the purpose of timber, firewood and nonwood forest produce production, forest grazing, protection, and conservation.”

### c) Protected areas

In The Gambia, the protected areas are integrated and include principal habitats such as mangroves, forests, tidal zones, gallery forests, and savannah woodlands. Consequently, the wildlife policy aims at increasing the proportion of protected areas to 10% of national land territory since biodiversity resources in these entities contribute significantly to the living standards of The Gambians. The range of international, regional, and national instruments has triggered action aimed at the creation of protected areas.

In The Gambia, 22 protected areas<sup>1</sup> including national parks, reserves, and community protected areas (CPAs) or community conservation areas exist (UNDP and GoTG 2012). These are located in various regions and are created to protect unusual species and ecosystems of national priority. Two of the parks and one reserve, in the wetland ecosystem, are Ramsar sites implying they are of global importance as pertains to the in-situ conservation of wetlands. Six protected areas are recognized as important bird nesting grounds.

## 3.3 Value chains that illustrate the attractiveness of the agroforestry development

### 3.3.1 Sustainable forest products enterprises

**Timber:** An assessment by UNDP & GoTG (2012) in 2007 revealed that about 42 sawmills were operating in the country. In the past, trees were felled with an axe or pit saw and made into the timber with a pit saw. More recently, the felling of trees and processing into timber is with the aid of chain saw and machines. By 2005, two mobile sawmills had been introduced in the country and operated in community and state forests in the CRR and the URR. In 2005, about 16 interest groups (IGs) with 107 members who had used the Market Analysis and Development approach (Thoma and Camara 2005) were attracted by the log/timber enterprises. Five of these enterprises calculated the profitability of processing tree trunks into high quality timber and found that profits could increase four to tenfold if they used a mobile sawmill compared to hand felling. If the enterprise were to bear the daily costs of operating the machine, maintenance costs, and the operators’ salary, it still would make profits. Profits were further increased if the members were sufficiently trained in sawmill operations to avoid miller fees (Thoma and Camara 2005).

Estimates of the total timber production capacity in the country were not available. Available data estimating production and sales of some selected timber enterprises from three regions that were introduced to the Market Analysis and Development (MA&D) approach revealed they could produce 225m<sup>3</sup> of timber in 2005. This was expected to generate a total net profit of GMD 833,973. The net profits accounted for about 73% of the total income of the enterprises suggesting a very profitable business. It is worth noting that the rental cost of the Lucas mill is

<sup>1</sup> In this section of the report the term Protected Areas implies either of the entities i.e., parks and or CPAs

not factored in the analysis below because the Lucas mill was offered free of charge. Factoring in the rental cost will reduce the net profit margin. Development of sustainable timber-based agroforestry systems such as woodlots has the potential to meet the commercial timber needs without causing an environmental destruction.

**Fuelwood:** Over 80% of the energy used in The Gambia comes from wood related biomass. From the latest Gambia Bureau of Statistics (GBOS, 2012) figures, charcoal usage in The Gambia stands at 35.1% and 1% in urban and rural areas respectively. Firewood usage figures are equally high at 94.5% and 48.1% in the rural and urban areas respectively. Charcoal is primarily produced in rural areas, especially the Lower River Region (LRR) where even women have begun to cut down trees and engaged in charcoal production due to a lack of alternative income sources. One of the drivers is the high demand in key adjacent urban markets in Soma, the West Coast Region and the Greater Banjul Area. While charcoal production is banned in The Gambia, the fuel source is widely present in open markets. If there are no clear measures taken, there is a strong tendency that the population of the standing trees might shrink quickly due to the harvesting for charcoal making to fulfill the rising urban demand. Such actions jeopardize the whole restoration efforts in the project regions. The booming demand is due to a lack of access to, and high cost of electricity and other alternative technologies of energy generation in rural and urban settlements. Through agroforestry, fuelwood demand can be achieved in the country.

**Rhun palm handicrafts:** Rhun palms (*Borassus aethiopum*) are important in the socio-economic lives of local communities in The Gambia. The tree has many uses - the fruit is edible, as are the tender roots produced by the young plant; fibers can be obtained from the leaves; and the wood, which is reputed to be termite-proof, can be used in construction. The rhun palm is used mainly to provide plants/sticks and leaves as roofing or fencing materials. Normally, a frame is made from Rhun palm splits, and the huge leaves are laid over it to create a waterproof canopy as a thatched roof. Deforestation activities have made it quite difficult to find rhun palm in certain localities in The Gambia. Among the EbA intervention sites, Central River Region (CRR) North, particularly in the Nianijas and Saloums, the growth of rhun palm appears to be very favorable. The farmlands in some of these communities are inundated with rhun palm seedlings which are usually cleared by farmers to enhance animal traction during crop production. The multi-purpose centers in all EbA intervention areas were not engaged in rhun palm handicraft. The Rhun palm, once among the most dominant species of The Gambian forests, is used for various purposes. It is extremely durable, and the termite-resistant stem is cut into splits and used for roofing, fencing, and other construction purposes (Thoma and Camara, 2005). The dry leaves are used for thatching, fencing, and wickerwork, and nuts and palm hearts are a welcomed diet for rural families. However, the palm tree has been overexploited in the past years because of its valuable trunk with the result that only a few remnants of the formerly dense palm forests are left. Although mature trees have widely disappeared, rhun palm regeneration is still abundant in many parts of the country providing a continuous supply of leaves. The leaf fronds and stems are sold locally at generally low prices for household construction purposes. The market opportunity in the sale of handicraft works from locally manufactured rhun palm products from fronds and stems is generally low. The communities need more skill training to process these raw materials into value-added

products. The MPCs should set up a handicraft enterprise effectively using the skills learned to produce a large quantity of handicrafts that can be sold at local markets, eco-tourism lodges in the provinces as well as to hotels in the coastal tourist areas.

### 3.4 Relevance of Policies and Legal Frameworks to Agroforestry Promotion in The Gambia

**The Gambia Agriculture and Natural Resource (ANR) Policy (2017 – 2026)<sup>2</sup>:** The Policy is guided by the attainment of the overarching objective of poverty reduction and enhancement of food, income, and nutrition securities through the optimal utilization of the resources of the sector consistent with safeguarding the integrity of the environment. To achieve this target objective, modernization and increase in productivity and value addition through substantial capital expenditure in the horticulture, crops, livestock and forestry subsectors are needed. One of the key strategies to spur and sustain the potential growth momentum of the Agriculture and Natural Resource sector is to optimize the use of land and other resources through the promotion and adoption of appropriate agroforestry systems and enrichment planting of the existing forest reserves. Furthermore, the transformation of crops and tree products into higher value market products is equally essential in the promotion of agroforestry.

**National Climate Change Policy of The Gambia:** By 2025 the National Climate Change Policy aims to mainstream climate change into the national planning, budgeting, decision-making, and programme implementation, through effective institutional mechanisms, coordinated financial resources, and enhanced human resources capacity. The policy is designed around four strategic focal areas, key among is the “Climate resilient food systems and landscapes”. This strategic focal area highlights sectors that are both of critical importance for the economy, environment, as well as for the livelihoods of its people, including those of the poorest and most vulnerable sectors of the population. The strategic adaptation and mitigation priorities in this strategic focal area include broadening and deepening carbon sinks through tree planting, participatory sustainable forest management, agroforestry, organic farming, and soil and water conservation measures. Strategic priorities for the agricultural sector include improving soil fertility, soil conservation, and water management through farmer education, investments in low-input structures, agroforestry initiatives, and incentives to national grower associations and community producer associations.

**National Forestry Strategy (2019 – 2028):** Forestry sector priorities highlight strategies to implement ecosystem-based adaptation (EbA) approaches within a well-managed afforestation and reforestation programme. In the new National Forestry Strategy, the Department of Forestry (DoF) shall develop management systems that will favor forest and land restoration processes, preferably to plant indigenous species that enhance the productivity and resilience of the forest. The strategy will encourage and promote the practice and culture of agroforestry by planting a wide range of useful trees on farmlands and in rural landscapes. Many of these trees are multipurpose, providing a range of benefits. Among these will be soil nutrient enrichment plants for land regeneration, fodder trees that improve smallholder livestock production; soil health and food security; medicinal trees for pest and disease control; fruit trees for food and nutrition security; timber and fuelwood trees for shelter and energy. One of the key strategic

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<sup>2</sup> Draft ANR Policy

directions of the National Forestry Strategy is the integration of technologies and systems into agroforestry practices. Recommended agroforestry practices would include windbreaks, alley cropping, tree/pasture systems, live fences, riparian forest buffers, tree/specialty crop systems, forest/specialty crop systems (forest farming), and wildlife habitat, and fuelwood plantations. The Strategy entails providing and offering options in agroforestry systems, and advice to improve the social, economic, and environmental aspects of agroforestry development and conservation. The need to provide technical support to promote technology transfer, catalyze change and build effective and sustainable local capacity for sustainable agroforestry management is fundamental.

**Gambia National Adaptation Programme of Action (NAPA) on Climate Change:** The National Adaptation Programme of Actions (NAPA) on Climate Change seeks to address urgent and significant climate threats through actions that deliver immediate adaptation benefits and contribute to building local and national adaptive capacities of communities. Agroforestry and agricultural market reforms *inter alia* are perceived as catalysts for optimal forest resource utilization. NAPA places a strong emphasis on afforestation and sustainable management of forest resources. Integrated land and water management should be accorded high priority. Intensive feed gardens (IFG) and intensification of agroforestry practices will require complementary measures to reduce vulnerability to climate change. Expansion and intensification of agroforestry and re-forestation activities will entail widely adopted agroforestry and reforestation systems in 162 villages in the country.

**Second Generation National Agricultural Investment Plan-Food and Nutrition Security (GNAIP II-FNS) (2019-2026):** The Second Generation National Agricultural Investment Plan-Food and Nutrition Security (GNAIP II-FNS) constitutes the main investment framework for agricultural development in The Gambia in the medium term (2019-2026). GNAIP II was formulated through a participatory process of stakeholders from the public and private sectors, including farmer organizations. The Plan “aims to increase food and nutrition security at household level including vulnerable households through increased ANR productivity based on sustainable use and management of natural resources in support of national goals of poverty reduction and improved livelihood”. GNAIP II is hinged on four strategic axes: improving production and productivity of agro-forestry-pastoral and fisheries sectors; structuring of the value chains of the products; strengthening the resilience of vulnerable populations; and governance. One of the key strategic goals of the plan is ecosystem resilience and the contribution of biodiversity to carbon stocks enhanced through conservation and restoration of degraded ecosystems. Also stated is the need to promote incentives for the local communities through woodlots and traditional agroforestry mitigation activities and programmes.

**Nationally Appropriate Mitigation of Action (NAMA):** The Gambia’s NAMA identified eight priority mitigation projects and two mitigation/adaptation projects. The process of developing the NAMA was very inclusive and commitment from relevant stakeholders was secured. One of the mitigation actions included the restoration of degraded grazing lands through the multiplication and popularization of forage seed planting of multiple-purpose plants.

**Strategic Programme for Climate Resilience (SPCR):** The Strategic Programme for Climate Resilience (SPCR, 2017) builds on an implementation plan of the long-term vision to achieve

a climate-resilient development trajectory. It defines five key climate resilience priorities, of which Pillar 4 of the SPCR is anchored on “Developing integrated approaches to build rural climate resilience in The Gambia”. Component 2 of this pillar indicates the “Sahelization” of ecosystems in The Gambia to support the resilience of small-scale farming, livestock, and wildlife sub-sectors.

**Second Nationally Determined Contribution (NDC) of The Gambia:** The Gambia’s NDC recognizes land use, land-use change, and forestry (LULUCF) as important factors to be considered in the country’s mitigation efforts. Among them is the multistrata agroforestry initiative aimed at combining agricultural and forestry activities to improve food security. This circular mitigation strategy aims to strengthen these initiatives to increase tree cover in The Gambia, both in urban and rural areas. Trees help retain water and improve drought resilience, provide food to the rural population in case of shortages, and provide shade in cities. The Mitigation and Adaptation Technology Action Plan of The Gambia recognizes conservation agriculture as a priority area.

**National Biodiversity Strategy and Action Plan (NBSAP) (2015 – 2020):** The National Biodiversity Strategy and Action Plan’s overall vision 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. The strategy, in partnership with the Department of Forestry, is to promote the establishment of forest plantations and appropriate agroforestry practices. Furthermore, it is to devise and implement participatory forest management approaches, for both indigenous forest and forest plantations/ agroforestry, involving local communities and other stakeholders.

**National Forestry Policy:** The National Forestry Policy seeks to achieve the sustainable management of sufficient forest cover that could meet the social, economic, environmental, and livelihood needs of the current and future generations. The goal of this policy is to conserve and sustainably manage and develop at least 75% of the total land area of 30% of the forest cover in the country that can contribute to national socio-economic and environmental development and protection. The seventh Policy Statement seeks to promote agroforestry and on-farm forestry to enhance tree cover in the country while contributing to increased income for farmers. Strategically, it promotes agroforestry, on-farm fuelwood plantation establishment, and farm boundary planting, creates awareness on the benefits of agroforestry, and strengthens capacity development in agroforestry for farmers and other stakeholders.

**ENABLING  
INSTITUTIONAL  
CONTEXT**



# CHAPTER FOUR

## ENABLING INSTITUTIONAL CONTEXT

### 4.1 Institutional Frameworks

Numerous institutional frameworks could provide a solid starting base for promoting agroforestry in The Gambia. Table 1 describes the institutions of high relevance at the national level for promoting agroforestry adoption to solve the environmental challenges the country is facing and capitalize on the opportunities.

*Key strength: There are many institutions and sectors that intervene on agroforestry in its different forms. These existing institutions can boost agroforestry adoption and promotion.*

*Key challenges: The institutions inadequately work together despite operating in similar environments.*

**Table 3:** Ministries that could play a crucial role in promoting agroforestry in various sectors and locations

Name of the institution	Roles	Relevance for Agroforestry strategy and its Promotion
Ministry of Agriculture	The ministry is responsible for the implementation of sustainable agricultural systems in the country while minimizing the environmental impacts of agriculture.	Agroforestry is one of the key paths to diversifying agriculture and reducing the vulnerability of communities to drought and other climate factors. Agroforestry practices that include nitrogen-fixing species such as <i>Faidherbia albida</i> are known to improve soil fertility and agricultural biodiversity.
Ministry of Environment, Climate Change, and Natural Resources	MECCNAR is responsible for overseeing and coordinating the development and implementation of policies and programs relevant to the environment, climate change, and natural resources management.	Agroforestry is one of the strategies that promote land restoration. MECCNAR in partnership with DoA and other environmental stakeholders could provide relevant support in the areas of judicious land use in the context of climate change adaptation.

Ministry of Lands, Regional Government and Religious Affairs	The ministry is responsible for effective land resource management and local governance	Agroforestry is crucial in lands management and restoration, and this ministry can play a role in enhancing effective land management in different regions and inclusivity of different religions
Ministry of Gender, Children and Social Welfare	The ministry aims to create a harmonious and inclusive society	The ministry is critical in promoting inclusivity of all stakeholders including children and special interest groups
Ministry of Fisheries and Water Resources	The ministry aims to promote sustainable development of fisheries, climate and water sectors	The ministry can promote aquaforestry at household and community level to promote fisheries development
Ministry of Finance and Economic Affairs	The ministry is responsible for financial and economic policies in the Gambia through different departments	The ministry can provide sufficient budgetary allocation to related institutions for agroforestry development and scaling
Ministry of Trade, Employment and Regional Integration	The is mandated to formulate and implement trade, investment and industrial policies that promote investment in the productive sector for increased production and export	The ministry can play a key role in promoting trade and investment in agroforestry related goods and services

At a more practical level, The Gambia has numerous government departments that could play a pivotal role in pushing the implementation of the agroforestry strategy for sustainable landscapes and livelihoods as summarized in the table below.

**Table 4:** State and non-state actors (departments, agencies, CSOs, NGOs) that could play a crucial role in promoting agroforestry in various sectors and locations

Government departments

Name of the institution	Roles	Relevance for Agroforestry strategy and its Promotion
Department of Forestry	DoF is responsible for the community forestry scheme which entails lands assigned for forest management and parts used for farming practices by member communities.	The introduction of agroforestry in the farming systems within the CFs could strongly reduce the exploitation of community forests as it diverts pressure for wood.
Department of Community Development	The Department is mandated to enhance and promote the empowerment of communities in charting their destiny through participatory development processes.	The department has played an active role in the EbA project and will be key in mobilizing communities towards promotion of agroforestry practices
Department of Agriculture	The department is responsible for agricultural activities in the Gambia	The department through its extension officers can play a role in training and supporting farmers in developing and scaling agroforestry practices at the farm level
Department of Livestock Services (DLS)	DLS is responsible for the management of the livestock sub-sector.	Livestock management is mainly extensive/free-range pasture-based form of rearing. DLS is to ensure new strategies are developed to manage livestock in such a way that damage to agroforestry crop areas is protected from animals.
Department of Parks and Wildlife Management	DPWM is responsible for the community-protected areas or community conservation areas where members of the community undertake some livelihood activities, mostly farming.	Agroforestry practices such as trees on farms and woodlots could be useful means of reducing wood extraction for charcoal from the parks and other illegal wood collections.
Department of Water Resources	The DWR is mandated to regulate and manage the sustainable utilization of water resources.	Water supply is essential in successful Agroforestry implementation. The DWR will play technical support for the design, construction, and maintenance of water supply facilities in the planted areas.

## National agencies and institutions

There are several national agencies drawn from the public, private and community sectors that can play a crucial role in the agroforestry strategy implementation in the Gambia. Some of them are summarized below.

Table 5 Different agencies that can play supportive roles in agroforestry development in the Gambia

Name of the institution	Roles	Relevance for Agroforestry strategy and its Promotion
National Environment Agency	NEA is the main technical body responsible for ensuring that the environmental resources are judiciously used sustainably.	The NEA ensures that the introduction of various agroforestry practices will promote environmental stewardship by conducting Environmental Impact Assessment advisory services to communities.
National School of Forestry	Training of students in forestry at certificate and diploma levels.	The National School of Forestry is to ensure students are trained in agroforestry to subsequently provide technical support to communities venturing into agroforestry.
National Coordinating Organization of Farmer Associations Gambia (NACOFAG)	NACOFAG is the farmer umbrella group in The Gambia. One of its main thematic focuses is the promotion of agroecology and agro-forestry development targeting climate resilience and indigenous knowledge.	NACOFAG can organize farmers into cooperatives to better improve their agroforestry practices.
Soil and Water Management Services (SWMS)	The SWMS oversees developing policies on soil and water management, and land capability zoning.	SWMS is to ensure soil analysis and conservation to promote sustainable agroforestry.
National Agricultural Research Institute (NARI)	NARI is the main national body undertaking research for sustainably improving the agricultural sector.	Agroforestry is among the agricultural technologies that need to be widely tested and customized for The Gambian context. NARI in partnership with national and international research institutions could play a pivotal role.
National Disaster Management Agency (NDMA)	The NDMA has the authority to engage in planning, coordination, and implementation activities related to disaster risk reduction at both the national and local levels.	The introduction of indigenous tree species within farmland and forest ecosystems could potentially reduce the impacts of flood and erosion.

Renewable Energy Association of The Gambia (REAGAM)	REAGAM is active in the promotion of the renewable energy sector in The Gambia.	Agroforestry can offer numerous ecosystem goods for communities. REAGAM can develop low-cost renewable energy technologies from agroforestry-based resources.
University of The Gambia	The UTG through the School of Agriculture and Environmental Sciences is mandated to provide the human resource base required to sustainably manage and develop the country's agriculture and natural resources (e.g., land, marine, and aquatic).	The UTG is to develop degree programmes to produce graduates who are academically skilled, professionally competent, and innovative in agroforestry.
The Gambia National Youth Council (NYC) is the parent body of all youth organisations in the Gambia.	mobilization and coordination of youth in agroforestry participation.	NYC is the parent body of all youth organisations in the Gambia and can play a critical role in mobilizing and coordinating youth towards increased participation in agroforestry practices
The Gambia Federation of the Disabled (GFD)	Inclusive participation in agroforestry activities.	As an umbrella organisation that represents the disability sector and brings together all disabled Peoples Organisations (DPOs) and People with Disabilities (PWDs) in The Gambia, the group is important in enhancing inclusivity in agroforestry practices
Gambian women bureau	Promotion of women participation and empowerment in agroforestry activities.	The bureau is critical in promoting and supporting women in agroforestry

Regional bodies such as ECOWAS (Economic Community of West African States) via its subsidiary organ; the Permanent Inter-State Committee on Drought in the Sahel (CILSS) could play a crucial role in promoting sustainable agricultural practices that embed agroforestry as the main diversification pathway. ECOWAS in particular played key roles in the agriculture and food self-sufficiency of the region.

## 4.2 The Need for Institutional Identity for Agroforestry

Despite many institutions in the country talking about and mentioning agroforestry in its various forms, there is no single institution that is mandated as a responsible agency for the wider adoption and promotion of the practice. The Department of Agriculture seems to have been given some mandate; however, the mandate is limited relative to the potential of the practice to contribute to wider livelihood, economic, and biodiversity benefits in the country.

Noting the potential, the Government of The Gambia should consider designating an institution that is fully responsible for the coordination and promotion of agroforestry programmes in the country.

## 4.3 Capacity Building

### 4.3.1. Training

As The Gambia is yet to have a dedicated programme in any institution for training on agroforestry, it is crucial to fill the gap through international or regional collaboration with organizations or educational institutions undertaking such trainings to support the wider promotion and adoption of agroforestry. Such short-term training could focus on training of trainers that could scale up the training to the wider community level support providers through the extension systems. It is important that training focuses on the immediate needs and delivers skills relevant to agroforestry practices that are to be promoted in the immediate future.

### 4.3.2. Formal and informal education

The Gambia currently does not have a formalized programme on agroforestry. As a result, most of the technical staff who work with the communities do not have a strong background in agroforestry in general.

A standalone curriculum on agroforestry at the University of The Gambia and the National School of Forestry is needed. The curriculum should be designed in such a way that it equips the young people who go out to support communities or educate the other young people in elementary and high schools. The curriculum could be designed to be delivered at certificate, diploma, or bachelor's degree levels.

### 4.3.3. Research capacity

Research and innovation in agroforestry are very critical to implementing appropriate agroforestry practices that match local contexts. The process of selecting the right species for the right place and purpose needs to be evidence-based and proven through rigorous scientific procedures that can ascertain success rates. Besides, The Gambia could also benefit from technologies in nearby countries through technology transfer techniques. During the process of technology transfer, it is important to research the suitability of the technologies for The Gambian context. Thus, the research and innovation capacity around agroforestry should be strongly built. Institutions such as NARI and The University of The Gambia could be empowered to build such research capacity to help in the adoption and promotion of appropriate agroforestry

practices. Such capacities could be built in partnership with international agencies such as the World Agroforestry (ICRAF), Center for International Forestry Research (CIFOR), among others.

#### 4.3.4. Farmer to farmer knowledge dissemination

One of the key pathways for knowledge dissemination is to identify the right sources of skills and experiences and promote horizontal knowledge exchange among the actors. In many countries, the farmer-to-farmer exchange has proven to be a highly effective way of disseminating technologies. Agropastoral communities in The Gambia could be put on knowledge exchange missions to other neighboring countries in the region such as Niger, Mali, and Burkina Faso for farmer-to-farmer knowledge exchange. The exchange programmes could also go to other regions with similar agroecological contexts. Once such cross-regional exchanges are done, farmers could also do knowledge exchange visits within the country to learn from each other. There is a need for a deliberate investment to support such exchange programmes for farmers.

### 4.4 Business Support Schemes

Communities in The Gambia have adopted selected agroforestry practices that are directly connected to business. For example, cashew agroforestry, on-farm trees (e.g., *Cordia Africana* (wulakono dutto), and tree nursery enterprises are among the few. However, communities are undertaking such practices based on the generic skills they have acquired from their parents.

Enriching the current skill sets is very crucial, especially considering the need for the wider adoption of agroforestry. To be successful, there is a need for:

- a. A business advisory service to local communities with a tailored skill set and resources for agroforestry-based value chains. Locally available extension systems do not have any support that is specific to agroforestry beyond how to plant seedlings.
- b. As with any investment, communities should have access to credit schemes that are needed to start agroforestry-based value chains such as cashew, fruit trees, etc. Local communities often do not have the funds to establish the farms from the onset.
- c. With climate change becoming a major factor affecting production, it is important to cushion communities against the effects of climate change. One potential mechanism to popularize crop insurance schemes.

### 4.5 Agroforestry Partnerships development

The Gambian Constitution strongly emphasizes the need for collaboration and partnerships to manage and conserve the environment. Article 215 (4)e states “*The state shall pursue a policy of cooperation with other nations and bodies to protect the global environment*”. Hence the country’s ambition is even bigger than the national scale interventions needed to protect its ecosystems.

The Gambian ecosystem, due to weak law enforcement, has been subjected to significant degradation especially the agricultural landscapes and the forests. The main pressures emanate from the increasing need for food, feed, and wood for construction and energy. Agroforestry,

if properly designed and implemented, could provide a lasting solution to the food, feed, nutrition and wood-related pressures impacting the wider ecosystems. There is thus a strong need for investments in promoting deliberate collaboration and cooperation among those entities actively involved in agroforestry-related activities. There is a need for a clear partnership framework that helps to monitor progress and accountability among the key actors:

- a. Local community groups (e.g., community forests, community protected area groups, Multipurpose centers, etc.)
- b. Local authorities responsible for natural resources management (e.g., governors, district and village heads, National women councilors, youth council, Gambia Federation of Disabled, among others).
- c. Technical departments (Forestry, Agriculture, Parks and Wildlife, Community Development and related ones)
- d. Ministries (Environment, Agriculture, etc.)
- e. Research and academia (e.g., University of The Gambia, National School of Forestry, NARI, Rural Development Institute, etc.)
- f. Regional bodies (e.g., CILSS, ECOWAS, Africa Union, World Agroforestry, etc.)
- g. International partners (Food and Agriculture Organization, etc)

#### **4.6 Gender and Social Inclusion Aspects of Agroforestry**

It is important to recognize that agroforestry interventions are undertaken by both genders. In fact, in some practices such as homesteads and other agroforestry interventions that are undertaken close to residential areas, women play the major role with men mostly moving with livestock during transhumance. Hence, all intervention designs and implementation modalities should include the voices, preferences, and capacities of women in society. There is also a need to emphasize social equity and fairness in the promotion and adoption of agroforestry.

Below are some unresolved inclusivity issues that need to be properly addressed.

- Inadequate access to financial means and opportunities (including inclusive finance) for women, youth and special interest groups such as children, elderly and people with disabilities.
- Inadequate inclusion of women, youth, and vulnerable groups in agroforestry knowledge and support services.
- Unequal access to land and tree tenure (ownership, access, and user rights).
- Inadequate and unbalanced access to agroforestry-based value chain development and market structures.

# **STRATEGY IMPLEMENTATION**

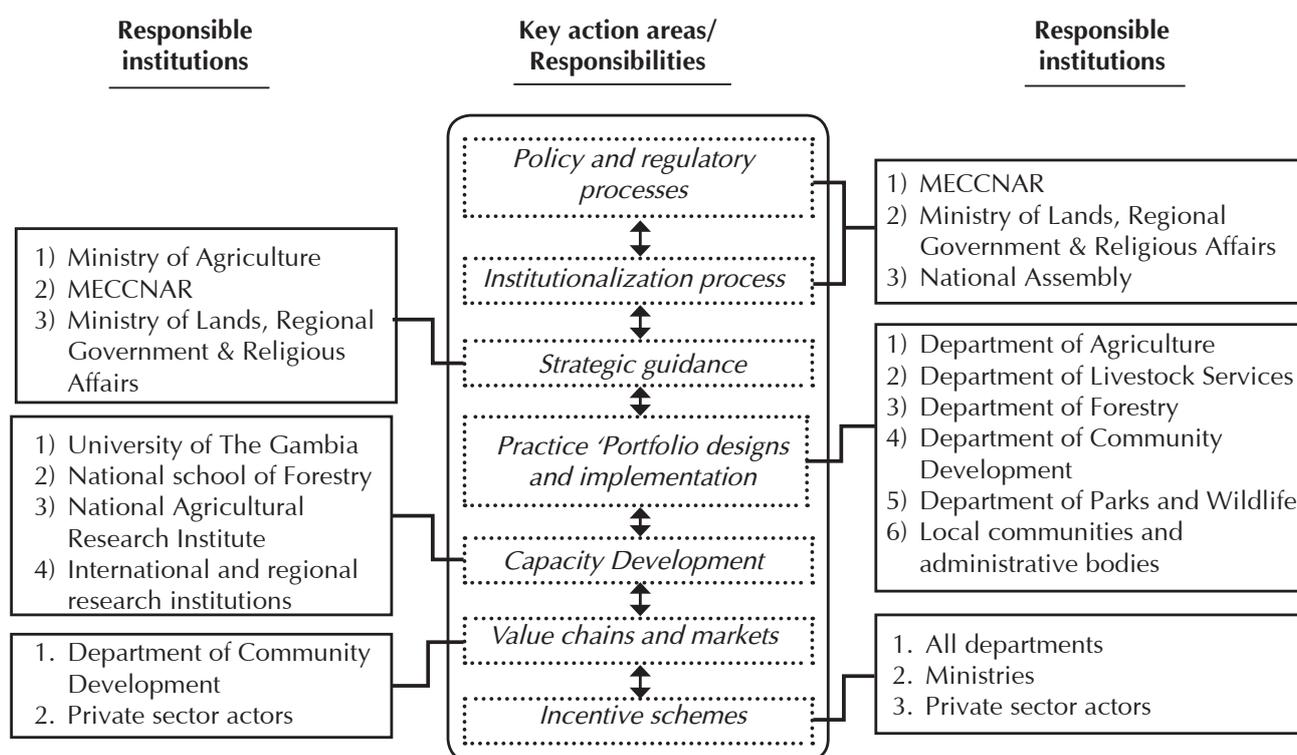


# CHAPTER FIVE

## STRATEGY IMPLEMENTATION

### 5.1 Proposed Implementation Framework

The complexity of agroforestry systems warrants the need for a multisectoral approach that brings together all stakeholders. Successful implementation of this agroforestry strategy requires close collaboration and synergy among different ministerial, departmental, and agencies actors within the agriculture and forestry sectors. The government will be tasked to form an interagency and inter-departmental taskforce involving diverse agroforestry interests, whose mandate will be to coordinate the execution of the strategy as well as the development of relevant policies and action plans. Figure 1 below proposes potential multisectoral engagement pathways and responsibilities for promoting agroforestry. The proposed pathways appreciate the unique and interconnected roles played by different actors (such as the government, research institutions, lawmakers, private sector, and academia) in promoting agroforestry practices as well as their key roles and responsibilities.



**Figure 1:** Proposed agroforestry implementation and promotion scheme with tailored institutional responsibilities. MECCNAR - Ministry of Environment, Climate Change, and Natural Resources.

### 5.2 Mainstreaming Agroforestry into national and international targets and commitments

There are several areas identified for agroforestry mainstreaming for enhanced adoption. Mainstreaming agroforestry with international, national, and regional policies and strategies. Several policies, acts, and laws relating to agroforestry in The Gambia are already established,

however, successful execution of the strategy needs clear harmonization and coordination of agroforestry practices within these frameworks. Establishing an agroforestry taskforce will play a crucial role in establishing the gaps and opportunities for mainstreaming and coordination of strategy implementation taking care of the diverse policy and practice needs across forestry and agricultural sectors. Some of the critical steps in mainstreaming agroforestry in the existing policy framework include constituting a taskforce with clear Terms of references, scoping the policy and capacity gaps and opportunities, public consultation and sensitization, policy mainstreaming and integration report, and final dissemination to the public.

Mainstreaming agroforestry along with gender and sociocultural issues to enhance increased participation by women, youth, and special interest groups (including persons with disabilities and elderly in the society). This will be achieved through conducting national needs assessments and consultations with interest groups to understand the existing gaps and opportunities, and to create a conducive environment for agroforestry adoption. This will also lead to the development of a national agroforestry framework and plan of action for participation.

Mainstreaming agroforestry with the existing and new value chains and markets. In so doing, agroforestry systems will be profitable and sustainable enhancing participation across the country. Some of the identified value chains include rhun palm (*Borassus aethiopum*) handicrafts, firewood, timber and wood, fodder and feeds, and fruits.

The Gambia has also taken commendable steps in mainstreaming agroforestry at international scales. The Second Nationally Determined Contributions (NDC) for the Gambia already identifies as a pathway to meet their conditional and unconditional commitments to greenhouse gas emissions reduction as a pathway to meet their conditional and unconditional commitments to greenhouse gas emissions reduction. This can be achieved through increased carbon sequestration potential, avoided deforestation, and avoided degradation using agroforestry practices. Agroforestry practices also aligns with sustainable development goals (SDGs), with strong impact potential associated with SDG 1 (towards poverty reduction), SDG 2 (alleviating hunger), SDG 15 (life on land) and SDG 13 (climate action). Agroforestry is also covered extensively in the agriculture sections of the Gambia National Adaptation Programme of Action (NAPA) on climate change. The declaration of 2021-2030 as the UN decade of ecosystem restoration provides a great platform going forward for the Gambia to protect and rejuvenate degraded ecosystems, more so the agroecosystems that have continuously faced excessive degradation to meet global food security.

# **MONITORING, EVALUATION, AND REPORTING**



# CHAPTER SIX

## MONITORING, EVALUATION, AND REPORTING

This section describes the role and importance of a monitoring system for agroforestry development in The Gambia.

### 6.1 Monitoring, Evaluation and Reporting Requirements

A monitoring and reporting system for agroforestry development in The Gambia directly supports the on-the-ground and policy elements discussed elsewhere in this report. The system should deliver results based on two fundamental reporting requirements:

- Ability to report on agroforestry processes including change in tree cover, species enrichment, survival rate, community benefits, etc. This information is required for reporting to donors, partners and other stakeholders, as well as for informing agroforestry managers on status and trends. Reporting requirements are captured within a system of key performance indicators (KPIs). Examples of KPIs can be found in Duguma et al. (2020).
- Ability to inform agroforestry managers on how to adjust agroforestry development based on timely capture of problems and successes in agroforestry implementation. Data and information from the platform will inform managers on how best to realign deployed resources (human and financial) according to new knowledge of changing needs.

An agroforestry monitoring system for The Gambia should feature a community-driven design that captures biophysical, socio-cultural, and economic status and impacts that are specific to The Gambian context. A comprehensive view of the data and information needed for developing the monitoring and reporting system is presented in Table 1.

**Table 6:** Data and information needed for monitoring agroforestry development in The Gambia (adapted from Gilruth et al 2021).

<b>Who needs monitoring info?</b>	<b>What monitoring information do they need?</b>	<b>Why do they need it?</b>	<b>In what form do they need it?</b>
Village business groups	Gender disaggregated Information on new markets for agroforestry products; nutritional benefits	To increase opportunities for economic development; improve family and community health	Price data, profit margins, etc. packaged within awareness raising campaigns
Community leaders	New agroforestry policy directed toward their location; Information on new markets for EbA products; nutritional benefits	To provide direction to local communities on business and social opportunities	Materials for communicating information to village groups
Agroforestry staff	Data on social and ecosystem trends compared to baseline; cost-benefit of agroforestry options; degree of community uptake	Identify lessons learned; identify new agroforestry opportunities, to support project management daily	Raw data is initially aggregated to information for sharing with national policymakers as well as local village leaders.
National Policymakers	Aggregated data on social and environmental trends compared to baseline	Evolve new agroforestry policies for implementation; gain political support for agroforestry.	Aggregated information products to feed into policy design
Donors/partners	Key performance indicators (KPIs), return on investment, success stories, problems encountered, other impacts	Funding decisions, upscale results to other countries or regions, gain further funding sources, evaluation planning	Project reports
Science community	Geospatial data on ecosystem trends, species biodiversity, economic impacts, the survival rate of enriched forests, and community uptake of agroforestry.	Establish regional trends, improve decision support platforms for integrating ecosystem and social data	Raw and aggregated data; geospatial files

## 6.2 Tools, Methods, and Protocols

System design should reflect the inter-institutional nature of agroforestry development as different institutions will need to provide or extract data and information from the monitoring and reporting system which is housed on an IT platform designed for that purpose. System design should aim at breaking down information and decision-making silos among key institutions, for example in the domains of agriculture and forestry, water resources, trade and industry, and social services. Data sharing is key to the success of the agroforestry monitoring system for The Gambia.

System design should be driven by an approach that captures data at the most disaggregated level which are then aggregated and collated to meet reporting requirements. The bottom-up approach is used in many areas of research and data management. A key reference for the agroforestry monitoring and reporting system is provided by Gilruth et al (2021).

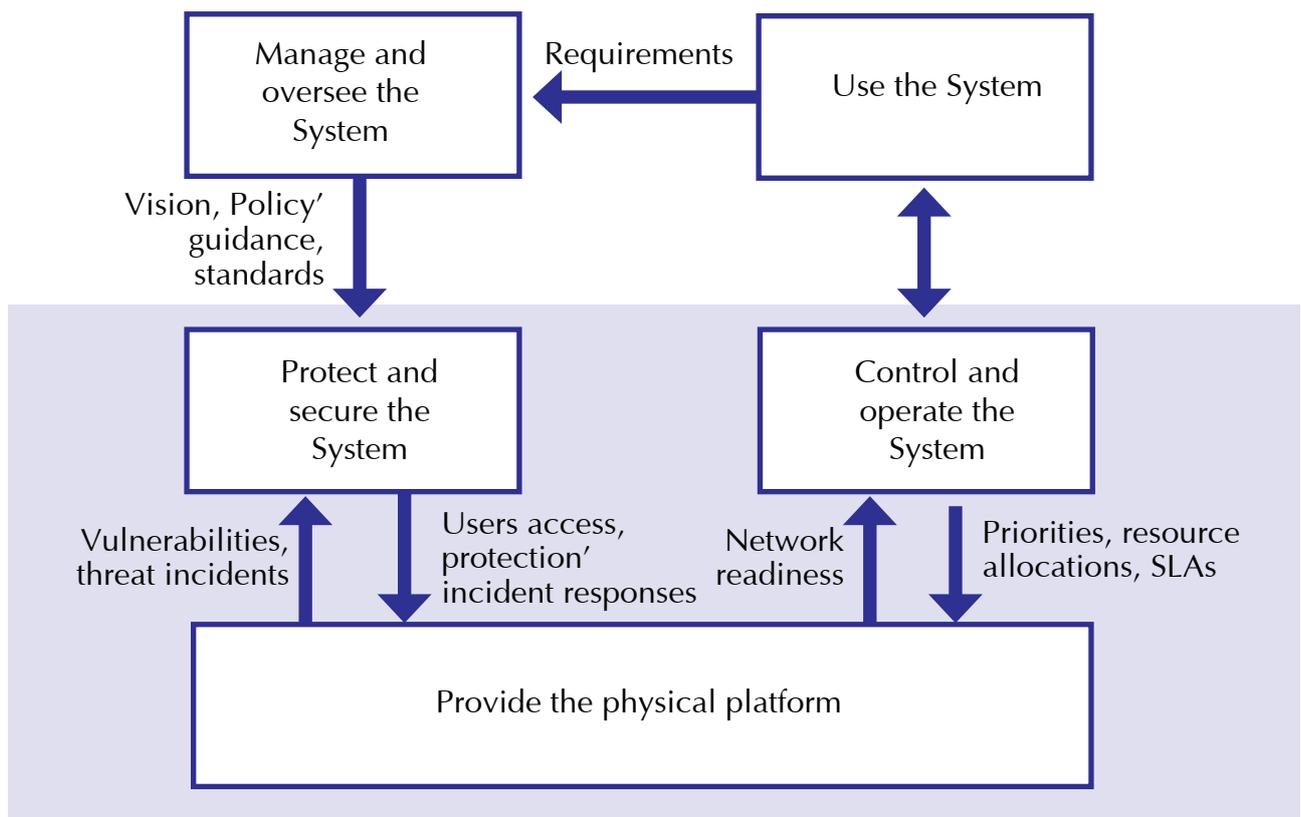
Components of a successful monitoring system should include the following elements:

- Baseline data for the system include base maps with administrative boundaries, census data, agroecological zones, land use maps, water sources and hydrography, meteorological data, etc. These core data are available from the respective Gambian ministries which are mandated for the collection, preservation, and updating of these data.
- Project data are related to those presented in Table 1 above and should be processed in the form of KPIs and geo-referenced to Gambian base maps. Display on maps will facilitate management decision making. The baseline and project data will determine the system architecture, as described for example in Gilruth et al (2021).
- Hardware/software requirements are determined by the quantity and quality of data to be processed within a platform database, as well as the user specifications for reporting periodicity and format. It is recommended that the system take advantage of recent advances in server development and cloud computing to safeguard data holdings.

## 6.3 M&E Framework

The agroforestry monitoring and evaluation (M&E) framework for The Gambia includes key components for its effective functioning to meet management needs. Figure 2 presents the conceptual framework design, “The System”, with its component functions (Gilruth et al, 2021). The System is designed from an organizational perspective to provide a robust architecture for The Gambia’s needs. The Use the System activity enables internal EbA Gambia project users to perform tasks on handling project-related data, information, and projects as well as reporting, while providing the necessary description of requirements to the Manage and Oversee the System activity for completing their tasks. These user requirements govern the System. The resulting data are analysed to help in developing and enforcing policies, guidance, direction, and standards to manage the protection, control, and implementation of the resources needed to deliver a fully functioning agroforestry M&E. The Protect and Secure the System activity

takes security parameters from the Manage and Oversee the System activity for the Platform resources to minimize their vulnerability to both exploitation and attack, and to prevent unauthorized use. Both the Protect and Secure the System activity and the Control and Operate the System activity monitor the System for vulnerabilities and provide appropriate responses to detected incidents. The Control and Operate the System activity takes policy, guidance, and direction from the Manage and Oversee the System and works to ensure the delivery of the EbA Gambia platform. The Provide System Platform activity supplies the elements and components that underpin the tasks to catalogue EbA resources, collate EbA data, and report on project status and progress.



**Figure 2:** EbA Gambia conceptual framework (SLAs—service level agreements) (Gilruth et al, 2021).

# REFERENCES



## REFERENCES

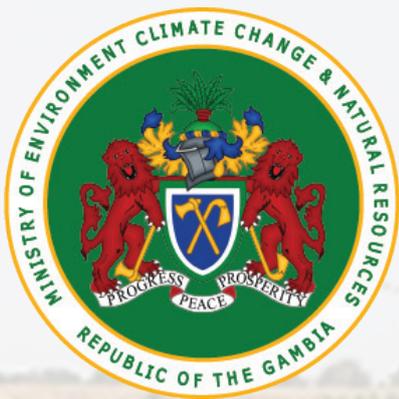
- Bah, A., Duguma, L., Minang, P., Muthee, K., Duba, D., Sanneh, E. and Jallow, P. (2021). Transhumance, Tree Growing and Ecosystem Resilience in The Gambia. ICRAF Technical Brief No. 02/2021. World Agroforestry, Nairobi, Kenya
- Camara, K. and Dampha, A. (2007). Trends in forest ownership, forest resources tenure and institutional arrangements: Are they contributing to better forest management and poverty reduction? A case study from The Gambia. Forest Tenure Assessment. FAO, Rome, Italy. 26 p
- Carloni, A. (2005). Rapid guide for missions: Analysing local institutions and livelihoods guidelines. FAO, Rome
- Constitution of the Republic of The Gambia (1997). Available at: <https://www.refworld.org/docid/4811c33f2.html> [accessed 6 April 2022]
- Duguma LA, Borona P, Minang PA, Nzyoka J, Bah A, Gilruth P, Makui P, Carsan S, Kindt R, Foundjem D, Baldeh F, Ahmad M, Wanjara J, and Mwangi SK. (2020). Diagnostic and a Baseline Study for Implementing Ecosystem-based Adaptation in Rural Landscapes of The Gambia. Nairobi: World Agroforestry
- Duguma, L.A., Nzyoka, J., Minang, P.A. and Bernard, F. (2017). How Agroforestry Propels Achievement of Nationally Determined Contributions. ICRAF Policy Brief no. 34. World Agroforestry Centre, Nairobi, Kenya
- Economic Commission for Africa (2017). Country profile 2016, The Gambia. United Nations Economic Commission for Africa. P:48, ISBN: 978-99944-68-94-2
- GBoS (2012). The Gambia Multiple Indicator Cluster Survey 2010. MICS Final Report. The Gambia Bureau of Statistics (GBOS): Banjul, The Gambia.
- Gilruth, P., Duguma, L.A., Minang, P.A., Bah, A., Jaiteh, M.S., Mwangi, S. and Ahmad, M. (2021). A Framework for Monitoring Ecosystems-Based Adaptation to Climate Change: Experience from The Gambia. *Sustainability*, 13, 10959. <https://doi.org/10.3390/su131910959>.
- Government of The Gambia (1998): The Forest Act 1998. <http://extwprlegs1.fao.org/docs/pdf/gam19052.pdf>[accessed 6 April 2022]
- Hamidian, A., Zehtabyan, G. and Khosravi, H. (2011). Socio-Economic Benefits of Agroforestry for. 1st National Conference of New Approaches in Natural Resources Sustainable Management.
- King, K.F.S. (1987). The history of agroforestry. In: Steppeler, H.A. and Nair, P.K.R. (eds.), *Agroforestry: A Decade of Development*, pp. 1-11. ICRAF, Nairobi, Kenya.
- Leakey, R.R.B. (2017). Definition of agroforestry revisited. In: *Multifunctional Agriculture – Achieving Sustainable Development in Africa*, RRB Leakey, 5-6, Academic Press, San Diego, California, USA.

- Leakey, R.R.B. (1996). Definition of agroforestry revisited, *Agroforestry Today*, 8(1), 5-7.
- Millennium Ecosystem Assessment. (2005). *Ecosystems and Human Well-Being: Synthesis*. Island Press.
- Van Noordwijk, M. (Ed). (2019). *Sustainable development through trees on farms: Agroforestry in its fifth decade*. Bogor, Indonesia: World Agroforestry (ICRAF).
- Muthee, K., Duguma, L., Nzyoka, J. and Minang, P. (2021). Ecosystem-based adaptation practices as a nature-based solution to promote water-energy-food nexus balance. *Sustainability*, 13(3), 1142. <https://doi.org/10.3390/su13031142>
- Nair, P.K.R. (1984). Tropical agroforestry systems and practices. In: Furtado, J.I and Ruddle, K. (Eds). *Tropical Resources Ecology and Development*. John Wiley, Chichester, England.
- Nair, P.K.R. (1993). *An introduction to agroforestry*. Dordrecht, The Netherlands: Kluwer Academic Publishers
- Shono, K., Cadaweng, E. and Durst, P. (2007). Application of assisted natural regeneration to restore degraded tropical forestlands. *Restoration Ecology*, 15(4): 620-626. DOI: <https://doi.org/10.1111/j.1526-100X.2007.00274>.
- Steppler, H. and Nair, P.K.R. (Eds.) (1987). *Agroforestry a decade of development*. Nairobi, Kenya: ICRAF
- Thoma, W., & Camara, K. (2005). *Community Forestry Enterprises: A case study of The Gambia*. Rome: Food and Agriculture Organization of the United Nations.
- UNDP & GoTG (2012). *An assessment of investments and financial flows in The Gambian Forestry Sector*. United Nations Development Program; Government of The Gambia
- van Noordwijk, M. (Ed). (2019). *Sustainable development through trees on farms: Agroforestry in its fifth decade*. Bogor, Indonesia: World Agroforestry (ICRAF).









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