



TÍTULO

**A ROADMAP TOWARDS A NON-DETRIMENT FINDING FOR
“PTEROCARPUS ERINACEUS” IN SIERRA LEONE**

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MANAGEMENT AND CONSERVATION OF SPECIES IN TRADE
THE INTERNATIONAL FRAMEWORK (14th edition)

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Master's Thesis

**“A ROADMAP TOWARDS A NON-DETRIMENT FINDING FOR
Pterocarpus erinaceus
IN SIERRA LEONE”**

For the award of the UNIA Master's Degree in the Management and Conservation of Species in
Trade The International Framework (14th edition)

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ABSTRACT

Developing a roadmap towards a Non-Detriment Finding for *Pterocarpus erinaceus* in Sierra Leone is viewed as a critical and timely intervention for Sierra Leone and other range state who may want to conduct a NDF for the above-named species and other CITES's listed species. It should serve as a guide, steps and directive that could help in the development of a non-detriment finding for the sustainable harvesting and exportation of *Pterocarpus erinaceus* in accordance with recommendations under Review of Significant Trade (RST) process in line with Resolution Conf. 12.8 (Rev. CoP18).

The goal of this research intervention was to develop a roadmap that can inform the development of a non-detriment findings on *Pterocarpus erinaceus* in Sierra Leone and other range state.

This roadmap is applicable to any other CITES' listed Species.

To this end, the specific objectives were:

1. Conduct a systematic review of existing knowledge on ecology, trade volumes, threats, and legislation on *P. erinaceus* in Sierra Leone.
2. Establish progress and constraints in implementing recommendations for sustainable management of *P. erinaceus* from previous studies, and from CITES; and
3. Define a roadmap towards producing NDFs for *P. erinaceus* in Sierra Leone and improve compliance with CITES.

To get the desired result expected, a diversified research tools and, methodologies were used including desk review, checklist and questionnaire design approach supported by field visit and observation of the areas where the species is found, review of data on trade volume from internet and CITES trade database. It further shifted to review of previous inventory work and maps to serve as guide in the selection of the study area. etc.

Based upon the research findings and literature works reviewed, it was noted that the species in question is indeed harvested without reference to size, height etc. The roadmap shows the above component as missing links for a Non-Detriment finding for *Pterocarpus erinaceus*. No documented research work has ever been conducted in this country on this species to show the species spread, local use, threats, facing it. The only documented but unpublished academic research work that was conducted by Foray-Musa was not detailed enough to capture the species' location, spread, characteristics or threats.

From the research findings it was noted that species exists in all the communities where data was collected. It also revealed that a good number of the people were involved in the harvesting. From field visit, the species was observed to be in patches and not spread across the entire landscape where it is found. The research discovered that people are not only aware about the species but could identify it in their different dialects and is under threat. Most of the species with large girth of DBH above 10cm have been logged. Most of the communities became aware about CITES when the suspension to export came into effect. The research revealed that bylaws are more effective in the sustainable management of natural resources include the species in question. However, it was discovered that its spread and dominance is greatly hampered by the yearly bush fires common in the region where it exists. Some of those interviewed opted for the suspension due to the lack of benefit and corporate social responsibilities from some companies for the communities. To regulate the trade in a sustainable manner, many requested for value-added wood manufacturing industry. With reference to trade data, there seems to high discrepancies between the data provided by the exporting country or the agent compared to the one provided by the importing country as found in CITES' trade database.

With reference to the implementation of previous recommendations, it was noted that many of the recommendations from previous studies were not implemented.

The roadmap revealed critical gaps and proposed measures that should be taken to ensure trade in the species is not detrimental to its survival. It proposed to the SA to follow the nine steps plan for the NDF. Capacity building and awareness raising were key recommendations advanced by the exporting country. Artificial propagation was also proposed to be instituted by both the public and private sector. It was also recommended that the SA intensify research and embark upon a detailed and comprehensive inventory of the species. Developing country's database of CITES' species, drafting bylaws, review of forestry legal instrument incorporated with the Convention were also proposed. The research also came up with a ten-points plan for the NDF.

Keywords: *Pterocarpus erinaceus*, Non-Detriment Finding, Sierra Leone

ACRONYMS

CBD	Convention on Biological Diversity
CCSL	Conservation Society of Sierra Leone
CITES	Convention on International Trade in Endangered Species
COP	Conference of Parties
DBH	Diameter at Breast Height
EA	Enforcement Authority
EPA-SL	Environment Protection Agency-Sierra Leone
FAO	Food and Agricultural Organization
FD	Forestry Department
GoSL	Government of Sierra Leone
IUCN	International Union for the Conservation of Nature
MA	Management Authority
MAFFS	Ministry of Agriculture Forestry and Food Security
MDAs	Ministries Department and Agencies
MOECC	Ministry of the Environment and Climate Change
NDC	Nationally Determine Contribution
NDF	Non-Detriment Finding
NFI	National Forest Inventory
NGOs	Non-Governmental Organizations
NPAA	National Protected Area Authority
NTFP	Non-Timber Forest Product
RAP-SL	Reptiles and Amphibians Program Sierra Leone
RST	Review of Significant Trade
SA	Scientific Authority
SLARI	Sierra Leone Agriculture Research Institute
SLP	Sierra Leone Police
UNODC	United Nations Office on Drugs and Crime

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CHAPTER ONE

BACKGROUND AND INTRODUCTION

1.1 Background to the country context

Located in the west coast of Africa, Sierra Leone surface area is about 71,740 square kilometers (72 million hectares). Classified amongst the Least Developed Country and one of the poorest countries in the world, the country is already being greatly affected by climate change. Gabler, Robert E et. Al (2006)) In Sierra Leone, climate change risks encountered are often triggered by human-induced activities such as unsustainable land use practices, deforestation, illegal exploitation, and trade in endangered or threatened species, forest degradation, mining, non-renewable energy use, unsustainable and unfriendly environmental practices (Blinker, 2006).

Due to the uncontrolled activities of the past years to date, Sierra Leone continues to experience erratic rainfall patterns, rise in atmospheric temperature, yearly uncontrolled bush fires, flooding, and reduction in the quantity and quality of water (McSweeney *et al.* 2006). According to the United Nation's Bulletin on Climate Action for Sierra Leone (2022), Sierra Leone is amongst the 10% most vulnerable country to climate impact globally. In 2018, it was ranked by The Notre Dame Global Adaptation Initiative (ND-GAIN) Index as the 21st most climate vulnerable country and the 50th least ready country in the world. All its major climate vulnerabilities for the country are outlined and summarized in the Sierra Leone's Nationally Determined Contributions (NDC, 2022).

According to the 2022 Housing and Population Census, Sierra Leone has a population of about 7.2 million people and projected to grow to 10 million by 2026. This current population growth and the projected future population estimate should be a concern to all considering the small and fixed land space. While the country's population keeps increasing yearly, the land space remains the same. At the same time, the forests and other vegetation that cover this fixed land space and the wildlife and biodiversity that depends and survives from it continue to decline at an alarming rate. In Sierra Leone, forests, wildlife, and other biodiversity are severely impacted by climate change with increased storm surges, flash floods, uncontrolled bush fires and high winds. The major challenges facing forest, wildlife and other biodiversity conservation include poor governance,

outdated laws, weak law enforcement, illegal harvesting and exportation, weak collaboration and conflicting mandates of the various Ministries, Department and Agencies (MDAs), low capacity to access climate and biodiversity financing etc. Deforestation and forest degradation also increases both landslides and floods, by removing tree roots that stabilize the ground. In the past decade alone, depletion of the forest reserve for agrarian-farming activities, human settlement, biofuel and timber exportation has resulted in losing almost 20,000 hectares of forest cover spanning between Sierra Leone and Liberia (Gola Rain Forest, National Park, 2021).¹

1.2 CITES' Mandates and Organizational Structure

1.2.1 Mandates of CITES

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between governments to protect endangered plants and animals. Its aim is to ensure that international trade in specimens of wild animals and plants do not threaten their survival. As a result of growing global environmental awareness, and growing concern about the threats that international trade posed to many species, the idea for a multilateral Convention concerning trade in endangered species was formulated in the 1960s under the umbrella of International Union for the Conservation of Nature (IUCN) – The World Conservation Union. This culminated in the drafting of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which was signed by 85 countries during 1973 conference in Washington. It entered into force in 1975 and currently has 184 Parties. While it is widely understood that habitat decline is the primary cause of endangerment for most species, trade in species, or parts of species, is a major cause of decline for some groups of animals and plants. Heinen *et al.* (2013). The trade in wild fauna and flora extends across borders of countries; hence, effort to regulate it requires international cooperation to protect certain species from over-exploitation and extinction.

In accordance with Articles III and IV of the Convention, export permits for specimens of species included in Appendices I and II shall be granted only when a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of the species (a

¹ [Gola Rainforest National Park](#)

determination known as a 'non-detriment finding' or NDF). Article III states that the import of specimens of Appendix I-listed species requires import permits that shall only be granted when a SA of the State of import has advised that the import will be for purposes, which are not detrimental to the survival of the species involved.

Article IV furthermore requires that a SA monitors exports of specimens of Appendix II-listed species and, whenever necessary, advises the Management Authority of suitable measures to be taken to limit such exports in order to maintain such species throughout their range at a level consistent with their role in the ecosystems and well above the level at which they would qualify for Appendix I.

The Resolution Conf. 16.7 (Rev. CoP17) on Non-detriment findings recommends that a non-detriment finding for an Appendix-I or -II species is the result of a science-based assessment that verifies whether a proposed export is detrimental to the survival of that species or not. NDFs should consider whether the species would be maintained throughout its range at a level consistent with its role in the ecosystems in which it occurs. The Resolution also recommends concepts and non-binding guiding principles that Scientific Authorities should consider when considering whether trade would be detrimental to the survival of a species, including data and information requirements, methodologies, species monitoring and management, and relevant sources of information.

1.2.2 Status of CITES implementation in Sierra Leone

Sierra Leone is a signatory to series of regional and international laws, conventions, protocols, principles and regulations on forestry, land use, climate change and biodiversity conservation including the Convention on International Trade in Endangered Species (CITES). This bold step taken by the government in signing and ratifying the CITES shows the country's commitment to regional and international treaties, protocols, and conventions.

However, signing and ratifying this convention and setting up the various structures are just one side of the coin but embedding it in related national legislations and enforcing implementation and compliance are also another side.

The Forest related Legislations such as the 1988 Forestry Act, Forest Regulation 1990, 1972 Wildlife and Conservation Act and 2010 Forest Policy are outdated and do not address emerging issues. However, these laws are being reviewed holistically to capture CITES related issues.

Another action the government has taken is to create awareness on CITES at higher level with the government and some entities, community, and non-state actors. To increase capacity, knowledge and awareness about CITES, a capacity training was conducted for Lawyers and Judges on CITES mandates, standards, obligations and requirement by Born Free through support from West Africa Biodiversity and Low Emission Development for Ghana and The Gambia from the 15th -17th August, 2022 and from the 10th -12th May, 2022 in Liberia. (Sanon, 2022).

1.2.2.1 Designation and role of the Management Authority in Sierra Leone

Regarding the designation of MA. The COP resolves that:

- a) each Party designates its MA by a legal instrument or administrative act; ensures that those MAs have the necessary powers to carry out their responsibilities; and separates the functions of the Management Authorities and the Scientific Authorities;
- b) upon designation, Parties communicate through the Minister of Foreign Affairs, the competent Minister or the Permanent Mission, the name and contact details of the designated Management Authorities to the Secretariat for transmission to all other Parties and inclusion in the directory of national CITES Authorities;
- c) in cases where more than one MA is designated, Parties appoint the Management Authority authorized to communicate officially with the Secretariat and other Parties on the matters mentioned in paragraphs 7, 8, 15 and 19 below;
- d) changes in the designation of MA may only be notified through the Minister of Foreign Affairs, the competent Minister or the Permanent Mission; and
- e) changes of contact details and personnel may be notified by the Head of the MA authorized to communicate officially with the Secretariat and will be reflected in the directory of national CITES Authorities;

Encourages Parties, when adopting national legislation designating MA, to use the draft model law on international trade in wild fauna and flora provided by the CITES Secretariat;

Regarding the issuance of permits and certificates, Reminds Parties that the specific functions of MA regarding the issuance of permits and certificates include, but are not limited to, the following:

a) issuing export and import permits and certificates for specimens of species included in Appendix I, II and III in accordance with the Convention and relevant Resolutions, in particular Resolution Conf. 12.3 (Rev. CoP19) 2 on Permits and certificates, Resolution Conf. 9.6 (Rev. CoP19) 3 on Trade in readily recognizable parts and derivatives and Resolution Conf. 5.10 (Rev. CoP19) 4 on Definition of ‘primarily commercial purposes’;

b) before issuing permits and certificates, determining in accordance with Articles III, IV and V of the Convention and relevant Resolutions, in particular Resolution Conf. 18.7 (Rev. CoP19)5 on Legal acquisition findings, that the specimen was not obtained in contravention of the laws for the protection of fauna and flora of the exporting State;

c) before issuing permits and certificates, obtaining the advice from the Scientific Authority in accordance with the Convention and relevant Resolutions on the following:

i) that trade would not be detrimental to the survival of a species, in accordance with the Convention and Resolution Conf. 16.7 (Rev. CoP17) on Non-detriment findings, as appropriate;

ii) the suitability of the recipient to house and care for live specimens of Appendix I species being imported or introduced from the sea and those Appendix-II populations of elephants and rhinoceros subject to Resolution Conf. 11.20 (Rev. CoP18) on Definition of the term ‘appropriate and acceptable destinations’;

iii) whether or not scientists or scientific institutions seeking registration for the purpose of being issued labels for scientific exchange meet the criteria established in Resolution Conf. 11.15 (Rev. CoP18) on Non-commercial loan, donation or exchange of museum, herbarium, diagnostic and forensic research specimens, and other standards or any stricter national requirements; and iv) whether the facility concerned meets the criteria for producing specimens considered to be bred in captivity or artificially propagated in

accordance with the Convention and relevant Resolutions, when reviewing all applications submitted for consideration under Article VII, paragraph 4 or 5;

d) when issuing an introduction from the sea certificate or an import or export permit authorizing trade in specimens of species included in Appendix I or II taken in the marine environment not under the jurisdiction of any State, taking into account whether the specimens were acquired or will be landed in a manner consistent with applicable measures under international law for the conservation and management of living marine species; or through any illegal, unreported or unregulated fishing activity, in accordance with Resolution Conf. 14.6 (Rev. CoP16) on Introduction from the sea;

e) determining the applicability of exemptions or special provisions relating to trade in accordance with Article VII of the Convention, and in accordance with relevant Resolutions, in particular Resolution Conf. 9.7 (Rev. CoP15) on Transit and transshipment, Resolution Conf. 9.19 (Rev. CoP15) on Registration of nurseries that artificially propagate specimens of Appendix-I plant species for export purposes, Resolution Conf. 10.16 (Rev. CoP19) 6 on Specimens of animal species bred in captivity; Resolution Conf. 10.20 on Frequent cross border movements of personally owned live animals, Resolution Conf. 11.15 (Rev. CoP18) on Non-commercial loan, donation or exchange of museum, herbarium, diagnostic and forensic research specimens, Resolution Conf. 12.3 (Rev. CoP19) on Permits and certificates, Resolution Conf. 12.10 (Rev. CoP15) on Registration of operations that breed Appendix-I animal species in captivity for commercial purposes, Resolution Conf. 13.6 (Rev. CoP18) on Implementation of Article VII, paragraph 2, concerning 'pre-convention' specimens, Resolution Conf. 13.7 (Rev. CoP17) on Control of trade in personal and household effects, and Resolution Conf. 16.8 (Rev. CoP17) on Frequent cross-border non-commercial movements of musical instruments;

f) determining that living specimens will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment in accordance with the Convention and Resolution Conf. 10.21 (Rev. CoP19) 7 on Transport of live specimens;

g) monitoring the management of each captive-breeding operation under its jurisdiction, in collaboration with the Scientific Authority, in accordance with Resolution Conf. 12.10 (Rev. CoP15) on Registration of operations that breed Appendix-I animal species in captivity for commercial purposes; recognising that this may involve inspecting and monitoring captive

breeding operations and nurseries to confirm the identity and legal origin of the parental stock and to detect the presence of unauthorized specimens held at or exported by the operation;

h) for Appendix-I species, i) determining that the specimen is not to be used for primarily commercial purposes before issuing import permits and introduction from the sea certificates; ii) determining that the specimen was imported into the State in accordance with the provisions of the Convention before issuing re-export certificates; and iii) checking permits and certificates for errors and inconsistencies, consulting the list of trade suspensions on the CITES website, and liaising with other MA or the Secretariat about any issues related to permits and certificates;

As enshrined in Articles I to IX of 2006 CITES' regulation, the role of the head of the MA is to issue permits in line with the CITES Convention and legal channel of Communication on all CITES related issues in the country with guidance from the SA as required by CITES. The MA should also review all applications for CITES Permits, communicate with CITES Secretariat and other countries MAs on scientific, enforcement and administrative matters, coordinate with districts, Local councils and other ministries, departments, and agencies on CITES matters, such as the status of native species, development of policies, negotiating positions, and law enforcement activities, communicate with the SA, the public, and media about CITES issues, conduct public meetings and publish notices to gather input from the public on the administration of CITES and the conservation and trade status of domestic and foreign species traded internationally, represent the country at the international meetings of the Conference of Parties (CoP) meetings, and on CITES working groups, consult with other countries on CITES issues and the conservation status of species, prepare discussion papers and proposals for new or amended resolutions and species listings for consideration at the Conference of Parties (CoP) monitors trade in all CITES species and produce annual and biennial reports to the Secretariat, organize communication and public enlightenment campaigns on CITES Implementation, register and conduct periodic check of captive breeding operations, private Zoos and artificial propagation operations of wild fauna and flora in CITES appendix I. Other functions include retaining, cancelling export permit or re-export certificate and any corresponding import permit presented with imports; marking specimens, determining the applicability of exemptions, confiscate live specimens, communication with the Secretariat and other Parties. The MA also prepares and circulates official information on CITES to customs, other border authorities, Interpol; and relevant government ministries (John, 2019).

Sierra Leone became a Party to the Convention on the 28th of October of 1994 and entered into force on 26th of January of 1995. It was anchored in the Forestry Division now Forestry Department which was under the Ministry of Agriculture, Forestry and Food Security but now under a new ministry, the Ministry of the Environment and Climate Change. The Forestry Department is responsible for the protection and management of Community Forests, Forest Reserves, Forest corridors, issuance of logging permit and licenses etc. Since the adoption and ratification of the Convention, the MA has vested in the Forestry Department of the Ministry of Agriculture, Forestry and Food Security. The MA was and still under the Forestry Department at the time of this research.

1.2.2.2 Designation and role of the Scientific Authority in Sierra Leone

The Conference of Parties recommends that:

- a) all Parties designate Scientific Authorities independent from Management Authorities;
- b) Parties not accept export permits from countries that have not informed the Secretariat of their Scientific Authorities for more than one interval between regular meetings of the Conference of the Parties;
- c) Management Authorities not issue any export or import permit, or certificate of introduction from the sea, for species listed in the Appendices without first obtaining the appropriate Scientific Authority findings or advice;
- d) Parties enlist the assistance of Scientific Authorities of other Parties, as appropriate;
- e) neighbouring Parties consider sharing their resources by supporting common scientific institutions to provide the scientific findings required under the Convention;
- f) the Parties consult with the Secretariat when there is reason for concern as to whether the proper Scientific Authority findings are being made;
- g) the appropriate Scientific Authority advise on the issuance of export permits or of certificates for introduction from the sea for Appendix-I or -II species, stating whether or not the proposed

trade would be detrimental to the survival of the species in question, and that every export permit or certificate of introduction from the sea be covered by Scientific Authority advice;

h) the findings and advice of the Scientific Authority of the country of export be based on the scientific review of available information on the population status, distribution, population trend, harvest and other biological and ecological factors, as appropriate, and trade information relating to the species concerned;

i) the appropriate Scientific Authority of the importing country advise on the issuance of permits for the import of specimens of Appendix-I species, stating whether the import will be for purposes not detrimental to the survival of the species;

j) the appropriate Scientific Authority monitor the status of native Appendix-II species and export data, and recommend, if necessary, suitable remedial measures to limit the export of specimens in order to maintain each species throughout its range at a level consistent with its role in the ecosystem and well above the level at which the species might become eligible for inclusion in Appendix I;

k) the appropriate Scientific Authority either make the findings required on the suitability of the recipient to house and care for live specimens of Appendix-I species being imported or introduced from the sea, or make its recommendations to the Management Authority prior to the latter making such findings and the issuance of permits or certificates;

l) the appropriate Scientific Authority provide advice to its Management Authority as to whether or not scientific institutions seeking registration for the purpose of being issued labels for scientific exchange meet the criteria established in Resolution Conf. 11.15 (Rev. CoP18) 6, and other standards or any stricter national requirements;

m) the appropriate Scientific Authority review all applications submitted for consideration under Article VII, paragraph 4 or 5, and advise its Management Authority as to whether the facility concerned meets the criteria for producing specimens considered to be bred in captivity or artificially propagated in accordance with the Convention and relevant Resolutions;

n) the appropriate Scientific Authority gather and analyse information on the biological status of species affected by trade to assist in the preparation of proposals necessary to amend the Appendices; and

o) the appropriate Scientific Authority review proposals to amend the Appendices submitted by other Parties and make recommendations as to how the delegation of its own country should address each proposal;

The role of the SA is to advise the MA whether export of specimens would be detrimental to the survival of the species in the wild, determine that the export of specimens of species included in Appendices I and II is not detrimental to their survival, importation of specimens of a species included in Appendix I is not detrimental to its survival, intended recipient of live Appendix-I specimens is suitably equipped to house and care for them, introduction from the sea would be detrimental to the survival of the species involved, monitor export permits granted and actual exports to ensure that the species is maintained at a level consistent with its role in the ecosystems in which it occurs, avoid an Appendix-I listing, provide advice as to whether or not scientific institutions seeking registration meet the criteria established in Resolution Conf. 11.15 (Rev. CoP12), review applications submitted under Article VII, paragraphs 4 or 5 (is the facility capable of captive breeding or artificial propagation) and in Resolution Conf. 12.10 (Rev. CoP15), gather and analyse information on the biological status of species affected by trade to assist in the preparation of proposals to amend the Appendices. Before making a decision on the disposal of confiscated live specimens, the MA must consult with and obtain advice of its own SA determining the national status of CITES species (CITES Secretariat, 2006).

Since the introduction of CITES implementation in Sierra Leone, the SA has and is still vested in the Faculty of Pure and Applied Sciences Fourah Bay College, University of Sierra Leone. The university is supposed to conduct research and assessment in the various CITES domains. The SA normally collaborate with the Faculty of Natural Resources Management at the Njala University, the Sierra Leone Agriculture Research Institute (SLARI) Fisheries and any other depending upon the area of research involved in wildlife and forest.

1.2.2.3 Enforcement Authority. Duties and status in Sierra Leone

Since CITES does not work in isolation but coordinate, collaborate and link with national entities, the enforcement of laws and conventions signed by different parties are enforced by the local institutions already set in those countries. The mandate and responsibility to investigate alleged criminal activity therefore rest squarely with those structure set up by the respective government. The Secretariat has no authority to investigate and prosecute offenders as part of its mandate at national level but works with already established national bodies (CITES Secretariat, 2006). In situation where issues can be reported, the following email can be used to report²

In Sierra Leone, the Interpol Department of the Sierra Leone Police is the Enforcement Authority (EA), that investigate alleged criminal activities and make arrest where necessary.

1.3 CITES and the Non-Detriment Findings

Article III states that the import of specimens of Appendix I-listed species requires import permits that shall only be granted when a Scientific Authority of the State of import has advised that the import will be for purposes, which are not detrimental to the survival of the species involved. Article IV furthermore requires that a Scientific Authority monitors exports of specimens of Appendix II-listed species and, whenever necessary, advises the Management Authority of suitable measures to be taken to limit such exports in order to maintain such species throughout their range at a level consistent with their role in the ecosystems and well above the level at which they would qualify for Appendix I.

In accordance with Articles III and IV of the Convention, export permits for specimens of species included in Appendices I and II shall be granted only when a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of the species (a determination known as a 'non-detriment finding' or NDF).

Several Resolutions among others provide advice on NDFs: Conf. 16.7 (Rev. CoP17) Non-detriment findings; Conf. 10.3 Designation and role of the Scientific Authorities; Conf. 13.2 (Rev.

² info@cites.org

CoP14) Sustainable use of biodiversity: Addis Ababa Principles and Guidelines; Conf. 14.7 (Rev. CoP15) Management of nationally established export quotas.

The Resolution Conf. 16.7 (Rev. CoP17) on NDFs has special relevance and recommends that a non-detriment finding for an Appendix-I or -II species is the result of a science-based assessment that verifies whether a proposed export is detrimental to the survival of that species or not. NDFs should consider whether the species would be maintained throughout its range at a level consistent with its role in the ecosystems in which it occurs. The Resolution also recommends concepts and non-binding guiding principles that Scientific Authorities should consider when considering whether trade would be detrimental to the survival of a species, including data and information requirements, methodologies, species monitoring and management, and relevant sources of information.

The correct implementation of an NDF allows for sustainable trade. There are several methodologies that can be used to make an NDF, species.³

One of them is “CITES Non-detriment Findings for Timber. A nine-step process to support CITES Scientific Authorities making science-based non-detriment findings (NDFs) for timber / tree species listed in CITES Appendix II Version 3.0” by Wolf, Oldfield and McGough (2018).⁴

The Figure 1 below provides summary of the nine steps to consider in conducting NDF for any Species on CITES’ listing under Appendix I and II. Depending upon previous review works and the outcome of those research work as defined under steps 1 to 3, the country may move to step nine. However, if the result provided under step 1 to 3 and not convincing, the country may be required to go through all the nine steps.

³ <https://cites-tsp.org/resources/guidelines>

⁴ <https://cites-tsp.org/resources/guidelines>

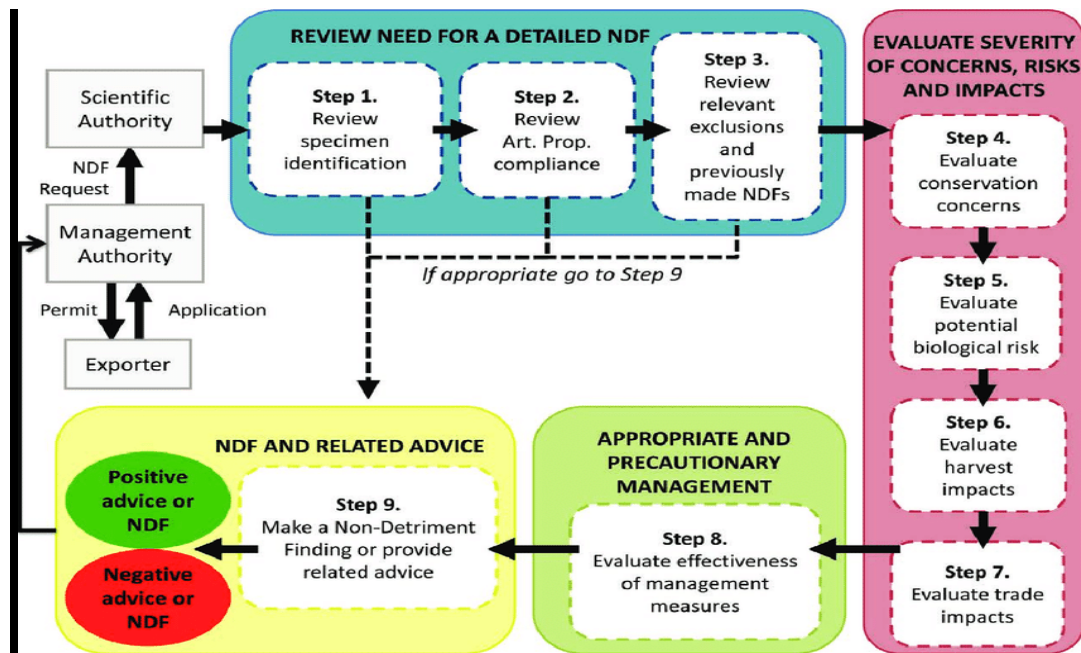


Figure 1: NDF nine steps (Source: Bundesamt für Naturschutz (BfN), Federal Agency for Nature Conservation
 URL: <http://www.bfn.de>)

1.4 CITES and the Review of Significant Trade

The Review of Significant Trade (RST) was designated to identify species that may be subject to unsustainable levels of international trade and identify problem and solutions concerning effective implementation of the Convention.

To ensure effective monitoring and compliance, the Conference of the Parties to the CITES mandated the Animal and Plants Committees to regularly undertake Review of Significant Trade (RST) in co-operation with the Secretariat and experts and in consultation with range States. The RST procedure is applied when trade in a species is suspected to be unsustainable and a threat to wild populations. It allows the review of biological, trade and other relevant information on Appendix II species subject to significant levels of international trade. RST helps identified species listed in Appendix II that are impacted by international trade. The Resolution Conf. 12.8 was adopted in the COP12 [Resolution Conf. 12.8 (Rev. CoP18)], which led to the designing of RST to help identify species listed in Appendix II that are impacted by unsustainable level of international trade. The resolution also identified problems and solutions that could help in the effective implementation of Article IV paragraph 2a, 3 and 6a). At Cop 19, the Secretariat launched the online RST Management System, a tool to track progress of species selected by countries

through the four stages of the Significant Trade Review. As an online management tool, it helps to effect CITES implementation and promote transparency of the process. The RST system works on those cases within CITES where there is concern that trade could affect the viability of a specific species from a specific country.⁵

1.5 *Pterocarpus erinaceus* and Sierra Leone. Nature of the problem

Pterocarpus erinaceus is found mainly in the Northern and Northwest regions and part of the Kono district in the Eastern Region. However, few are found in some part in the Western Area, Moyamba and Bo districts and in areas that borders with the regions above. The districts where it is found include: Portloko, Kambia, Karene, Bombali, Falaba, Koinadugu, Tonkolili and Kono (Figure 2).

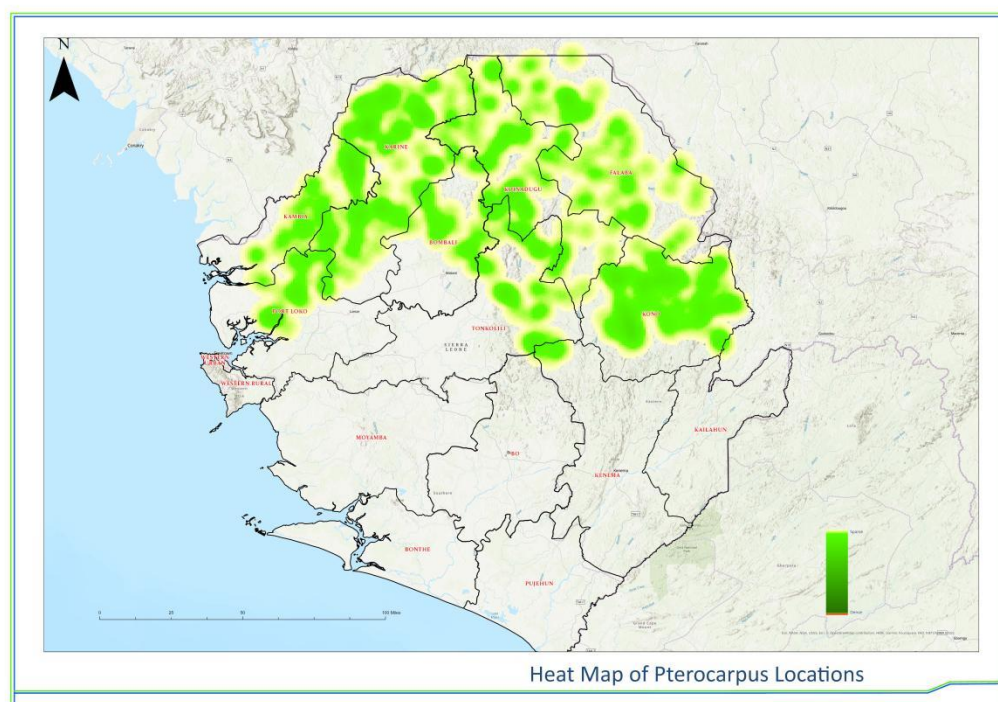


Figure 2: Heat map of NDF Survey on *Pterocarpus erinaceus* by SA Source: Sierra Leone's NDF, 2022

From general knowledge, *Pterocarpus erinaceus* species was not of any international value in Sierra Leone before the ten years civil war in 1991. Before and during those years of the war, this species was flourishing and increasing rapidly in girth, height, regenerating and coppicing when

⁵ <https://cites.org/eng/imp/sigtradereview>

the threats to its survival entered the race. Its uses were localized and not of international scale. Immediately after the war, the trend changed. Exposure to Chinese influence led to discovery of this species as rosewood which increased its value in the international trade. To win government to commit to the trade in this species, the Chinese government often support huge development projects in exchange for the trading of this species. Sierra Leone started exporting this species informally in 2004 during the reign of the first post war government. It was then intensified in 2007 when the governance system changed hands during the second post war transitional governance era. The trade continues even during the third post war government system in 2018. In 2019, International Union for the Conservation of Nature through its CITES' obligations and protocols realized the danger this species is facing especially in the absence of national or local laws to halt the logging and trading of this species. This led to the Review of Significant Trade (RST) which resulted in the suspension of the logging and exportation of this species.

The key summary of the problems include:

- Logging of *P. erinaceus* has been going on in Sierra Leone for about 9 years but recently government has put in place measures such as five months suspension on harvesting and transportation of the species.
- Few studies have been conducted between 2016 and 2019 (Foray-Musa, 2016 and Kamara, 2019), focusing respectively on policy and legislation, as well as on ecological sustainability of illegal trade activities and recommended priority interventions for addressing the issue.
- The ecosystem where this species is found in Sierra Leone is prone to yearly uncontrolled wildfires;
- A comprehensive and published scientific based research evidence does not exist on this species

In response to the exceptional circumstances of pervasive illegal trade in *Pterocarpus erinaceus*, in accordance with the Article XIII of the Convention, at its 74th meeting (SC74, Lyon, March 2022), the Standing Committee requested the Secretariat to open an expedite compliance procedure for *Pterocarpus erinaceus* for all range States. In response Sierra Leone submitted voluntary zero-export quota which has been published by the CITES Secretariat.

Also, Sierra Leone requested technical and financial assistance to conduct a scientific assessment to make an NDF for *Pterocarpus erinaceus*, as well as support for the creation of sustainable forestry solutions.

The Secretariat requested additional information from the MA of Sierra Leone on the current status of the development of the NDF and LAF to agree a roadmap for its completion with the Swiss funding. Sierra Leone submitted a letter, dated 15 September 2022, to the Secretariat requesting the Standing Committee to consider their request to export consignments of *Pterocarpus erinaceus* that were awaiting shipment as of 6 April 2022.

In accordance with the recommendations of the Standing Committee at SC74, the Plants Committee began a procedure for intersession decision-making in relation to RST of *Pterocarpus erinaceus*.

On 24 June 2022, the Plants Committee agreed that, in the context of paragraph 1 g) of Resolution Conf. 12.8 (Rev. CoP18), ‘action is needed’ concerning the implementation of Article IV, paragraph 2 (a) and 3 for *Pterocarpus erinaceus* in Sierra Leone (Notification No. 2022/050). The Plants Committee further agreed the time-bound, feasible, measurable, proportionate, and transparent recommendations directed Sierra Leone as follows:

Short term recommendations

Within 30 days (23-Jul-2022)

- a) Establish a zero-export quota for all trade in *Pterocarpus erinaceus* and communicate the quota to the Secretariat for publication on the national export quota section of the CITES website. This quota shall remain in place and be renewed annually until such time as applicable recommendations have been implemented;
- b) Prior to revising the zero export quota, communicate the basis for the non-detriment finding taking into account the concepts and non-binding guiding principles in Resolution Conf. 16.7 (Rev. CoP17) and in line with paragraph c), to the Secretariat and members of the Plants Committee through its Chair, for their agreement. No exports should occur until the quota has been published on the Secretariat’s website.

Long term recommendations Within two years (24-Jun-2024)

c) With the support of the Secretariat, in consultation with the Plants Committee, and taking account of regional and other expertise and experience, establish a science-based non-detriment finding considering the concepts and non-binding guiding principles in Resolution Conf. 16.7 (Rev. CoP17).

The non-detriment finding could, *inter alia* include the following elements:

- science-based studies on the status of the species (e.g. population size/ stem density, trends, DBH distribution, annual increment rates), for example as part of a national forestry assessment;
- national/and or local management plans (that include harvest management considerations) with clear monitoring requirements;
- adaptive management to ensure that further decisions about the harvesting and management of the species are based on monitoring results (regular review of harvest records and the impact of harvesting, and adjustment of harvest instructions as necessary);
- estimated sustainable harvest taking into account the population data and harvest pressure resulting from legal and illegal trade relative to the vulnerability of the species (intrinsic and extrinsic factors that increase the risk of extinction of the species);
- calculation of a proposed country-specific sustainable export quota including how the quota shall be allocated among management areas and information on the location and extent of those areas; and,
- clearly defined management measures (e.g., minimum rotation periods, minimum exploitable diameter, harvest maximums, best management practices for harvesting), as well as details of a locally appropriate traceability and effective monitoring system, including the development or sharing of identification materials.

d) Before making any increase to export quotas, communicate the scientific basis for such change to the Plants Committee, through its Chair, annually for a period of three years after exiting the Review of Significant Trade. No increases in export should occur until the quota has been published on the Secretariat's website.

During the seventy-fifth meeting of the Standing Committee, SC75 Doc. 7.2.1 (Rev. 1), in Panama City (Panama), 13 November 2022, the Secretariat recommended that the Standing Committee update the recommendations adopted at SC74 in the document SC75 Doc. 7.2.1 (Rev. 1)

Considering the discussions during the meeting, the Standing Committee took note of the desire of both Mali and Sierra Leone to have an expedited consideration of their request in the future to be allowed to export the considering their stockpiles harvested prior to the issuance of Notification to the Parties No. 2022/021. The following decisions were reached:

1. instructed the Secretariat to publish a Notification to the Parties to replace Notification No. 2022/045 of 8 June 2022, recommending that the Parties maintain the suspension of commercial trade in specimens of the species *Pterocarpus erinaceus* from Cameroon, the Central African Republic, Chad, the Gambia, Guinea-Bissau, Mali and Togo according to the expedited compliance procedure pursuant to Article XIII, until the following conditions are met:

a) The Party concerned makes scientifically based non-detriment findings for trade in the species in their countries to the satisfaction of the Secretariat and the Chair of the Plants Committee, having regard to Resolution Conf. 16.7 (Rev. CoP17) and based on the outcomes of the Review of Significant Trade process for this species; and

b) The Party provides evidence of adequate legal acquisition findings to the satisfaction of the Secretariat and the Chair of the Standing Committee, having regard to Resolution Conf. 18.7 (Rev. CoP18).

2. noted that the Review of Significant Trade process for *Pterocarpus erinaceus* and the resulting recommendations are covered in a separate document (SC75 Doc. 8).

3. requested that all CITES permits and certificates for *Pterocarpus erinaceus* be verified by the Secretariat prior to acceptance by importing Parties.

4. invited Parties to exercise due diligence [see Resolution Conf. 11.3 (Rev. CoP18)] and to not authorize the transit or import of any specimen if there is reason to believe that it is traded in contravention of the laws of any country involved in the transaction, or if there is reason to believe that the specimen accompanied by a CITES document may not have been traded in accordance with the provisions of the Convention.

5. requested Cameroon, the Central African Republic, Chad, the Gambia, Guinea Bissau, Mali and Togo to report on progress made in the implementation of recommendations 1 a) and b) 90 days before its 77th meeting, in order for the Secretariat to convey this report and any recommendations it may have to the 77th meeting of the Standing Committee.

6. instructed the Secretariat to provide, subject to external funding and upon request, capacity-building and training specific to the making of Non-Detriment Findings and Legal Acquisition

Findings in accordance with the provisions of the Convention to Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea Bissau, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

7. encouraged Parties affected by illegal trade in *Pterocarpus erinaceus*, to actively pursue the full implementation of the decisions on Wildlife crime enforcement support in West and Central Africa and the Task Force on illegal trade in specimens of CITES listed tree species to be adopted at CoP19, as relevant to addressing illegal trade in *Pterocarpus erinaceus* and applicable to them in their role as source, transit or destination country.

CHAPTER TWO

JUSTIFICATION AND OBJECTIVES OF THE THESIS

2.1 Justification

This research therefore seeks to provide a comprehensive roadmap for the Non-Detriment Finding currently going on in the country, with a view to contribute to the implementation of Review of Significant Trade in specimens of Appendix-II species (RST) recommendations for *Pterocarpus erinaceus*. Devising this roadmap towards national Non-Detriment Findings for the sustainable management, harvesting and trade in *Pterocarpus erinaceus* species in Sierra Leone is very crucial especially during this critical period of a battle between exploitation and economic growth. The need to do a Non-Detriment Findings and proposing a sustainable harvesting, management and regulatory framework is very crucial at this time.

2.2 Research Goal

The goal is to draft a roadmap for the formulation of a Non-Detriment Findings on *Pterocarpus erinaceus* currently going on in Sierra Leone, and in accordance with Article IV of CITES.

2.3 Research Objectives

The specific objectives of the study include:

1. Conduct a systematic review of existing knowledge on ecology, trade volumes, threats, and legislation on *P. erinaceus* in Sierra Leone.
2. Establish progress and gaps in implementing recommendations for sustainable management of *P. erinaceus* from previous studies, and from CITES.
3. Define a roadmap towards producing NDF for *P. erinaceus* in Sierra Leone and improve compliance with CITES provisions and compliance processes, including the review of significant trade process.

2.4 Research questions

Which are the knowledge and gaps of CITES compliance in the management of *Pterocarpus erinaceus* in Sierra Leone?

Which are the constraints towards CITES compliance in the management of *Pterocarpus erinaceus* in Sierra Leone?

Which are the opportunities for compliance in the management of *Pterocarpus erinaceus* in Sierra Leone?

Which are the challenges in realizing these opportunities?

What should be done by state and non-state actors to change the narrative for the better?

What can local authorities do to halt this local exploitation of the species?

Note that which is used in this context to refer to limited choice while what connotes bigger choice.

It is postulated therefore that the outcome of this research will help inform SA in drafting the NDF.

This will therefore lead to improving management and sustainability of *Pterocarpus erinaceus* populations in Sierra Leone.

CHAPTER THREE

LITERATURE REVIEW

3.1 *Pterocarpus erinaceus* species characteristics, habitat, and distribution

Pterocarpus erinaceus has been classed as a rosewood. From observation of the plant in the wild and as a slow-growing deciduous species, it often flowers when leafless at the start of the dry seasons mostly from December to February. During this period, *Pterocarpus erinaceus* develops new leaves though some do so together with the flowers. The flowers are much visited by bees, which are probably responsible for pollination. It has stiff bark, blackish and looks scaly with long shoot branches. Fruit body is bristly, fruits orbicular, broadly winged. The timber is yellowish in colour and the heartwood is yellowish brown to reddish brown. Its timber is very hard and strong and has beautiful colour.

As a rosewood species, *Pterocarpus erinaceus* is a native species in the semi-arid Sudan-Guinea savanna forests of West Africa. As a multi-use species in West Africa and a fire-resistant nitrogen-fixing species, it is reported to be in the following countries in West Africa namely: Senegal, Gambia, Guinea-Bissau, Guinea, Mali, Côte d'Ivoire, Burkina Faso, Ghana, Niger, Benin, Togo, Nigeria, and Cameroon GBIF, (2013).

3.2 Species status, trend and threats

There is at the moment, no empirical or quantitative data on the population of *Pterocarpus erinaceus* species, total area of relevant habitat and the average density of stems per hectare (Adjonou *et al.* 2010). Due to its various local utilization and despite the plasticity of the species, the impact of the exploitation of the populations of *Pterocarpus erinaceus* have been described in several countries in the region.

Pterocarpus erinaceus has been investigated to be exposed to strong anthropogenic pressure in its ecological habitat (Fontodji, 2015) due to the high technological performance of its. There has been a massive increase in the trade of *Pterocarpus erinaceus* timber due to rising demand in Asia especially China for rosewood furniture and increasing scarcity of other officially recognized 'rosewood' species (Treanor, 2015). Most of them are listed on the CITES Appendices. It is estimated that imports of the species logs into China have risen more than 2,000-fold, between the third quarter 2009 and the third quarter 2015, from 70 m³ to approximately 149,000 m³ (Treanor,

2015). Market analysis conducted shows that in 2014, 12 species of *Pterocarpus* were present in the commercial timber trade and in 2015 it was most traded species of Hongmu¹ at International trade level (Mark *et al.*, 2014).

Unless rapidly checked unsustainable exploitation of the species for international trade is likely to have serious negative impacts on the species itself, the ecology of the West African dry forests and the human populations who depend on them. for their livelihood. Due to the threats facing the species, biodiversity, and its ecosystem, all *Pterocarpus* species were placed under Appendix III of CITES (see Notification of the Parties No. 2016/008), which came into force on May 9, 2016.

3.3 Species harvesting and exploitation

Data collected from a number of range States suggest that a large percentage of the *Pterocarpus erinaceus* timber being exported to China and elsewhere is illegally harvested and/or illegally exported (Forest Trends, 2015). The seizure of more than \$216 million US dollars in illegally harvested rosewood principally *Pterocarpus erinaceus* followed by the arrest of 44 individuals involved in national or regional timber traffic (Interpol, 2015). With ban on international trade of *Dalbergia* species, the trade shifted to alternate species as replacements, particularly in the *Pterocarpus* genus (Winfield *et al.*, 2016). Stands of this Leguminous species are especially targeted for timber and fuel wood production, but this species has also several medicinal uses (Kokou *et al.*, 2011; Segla *et al.*, 2015). Its traditional medicine uses has increased in sub Saharan Africa. Treanor (2015) reported a higher figure of 151,037 m³ of rosewood logs emanating from Ghana to China in 2014. It has also been reported international trade in *Pterocarpus erinaceus* shows a considerable increase in export volume of its wood from West Africa countries for Asia, particularly China (Dumenu, 2019). Winfield *et al.* (2016) show that, since 2010, rosewood supply from Africa to China has experienced a 700% increase. This pattern is also applicable to Vietnam, where in 2013, 15.7% of the country's rosewood import (*Dalbergia* and *Pterocarpus*) were made up of African species.

Occurs in the north, northwest and east of Sierra Leone, in eight of the country's 16 administrative Districts. The population size was reported to be unknown. In one study area near the Guinean border, the species was considered abundant overall, but with fewer than expected trees in large size classes, and anecdotal evidence indicated that a decline in the country overall may be as high

as 80%. The country's National Biodiversity Strategy and Action Plan for 2017-2026 referred to the "devastating" effect of logging for *P. erinaceus* timber in woodlands in the north. A CITES annual report was received from Sierra Leone for 2016. Trade 2016-2018 predominantly consisted of 203 148 m³ and 2 877 500 kg of wild-sourced logs imported by China. Sierra Leone reported 3906 m³ of sawn wood exported to China for 2016. According to Chinese customs data from the Global Trade Atlas, rosewood logs imported by China from Sierra Leone over the period 2009-2018 totalled 403 463 m³. Sierra Leone was noted by UNODC to have become the largest exporter of rosewood in recent years. Sierra Leone responded to the consultation relating to the RST. A log export ban has been in place in Sierra Leone for over a decade but has been lifted intermittently to allow the export of pre-ban stockpiles. Some illegal logging of *P. erinaceus* has been reported from National Parks under the supervision of the National Protected Area Authority. A request for funding to establish an NDF was noted to have been submitted. Although a national ban on the harvest, transport and export of logs is in place, this ban does not appear to include processed wood and has also been lifted intermittently to allow export of stockpiled logs. Despite the high volumes of exports, Sierra Leone has not yet conducted a robust scientifically based non-detriment finding (NDF) for *P. erinaceus*. On this basis, *P. erinaceus* from Sierra Leone is categorized as Action is needed. The illegal trade and export of timber without CITES documentation is a concern not related to the implementation of Article IV, therefore it may be relevant to consider referral to the Standing Committee.⁶

Based upon the illegal harvesting and trade in *Pterocarpus erinaceus*, the CITES Standing Committee 74 endorsed and applied Article XIII compliance procedure for the species on the 28 March 2022. This was followed by CITES Secretariat issuing Notification 2022/021 (CITES, 2022).

3.4 Species regeneration and propagation

Research conducted by Ouinsavi *et al.* (2019) showed that stem cuttings of *Pterocarpus erinaceus* can be used to propagate the species successfully. Habou *et al.* in 2017 in research on vegetative propagation - by aerial layering of *Pterocarpus erinaceus* in the Sudanian zone in Burkina Faso - using two trials discovered that the rooting rate is higher in the proximal air layers with a diameter

⁶ <https://cites.org/sites/default/files/eng/com/pc/25/Documents/E-PC25-15-05.pdf>

between 2 and 3 cm (76.4%), followed by the laying of the medial position with a diameter between 1 and 2 cm (52, 9%).

More research is needed on *Pterocarpus* artificial regeneration through seed, stem and vegetative propagation and coppicing etc.

3.5. Sierra Leone's CITES related regulatory framework

3.5.1 The Forestry Act, 1988

The Forestry Act, which first came into effect on 1st July 1988, mandates the Forestry Department to take steps to ensure compliance with the provisions of the Act. It mandates the Director of Forestry or his representatives to enforce the legislation. It is the primary basis for law that guides forest management in Sierra Leone. In 2008, development, exploitation and trade reforms were introduced with Cabinet approval of regulations. The reforms standardize the processes and guidelines for issuing logging permits, transport permit export permits, use of stumpage fees, benefit sharing from forest exploitation, import of chain saws and sawmills, registration of timber and wood product enterprises, and establishes a Conservation Trust Fund.

The Act stipulated that no person shall in any National Production Forest hunt or take possession of any wild animal, take any forest produce as defined in this Act, uproot, burn, strip the bark or leaves from, or otherwise damage any tree, set fire to any grass or herbage or kindle a fire without taking due precautions to prevent its spreading, permit any domestic animal to enter or trespass, do any act connected with forestry, agriculture or mining, excavate or prospect, drill or level the ground or construct or perform any work involving the alteration of the configuration of the trees, soil or the character of the vegetation, do any act likely to injure or disturb the flora or fauna, reside in or erect any building or make any camp, fish or attempt to kill fish, set any snare, net, trap or other instrument for the purpose of catching or killing animals or likely to catch, kill or injure any animals, introduce any species of fauna and flora, whether indigenous or imported, wild or domesticated, construct any dam or weir across any river or stream or otherwise obstruct the channel of any river or stream, enter, traverse or camp, dump any toxic waste, chemical or hazardous materials or substances, conduct or cause to be conducted any dredging activities etc. (Forestry Act,1988).

The Forestry Regulations of 1990 and other legal instruments that were developed and approved by Cabinet for the efficient management and utilization of timber and other forest products in Sierra Leone clearly outline the procedures for timber utilization, afforestation and reforestation management and the list of the timber species found in our forests across the country.

Forestry Development, Exploitation and Trade Reforms of 2010, standardize the processes and guidelines for leasing Forest Reserve and Community Forests, issuing logging permits, use of stumpage fees, benefit sharing from forest exploitation, transportation of forest products, urban tree management services, export permits, import of chain saws and sawmills, registration of timber and wood product enterprises.

3.5.2 The 2010 Forestry Policy

The Constitution of the Republic of Sierra Leone provides that the State shall “harness all the natural resources of the nation to promote national prosperity and an efficient, dynamic and self-reliant economy” (Section 7(1)a). This policy provides one tool by which this constitutional requirement is met. (Constitution,1991). Specific policy statements and strategies within the 2010 Policy, this policy find support in other relevant provisions of the Constitution. This includes Section 18, which permits restrictions on activities within forests “which is reasonably required in the interests of conservation of the natural resources”. This Forestry Policy also supports strategies outlined in the Framework for Effective Management of Natural Resources, found in Section 11 of the Sierra Leone Poverty Reduction Strategy II, “Agenda for Change” (PRS II 2007) and Mid-term Development Plan of 2018. Specific to forestry, the framework urges the formulation of new forest policy and legislation based on resource inventory information and the principles of Sustainable Forest Management (Section 11.4).

The management foundation as stipulated in the 2010 forest policy is rooted in the following key statements on, land use planning, forest reserve management, community forest management, private forest management, private forest land management, non-forest reserve public land, wetland management in forest reserve protected areas, wetland management outside forest reserve protected areas, timber-based enterprises, non- timber-based forest product enterprises, distribution of benefit, eco-tourism, wildlife management, watershed management, climate

change, public awareness, forest education, research, monitoring and evaluation and capacity building.

From the previous studies on CITES in the country, it was discovered that challenges faced in terms of compliance/ law enforcement to CITES regulation includes one of the most challenge encountered by law enforcement officer in the process of executing their mandate is the lack of awareness on the principles of the convention by the law enforcement officers themselves (Foray-Musa, 2016).

3.5.3 Wildlife Conservation Act 1972

The Wildlife Conservation Act of 1972 is the principal legislation guiding the management and regulation of wildlife and protected areas. Being an Act to make further and better provisions for the control of Fauna and Flora of Sierra Leone and to give effect to the "International Convention Relating to the Protection of Fauna and Flora in such Natural State-1933" as amended by the "International Convention for the Protection of Fauna and Flora of Africa of 1953." The Act stipulated that no person shall in any National Park, Reserve or Game Reserve unless otherwise authorized to do so under this Act or by Regulations hunt or take possession of any wild animal; take any forest produce as defined in the Forestry Act, Cap. I 89, uproot, burn, strip the bark or leaves from, or otherwise damage any tree; set fire to grass or herbage or kindle a fire without taking due precautions to prevent its spreading; permit any domestic animal to enter or trespass, do any act connected with forestry, agriculture or mining, excavate or prospect, drill or level the ground or construct or perform any work involving the alteration of the configuration of the soil or the character of the vegetation; do any act likely to injure or disturb the flora or fauna; reside in or erect any building or make any camp; fish or attempt to kill fish; set any snare, net, trap or other instrument for the purpose of catching or killing animals or likely to catch, kill or injure any animals; introduce any species of fauna and flora, whether indigenous or imported, wild or domesticated; construct any dam or weir across any river or stream or otherwise obstruct the channel of any river or stream; enter, traverse or camp etc. (Wildlife Conservation Act 1972)

3.5.4 Conservation and Wildlife Policy 2010

Sierra Leone's Forestry and Wildlife Sector policy has been inadequate in addressing contemporary issues in forestry governance and management. To date, the most complete

statement of policy is the draft Forestry and Wildlife Sector Policy from 2003, which was never formally adopted by the Government of Sierra Leone (GoSL). This draft policy includes a wide-range areas covering background issues and external sector policies that impact on forestry and wildlife. The main objective of the wildlife policy section was to integrate the propagation, conservation and exploitation of wild animal life and wild vegetation into the national land use policy.

The policy focuses on implementation of strategies which requires participatory engagement of a range of stakeholders. This policy seeks to clarify institutional mandates and responsibilities for the conservation of flora and fauna in their habitats and ecosystems including marine Wildlife Conservation Areas. (Wildlife Conservation policy 2010).

CHAPTER FOUR

MATERIALS AND METHODS

4.1 Research Materials

The study made use of series of materials and resources including both hard and software such as android phones, computers, printers, digital cameras, questionnaire, pen, paper and other stationery, KoboCollect software with GPS installed device, modem. Internet, projector etc. It made use of wide range of tools and methodologies to measure knowledge and understanding on CITES, its mandates.

4.2 Survey Methods

The survey design employed quantitative and qualitative methods in conducting the research with focus on the following research objectives:

- ❖ Conduct a systematic review of existing knowledge on ecology, trade volumes, threats, and legislation on *P. erinaceus* in Sierra Leone;
- ❖ Establish progress and constraints in implementing recommendations for sustainable management of *P. erinaceus* from previous studies, and from CITES; and
- ❖ Define a roadmap towards producing NDFs for *P. erinaceus* in Sierra Leone and improve compliance with CITES.

The following approaches, tools and methodologies were employed to carry out the research. These included:

- a) Carried out desk review of what has been written about the *Pterocarpus erinaceus* internationally and nationally.
- b) Conducted inception workshop to further solicit information on knowledge, capacity and information and increase further awareness.
- c) Conducted household interviews using KoboCollect software.
- d) Conducted Focus Group Discussions to gather qualitative data/information aligned to CITES implementation and triangulate them with the household questionnaire.
- e) Engaged key informants to solicit information on *Pterocarpus erinaceus* and CITES implementation in Sierra Leone.

- f) Tracked market information on quantity exported and revenue generated from 2018 to 2022.
- g) Employed Non-Participants observation method to document the spread of the species and its ecology.

4.3 Study area

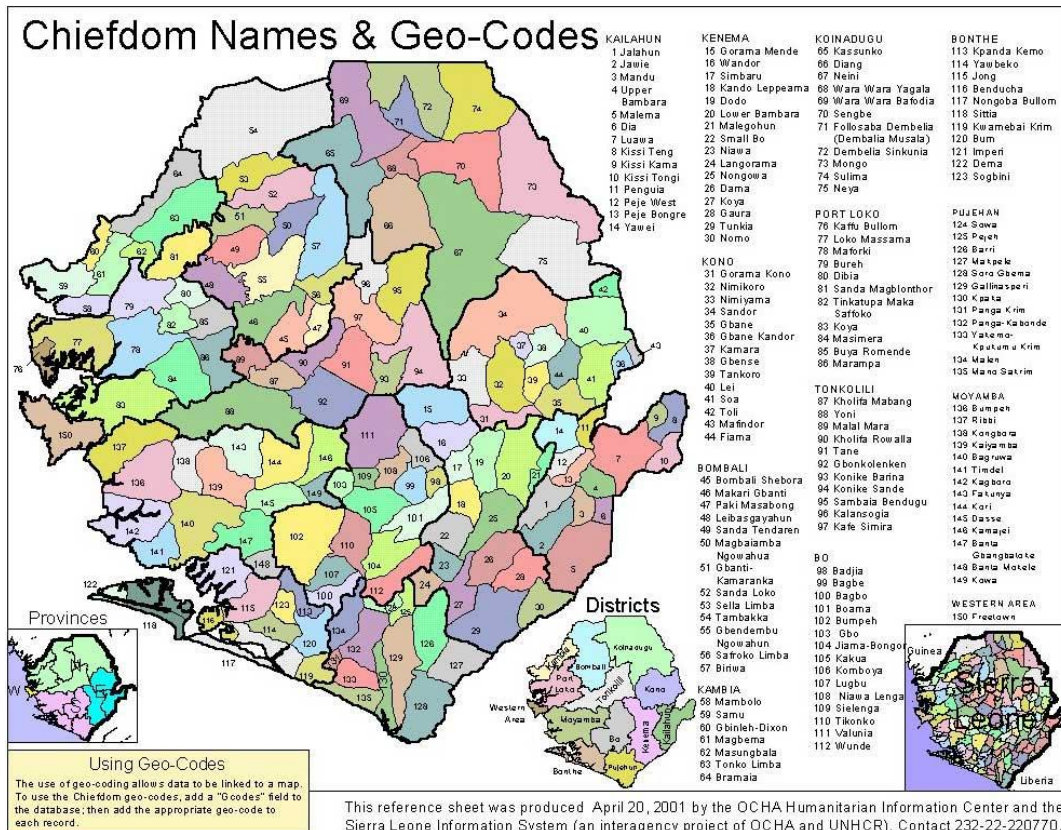


Figure 3: Chiefdom map of Sierra Leone (Source: OCHA Humanitarian Information Centre, 2001)

The study was carried out only in community forest land where *Pterocarpus erinaceus* is found and where it was recently logged before the suspension. From observation and information gathered from the communities, *Pterocarpus erinaceus* is found in almost all of the chiefdoms in the following regions and districts below (Figure 3):

- Northern East region: Falaba, Koinadugu, Bombali, and Tonkolili districts.
- Northwest region: Kambia, Karena, and Portloko district
- Eastern region Kono District

Other areas alongside the borders of these districts where the species dominate were also visited and assessed.

However due to the limited timing, not all the regions, districts, chiefdoms, communities and locations where the species is found were targeted for the research. The following were the districts where the research was conducted, and this represented 50% of the districts where it is found.

- Northern East region: Falaba and Koinadugu and Tonkolili districts.
- North-West region: Karena district

These four selected districts were the hot belt of recent and indiscriminate logging from 2018 to 2021 before the ban was slammed on the country hence the reason why they were chosen. See the below districts where data was collected for the purpose of this study.

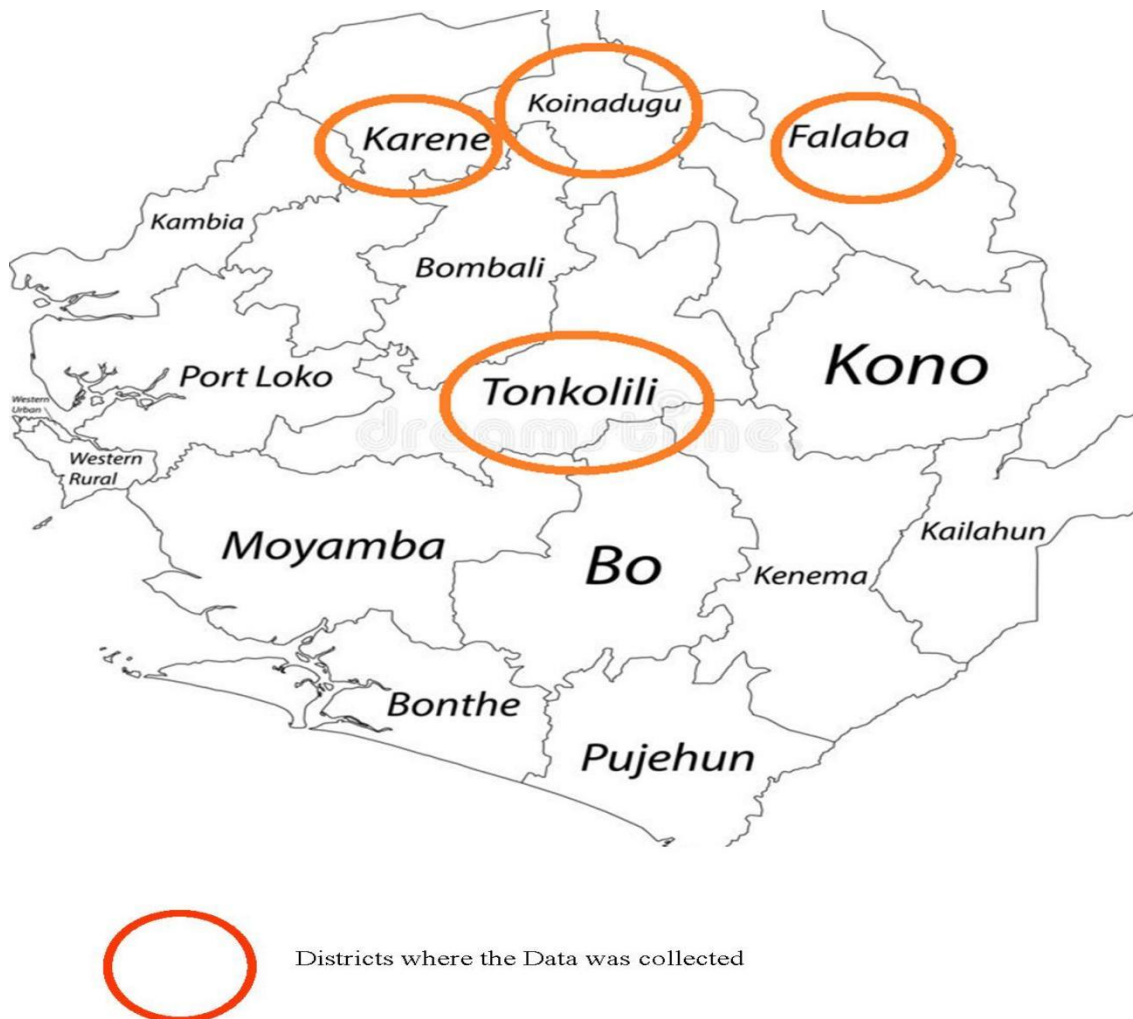


Figure 4: Map of Sierra Leone showing areas where data was collected Source: Sahr Josiah Kellie

4.4 Study design and sample size

4.4.1 Inception workshop

To track knowledge, understanding and compliance to CITES implementation on the logging and exportation of *Pterocarpus erinaceus*, the subsequent ban of range States from logging and exporting the species, the threats and challenges in implementation CITES regulations, an inception workshop was organized at the Food and Agriculture Organization's office in Freetown.



Figure 5: Photo of Inception workshop on the thesis with relevant stakeholders. Source: photo by Sahr Josiah Kellie, 2023.

The workshop attracted 20 participants from all relevant institutions with stake in CITES implementation and compliance. The workshop exposed many issues and filled critical knowledge gaps. Most of the recommendations proposed during this inception meeting including contributions, concerns, comments as well as group sessions formed the basis for the drafting of the roadmap for NDF in Sierra Leone processes for *Pterocarpus erinaceus*.

Immediately after the inception workshop, data collectors were trained to first review the draft questionnaire and adjusted training arrangement where necessary. The actual training was divided into two phases namely paper-based using hard copies of the questionnaire and software-based using KoboCollect. The training was delivered in English and Krio. The workshop was organized

at the office of the Food and Agriculture Organization of the United Nations (FAO) and funded by WABiLED through IUCN on the 13th of December 2022. A total of 20 participants from 11 institutions attended the workshop. This group represented the elites who are key informants. These institutions include Ministry of Environment and Climate Change (MOECC), Forestry Department (FD), National Protected Area Authority (NPAA), Conservation Society of Sierra Leone (CCSL), Wetland International/Sierra Leone, Food and Agriculture Organizations of the United Nations (FAO), Reptiles and Amphibian Programme Sierra Leone (RAPSL), Timba Association, Green Climate Organization Sierra Leone Limited, Society for Gender Research and Advocacy for Justice and Environment Protection Agency/Sierra Leone (EPA-SL).

After the training, Data Collectors were sent to their respective communities to collect the information for a period of two weeks.

4.4.2 Key informant Interview

For the Key Informant interview, only people with adequate knowledge in any or all of the *Pterocarpus erinaceus* intervention along the value chain. In total 41 Key informants from different entities were interviewed. Questionnaire was designed to solicit information from these Key Informants. These Key Informants were selected based upon their roles and interventions in the management, harvesting and exportation of *Pterocarpus erinaceus*.

4.4.3 Focus Group Discussions

For the Focus Group Discussions in each of the communities sampled, the research team engaged and divided the participants into three groups - namely women, youths and the elderly/chiefs. In total, 72 groups were interviewed. Questionnaire was also used to gather information from the groups engaged.



Figure 6: Photo of administering questionnaire in the study area. Source: Sahr Josiah Kellie, 2023

4.4.4 Household survey

For the household survey, systematic random sampling and constant skipping method at house and household levels as displayed below were used. A house questionnaire designed approach was used to collect the information. A total of 400 households spread across the research areas were interviewed. See below the household selection and constant skipping method employed.

For any community with:

- i. Less than 10 houses, all the houses within that community were sampled and only one household interviewed;
- ii. over 10 houses but less than 20, every 1st house was skipped but the 2nd sampled, and one household interviewed from each;
- iii. over 20 houses but less than 30, every 1st and 2nd houses were skipped but the 3rd sampled and one household interviewed from each;
- iv. over 30 houses but less than 40, every, 1st and 2nd and 3rd houses were skipped but the 4th sampled and one household interviewed from each;
- v. over 40 houses but less than 50, every, 1st, 2nd, 3rd and 4th were skipped but the 5th house was sampled and one household interviewed from each;

- vi. over 50 houses but less than 60, every, 1st, 2nd, 3rd and 4th and 5th houses were skipped but the 6th sampled and one household interviewed from each;
- vii. Over 60 houses but less than 70, every, 1st, 2nd, 3rd 4th and 5th houses were skipped but the 6th was sampled and one household interviewed from each;
- viii. over 70 houses but less than 80, every, 1st, 2nd, 3rd, 4th, 5th and 6th houses were skipped but the 7th was sampled and one household interviewed from each;
- ix. over 80 houses but less than 90, every 1st, 2nd, 3rd and 4th 5th, 6th and 7th houses were skipped but the 9th was sampled and one household interviewed from each; and
- x. 90 houses but less than 100, every 1st, 2nd, 3rd and 4th 5th, 6th and 7th, 8th and 9th houses were skipped but the 10th house was sampled and one household interviewed from each;

However, the constant slipping method was only used for house selection and not for household. For every house selected based on the criteria above, only one or three households were interviewed.

Data collection tools used quantitative and qualitative approach. Quantitative tool focused on Household Questionnaires while the qualitative targeted Focus Group Discussion and Key Informant Interviews.

The FGD process was employed to stimulate primary qualitative explanation to triangulate quantitative data in addition to elaborating on the objectives designed for quantitative questionnaire survey. The designed and verified checklists were used to support and guide the Focus Group Discussion process. The total number of participants during each FGD meeting did not exceed 15.

4.4.5 Observations

The participant observation method was used to note some information and take photos on certain indicators such as the species' location, dominance, stumpage, abandoned logs, logs converted in to charcoal, coppicing, regeneration potentials, ecology, threats and challenges.

4.4.6 Desk Review

The desk review focused on related studies on *P. erinaceus* in Sierra Leone and other countries. The research work also reviewed recommendations from previous studies on *P. erinaceus* and CITES implementation in Sierra Leone and further investigated which recommendations were implemented and those that were not implemented. It also looked at the challenges or constraints faced in implementing these recommendations and proposed actions, timeline, and responsible person(s) or entity(ies).

4.5 Study population and household sampling

From the project beneficiary population of 40,504, the sample size for the baseline survey was calculated using the sample size calculator as depicted in the link in the footnote.⁷:

The confidence level for the sample size was calculated to be 95%;

Margin of error was calculated to be 5%;

Population proportion was estimated to be 50%.

Based upon the above sample calculation, a total of 388 households were to be enumerated. To increase the confidence level, 12 households were added which increased the total households to 400.

4.6 Mapping location using GPS in the android phones.

Each Data Collector was asked to first map the community before proceeding with the interview. The coordinates marked were then used to produce the survey area map attached - figure 4. A GIS Expert who was involved in the NDF Mapping exercise with the government also shared map of the areas where *Pterocarpus erinaceus* is found which is also attached - figure - 2.

4.7 Data analysis

The data collected from the desk review, inception workshop, Key Informant Interview, Household Survey and Focus Group Discussion etc. were analyzed using KoboCollect. The data

⁷ <https://www.calculator.net/sample-size>.

were transported into MS Excel for detailed aggregation and analysis. The data were then presented in charts, tables, graph forms etc. for visual understanding and interpretation.

4.8 Limitations of the study

The initial plan for this research was to reach to all the districts where *Pterocarpus erinaceus* is found and gather as much information as possible. However, due to limited educational research timeline, financial, human and material resources, the study was limited to just four out of the eight districts. This represented 50% of the districts where the species is known to occur. Considering the number of chiefdoms in each district and the number of localities in each chiefdom, the targeted chiefdoms were also reduced to two per district. The selection of houses was based upon the selection criteria set under the methodology.

The NDF concept is a new phenomenon in Sierra Leone including other range state in West Africa. Understanding the concept by most people including the data collectors, supervisors and other literate stakeholders was new and resulted in delays.

Another challenge faced was the multiplicity of thesis's reviewers and supervisors. This led to delays as what one reviewer or supervisors may consider as relevant may be classed by the others as irrelevant.

CHAPTER FIVE

RESULTS AND DISCUSSION

5.1 Research Findings and discussions

The research findings and discussions were anchored in the following research outcomes drawn from the research objectives in chapter one. The results from the research were therefore placed under the following outcomes, including the demographic information.

1. Existing knowledge on ecology, trade volumes, threats, and legislation on *P. erinaceus* in Sierra Leone documented;
2. Progress and constraints in implementing recommendations from previous studies sustainable management of *P. erinaceus* identified; and
3. Roadmap for a successful conduct and submission of NDF drafted and validated.

5.1. Demographic information

5.1.1 Respondents' household status

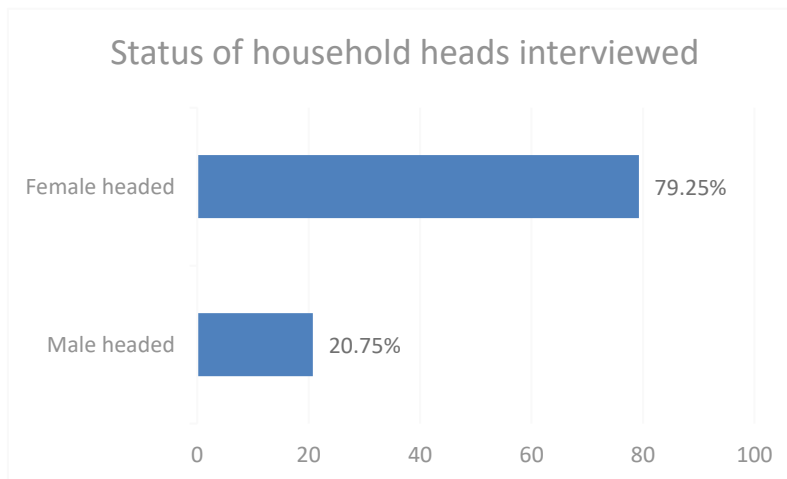


Figure 7: Status of household heads interviewed Source: Sahr Josiah Kellie, 2023

From the data collected and analyzed as portrayed in figure 7, it was revealed that 79.25% of household interviewed are headed by females while 30.75% are headed by females. With reference to sex composition of those interviewed, 61.30% were males and 38.70% were females. It could be recalled that the data collection period coincided with the busy period for women with most of them engaged in harvesting of their agricultural crops, fishing and doing other domestic duties. Thus, many were unable to spare the time to be interviewed.

5.1.2 Respondents' educational level

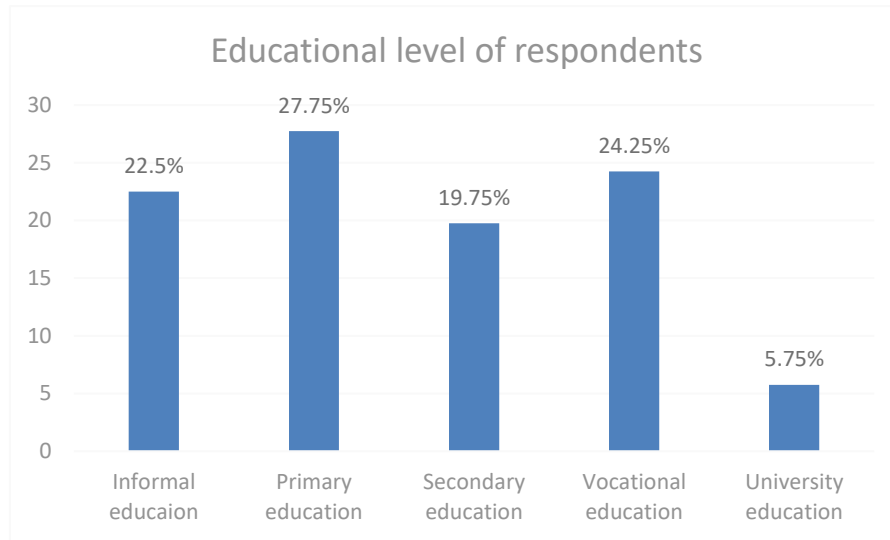


Figure 8: Respondents' educational level. Source: Sahr Josiah Kellie, 2023

With reference to the responses on the educational level of those interviewed as displayed in figure 8, 27.75% attained primary education, 24.25% had vocational education, 22.5% had informal education, 19.75% went up to secondary level and 5.75% attained university education. In a comparative categorization of formal and informal education, the findings revealed that 22.25% never went to formal education but 77.75% were privileged to darken the doors of education ranging from primary, secondary, vocational up to university levels. This confirmed that literacy level is higher in these project communities. The research also revealed a very low university educational attainment with just 5.75%.

5.1.3 Total respondents per localities

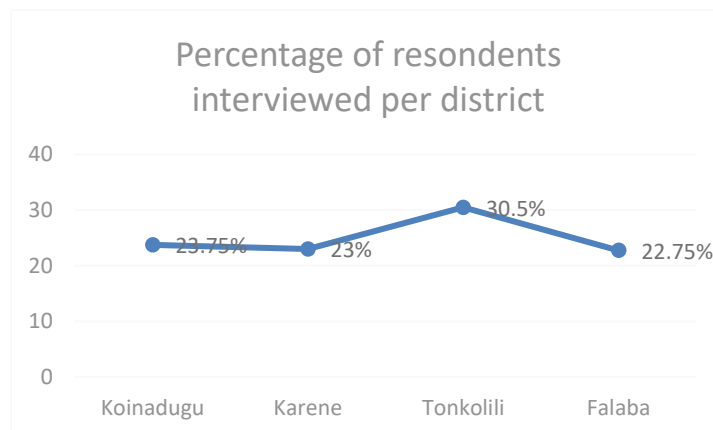


Figure 9: Percentage of respondents interviewed per district. Source: Sahr Josiah Kellie, 2023

Figure 9 displayed total percentage of respondents reached per district. The result shows that 30.5% of the respondents were interviewed in Tonkolili, 23.75% from Koinadugu, 23% were from Karene and 22.75% were interviewed in Falaba. The reason for the high percentage of those interviewed in Tonkolili district was as a result of challenges faced in the other districts in terms of accessibility. Due to limited access to remote communities, long distances between chiefdoms in the other three districts, traditional and other ceremonial rites in the other districts, the team in Tonkolili was therefore asked to fill the data collection gap.

5.2 Existing knowledge on ecology, trade volumes, threats, and legislation on *P. erinaceus* in Sierra Leone documented

5.2.1 Perception of the occurrence of *Pterocarpus erinaceus* in local communities

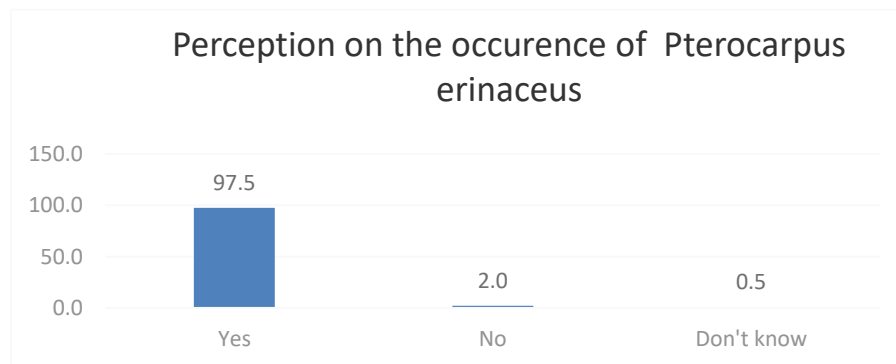


Figure 10: Perception of the occurrence of *Pterocarpus erinaceus* in local communities Source: Sahr Josiah Kellie, 2023

Figure 10 provides information about the Perception of the occurrence of *Pterocarpus erinaceus* in local communities. From the data provided, it was revealed that 97.5% of those interviewed confirmed the presence of the species within their communities while 2.0% admitted that the species is not found in their communities and 0.5% don't know if it exist in their communities. The information provided shows that majority of the people are aware about the existence of this species, have fair knowledge about it and can therefore even identify it within the landscape. This was evident by 99.8% confirmed that they know the species and had local names for it in their respective languages.

From field visit to areas where the species exists, the team did not spot a single tree standing alone but found it in patches spread over some considerable distance with the stands in close proximity to each other. This shows that the species' regeneration potential is very high. Thus, high rate of coppicing was also noticed in all the field visited. The team also noticed that the species's regeneration was impacted by wildfire. As a drought resistance species, it has adapted to the yearly bush fires and hence flourishing.

5.2.2 Community involvement in the harvesting of *Pterocarpus erinaceus*

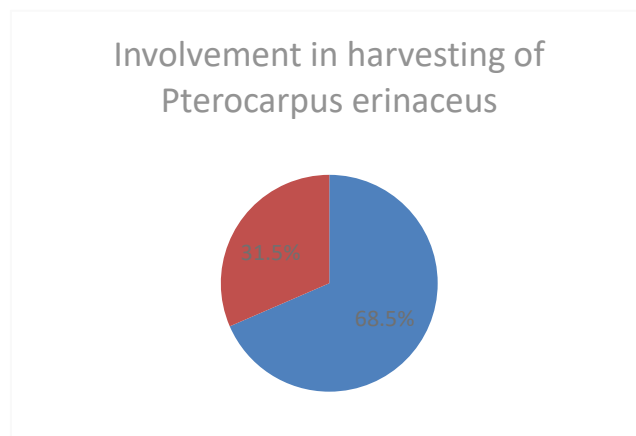


Figure 11: Involvement in the harvesting of *Pterocarpus erinaceus*. Source: Sahr Josiah Kellie, 2023

Figure 11 reveals community involvement in the harvesting of the species. It shows that 68.5% of the population were involved in the harvesting of *Pterocarpus erinaceus*. However, a considerable number of people representing 31.5% admitted that they are not involved in the harvesting of the species. This shows that not all of the people within the communities are involved in the harvesting of the species.

Further investigation into the challenges faced in harvesting the species, the respondents identified the following challenges: 35% indicated financial constraints, 25% indicated low incentives, 20% disclosed poor road network, 11% revealed fuel constraints and 9% disclosed accidents resulting from logging, hauling, loading and offloading into trucks.

5.2.3 Knowledge on increase or decrease of species population

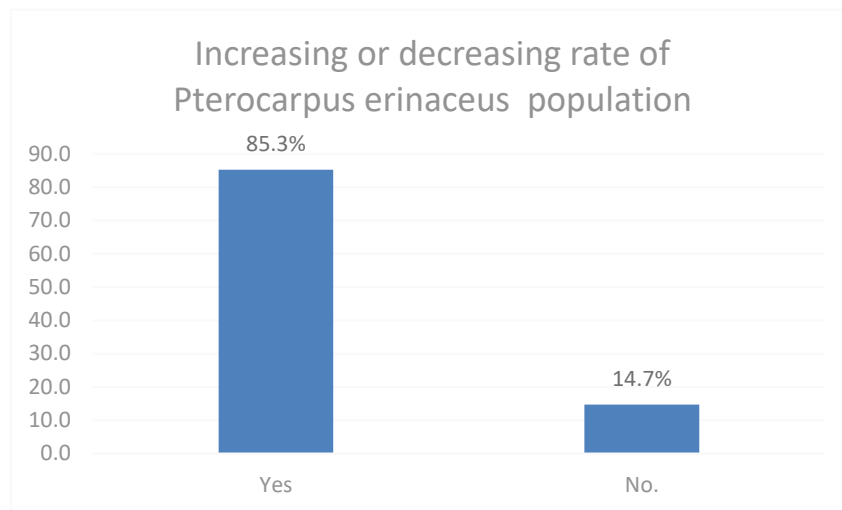


Figure 12: Rate of increase or decrease of *Pterocarpus erinaceus*. Source: Sahr Josiah Kellie, 2023

Figure 12 provides information on whether the species' population is increasing or decreasing, 85.3% revealed that it is increasing while 14.7% disclosed that it is decreasing. Irrespective of the massive logging going on, it was discovered from observation that coppicing and natural regeneration are going on even though they are affected by wildfire common in the north especially during the dry season. This wildfire posed serious cross border challenges between cattle rearers and farmers. Cattle rearers from Guinea often set fire for fresh vegetation to sprout to feed their cattle. This fire in turn destroys large track of crops every year.

5.2.4: Assessment of local communities' perceptions on the establishment of a ban on harvesting and exportation of the *Pterocarpus erinaceus*

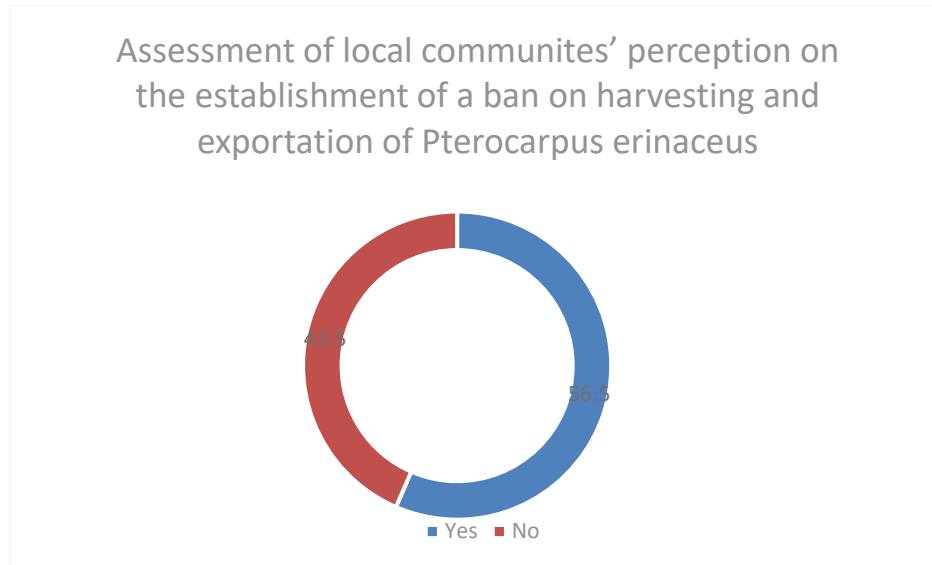


Figure 13: Assessment of local communities' perceptions on the establishment of a ban on harvesting and exportation of the *Pterocarpus erinaceus* Source: Sahr Josiah Kellie, 2023

On the question of whether the harvesting and exportation of *Pterocarpus erinaceus* should be banned as presented in Figure 13, 56.5% wanted a ban slammed on Sierra Leone not to even harvest or export while 43.5% do not want any ban. The question one would ask is, if the harvesting of the species is beneficial to the communities, why should majority of those interviewed want a ban to be placed not only on the harvesting but even on the exportation. To understand why majority opted for a ban, a follow up question on why it should be banned revealed that 30% admitted that they have not been receiving benefits as a community in the form of community development interventions or as corporate social responsibilities from the harvesters or exporter, 23% disclosed that the prices the agents normally pay for logging *Pterocarpus erinaceus* timber is very small, 22% confirmed that their roads are destroyed without any maintenance support from the loggers or exporter, 20% revealed that their forest ecosystems are destroyed without any afforestation and reforestation support, 15% noted that an increase in accidents that results from the harvesting, hauling, loading and offloading in to the small pickups, boats and ferries and trucks, 10% disclosed that few job opportunities are provided only for able-bodied youths and men. The only benefit young women gain from this trade is serving as cooks in the logging camps which in most cases have resulted in unwanted pregnancies and fatherless children.

Further investigation into who is really benefiting from the harvesting and exportation of the species, majority of those interviewed representing 85% disclosed that the exporter, the government and the timber agent are the ones who gain most.

5.2.5 Knowledge about CITES and its implementation in Sierra Leone

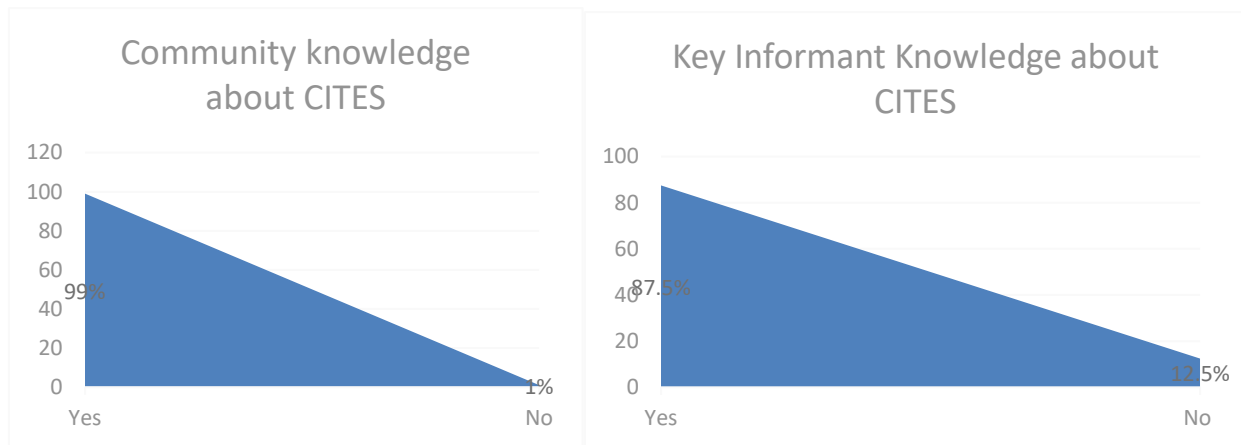


Figure 14: Knowledge about CITES implementation in Sierra Leone. Source: Sahr Josiah Kellie, 2023

With reference to community knowledge about CITES and its implementation in Sierra Leone as revealed in Figure 14, 99% of the community indicating that they are aware and knowledgeable about it. In comparison with key informants interviewed on the same question, 87.5% admitted having knowledge and are aware about CITES implementation in Sierra Leone. The results above show a dramatic increase in comparison with Kamara’s research in 2019. That research pointed out that there is low knowledge level and awareness on CITES with just 10%. The drastic increase in knowledge as revealed by the current research can be attributed to this recent effective ban by CITES. In the past, government only regulate the trade by suspending logging to remove stockpiles in the port and in the field.

Another interesting revelation about the findings above is the high increase in knowledge level and awareness about CITES by communities compared to the key informants expected to know more. It was discovered that the banning of the species from being logged and exported increased community knowledge more than the key informants since they are the ones who faced the challenges directly when logging is going on. Prices of basic food items in the communities often

increases at an alarming rate with few able to afford it. The simple fact is that the banning directly affected community people who are involved directly in *Pterocarpus erinaceus* lower-level chain of custody compared to key informants who are residing in the cities and not directly impacted by the harvesting and exportation.

5.2.6: Knowledge about international laws protecting endangered species

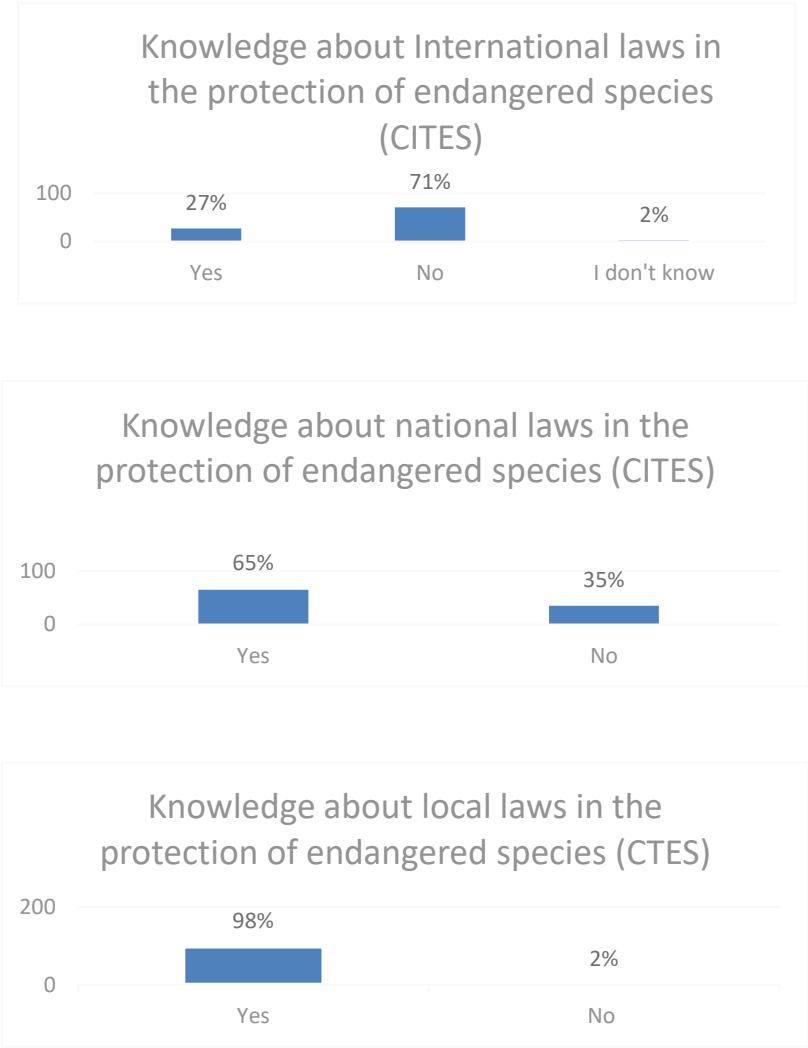


Figure 15: Knowledge about international, national and local laws in protecting endangered species Source: Sahr Josiah Kellie, 2023

The Figure 15 presents three related data about respondents' knowledge on the protection of endangered species by international, national and local laws. It revealed that 71% of those interviewed indicated that they are not aware about any international law in the country that protects endangered species on CITES' list, 27% admitted that they are aware while 2% said they don't know.

With reference to respondents' knowledge on national laws that should protect endangered species, 65% indicated that they are aware and knowledgeable about these national laws while 35% admitted that they don't know. However, when asked to identify any of the international and national laws, only 30% were able to identify two national laws (Forestry and Wildlife Acts), 70% identified one international law (CITES). Many admitted that they do not know how species are listed and which species is on CITES's list in Sierra Leone. They revealed that they have never seen the endangered listed species on CITES' list.

With regards to local laws commonly known here as bylaws, 98% of those interviewed indicated that they are aware about bylaws in the protection of endangered species and 2% revealed that they are not aware. On the question of why bylaws are effective, many disclosed that these laws are developed and validated by them, they therefore value, obey and respect them more than the national and international laws.

5.2.7 Responses on the effectiveness of these three laws

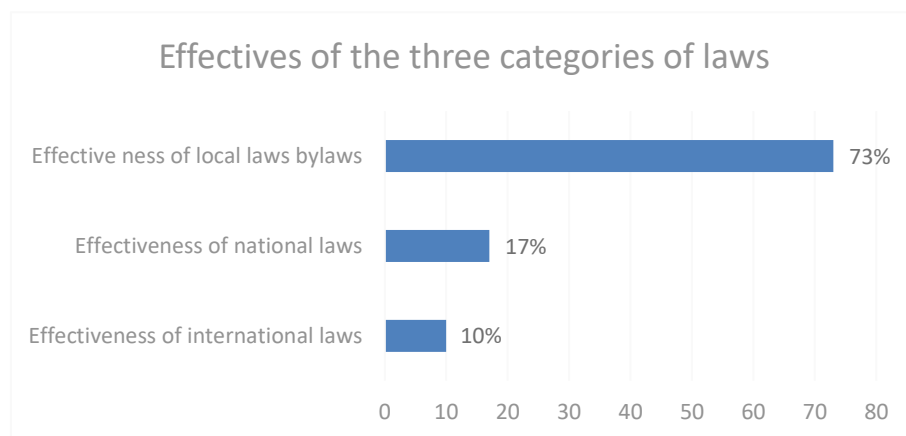


Figure 16: Effectiveness of the three categories of laws. Source: Sahr Josiah Kellie

Figure 16 presents information on the effectiveness of each category of laws (International, National and local laws - bylaws). Majority of those interviewed representing 73% admitted that bylaws are more effective since the communities are directly involved in the drafting including all the other processes involved, 17% opted for national laws to be more effective while 10% agreed that international laws are more effective in protecting endangered species. It should be noted that CITES like any other international conventions are only enforceable through national entities.

5.2.8 Knowledge about the entities charged with conservation of endangered species

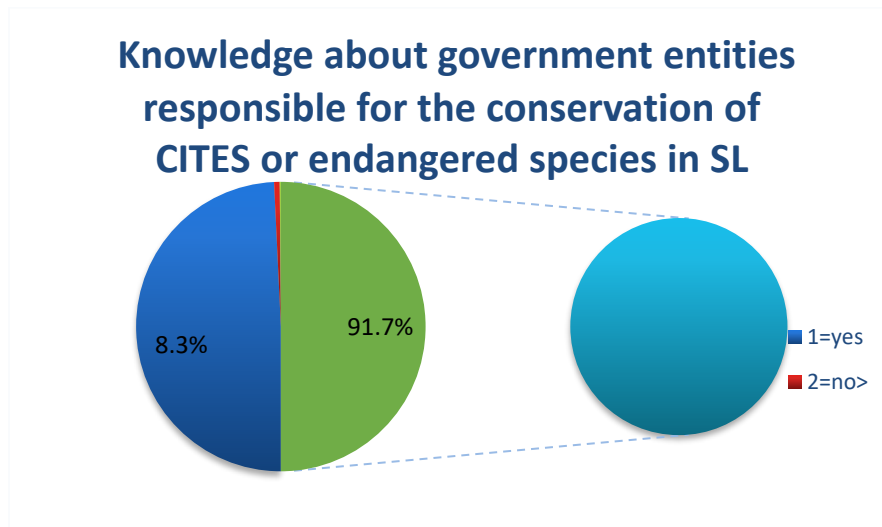


Figure 17: Knowledge about the government entities responsible for the protection of endangered species on CITES’s list. Source: Sahr Josiah Kellie, 2023

Figure 17 provided information on knowledge about entities responsible for the protection of endangered species on CITES’s list. When asked if they are aware about the entities that are responsible for protecting endangered species, 92% said that they know the entities and even went to the extent of naming the entities such as Forestry Division, and National Protected Area Authority. About 88% identified these two entities. However, 8% don’t know the entities in the country charged with this responsibility.

5.2.9 Estimated data on number of trees of *Pterocarpus erinaceus* logged in family land since the start of the trade in 2018

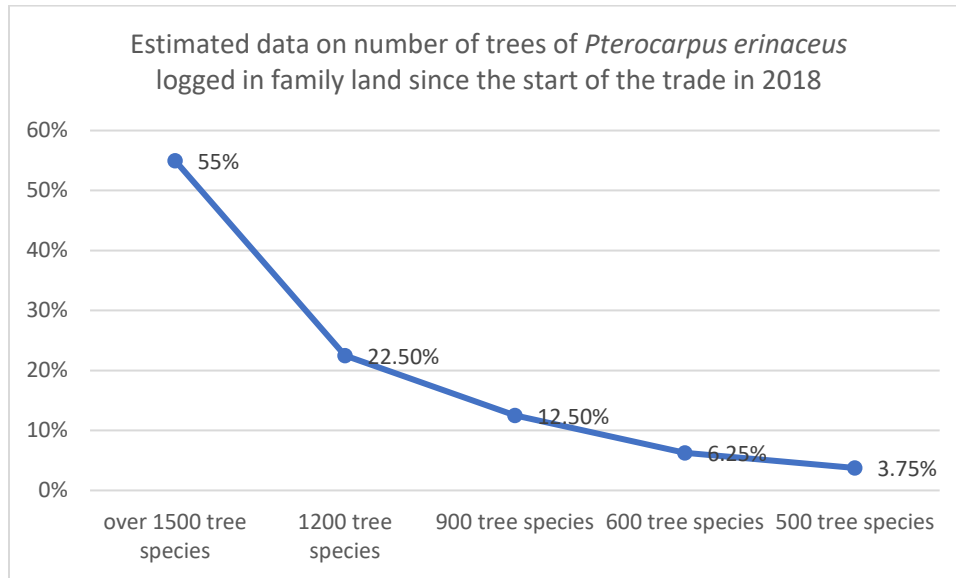


Figure 18: Estimated data on number of trees of *Pterocarpus erinaceus* logged in family land since the start of the trade in 2007 as reported by respondents Source: Sahr Josiah Kellie, 2023

Due to challenges faced in accessing export data from Sierra Leone, respondents were asked to provide information about the number of trees that were logged in their respective family land since the start of the trade in 2007. Figure 18 provides data on number of trees logged in family land since the start of the trade as reported by the 400 respondents.

According to information provided by the respondents, 55% of the respondents revealed that over 1500 trees of this species were logged in their family land, 22.5% admitted that 1200 trees were logged, 12.5% disclosed that 900 trees have been logged, 6.25% confirmed that 600 trees were logged, while 3.75% revealed that 500 trees have been logged since the start of the trade.

Further analysis and calculation of the total number of trees cut down in the various family land since the start of the trade as disclosed by 55% of the 400 respondents was estimated to be over 330,000 trees that have been cut down. This is really alarming considering the number of households involved in this trade in the 8 districts where the species is found.

When asked to identify five key benefits the country stands to gain if it comply with CITES' requirements, the respondents revealed the following:

- a) Issuance of compliance certificate;
- b) Increase the density of the species;
- c) Lead to sustainable management of the species;
- d) Access international opportunities;
- e) Help move the country from category 3 to 1 on CITES' listing;

5.2.10 Estimated trade data for 2018, to 2022 from importing country - China

Sierra Leone as a country has never published export quotas for *P. erinaceus*. Trade from 2018 predominantly consisted of 203 148 m3 of sawn timber and 2 877 500 kg of logs imported by China. Sierra Leone reported 3906 m3 of sawn wood exported to China. According to Chinese customs data from the Global Trade Atlas, rosewood logs imported by China from Sierra Leone over the period 2009-2018 totalled 403 463 m3.⁸

Thus, the data provided in the table below is the current data presented on behalf of the country by the exporting agent.

Table1: Trade volume from 2018 to 2022 data from the exporting agent in Sierra Leone. Source: Sahr Josiah Kellie, 2023

No	Year	m3
1	2018	91,673.4
2	2019	288,190
3	2020	297,239.6
4	2021	286,881.2
5	2022	113,643.6
Total		1,077,627.8

⁸ <https://cites.org/sites/default/files/eng/com/pc/25/Documents/E-PC25-15-05.pdf>

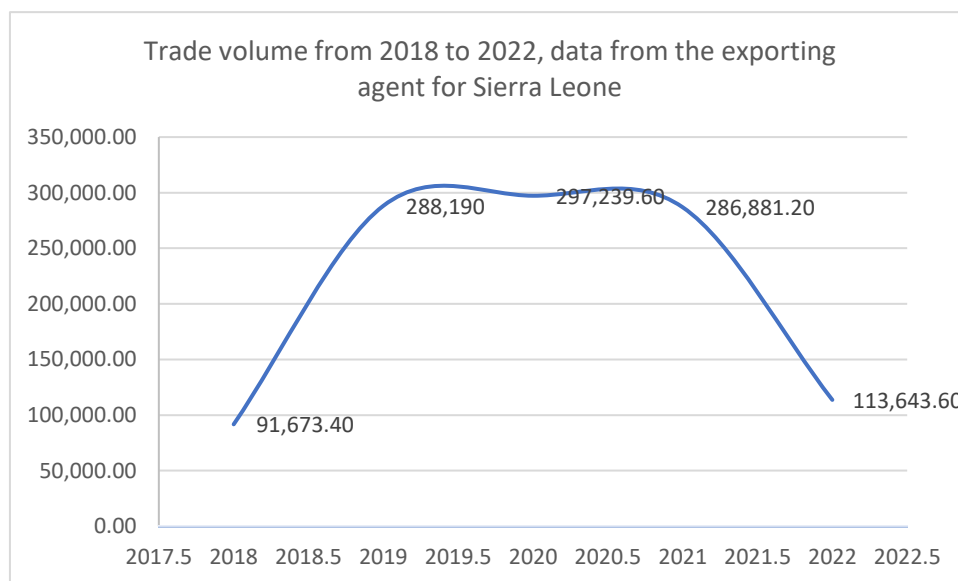


Figure 19: Trade volume data from 2018 to 2022, by the exporting agent for Sierra Leone. Source: Sahr Josiah Kellie, 2023

Figure 19 provides data on the export of *P. erinaceus* from Sierra Leone as provided by the only export agent. The quantities exported in the following years is shown below:

- a. 91,673.40 m³, was exported in 2018
- b. 288,190 m³, was exported in 2019
- c. 297,239,60, was exported in 2020
- d. 286,881.20, was exported in 2021
- e. 113,643.60, was exported in 2022

The data shows a slow start in trade in 2018 but increased rapidly in 2020 and maintained a peak in 2021. However due to the suspension in 2022, a drastic drop of 113,643.60 was recorded.

After consulting the CITES Trade Database, the results are shown in Tables 2 and 3.

Table 2: *P. erinaceus* export from Sierra Leone to China, period 2018-2021 (source [CITES Trade Database 2022](#))

Year	App.	Taxon	Importer	Exporter	Importer reported quantity	Term	Unit	Purpose	Source
2018	II	<i>P. erinaceus</i>	CN	SL	3,007,972.32	logs	m ³	T	W

Year	App.	Taxon	Importer	Exporter	Importer reported quantity	Term	Unit	Purpose	Source
2019	II	<i>P. erinaceus</i>	CN	SL	169791.269	logs	m3	T	W
2020	II	<i>P. erinaceus</i>	CN	SL	159803.71	logs	m3	T	W
2021	II	<i>P. erinaceus</i>	CN	SL	154,801.3	logs	m3	T	W

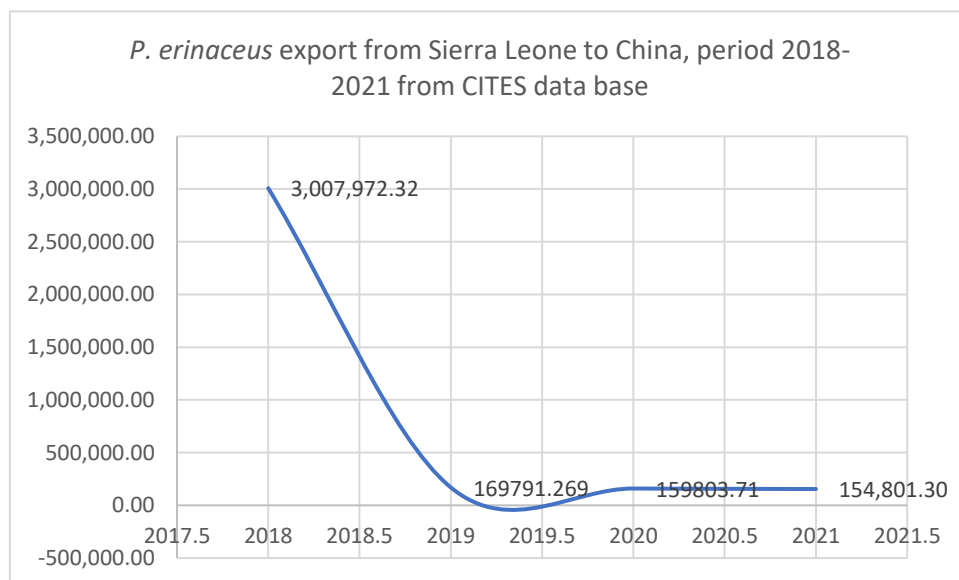


Figure 20: *P. erinaceus* export from Sierra Leone to China, period 2018-2021 Source: CITES database

Figure 20 shows trade volume as found in the CITES database as follows:

- a. 3,007,972.32 m³, was exported in 2018
- b. 169, 791.269 m³, was exported in 2019
- c. 159,803.71 m³, was exported in 2020
- d. 154,801.30 m³, was exported in 2021

The data shows a large volume (3,007,972.32 m³) in trade as was recorded from the CITES' trade database in 2018. In 2019, the trade volume dropped to 169791.269 m³ and maintained this drop in 2020 with 159,803.71 m³ and in 2021 with 154,801.30 m³.

The species export data in 2018 was low but increased rapidly in 2020 and maintained this peak in 2021. However due to the suspension in 2022, a drastic drop of 113,643.60 was recorded. In comparing the two tables and graphs above, huge discrepancies were noticed from the data provided by the country’s exporting agent and those found in the CITES database. For example, in 2018 91,673.40 m³ was reported to have been exported based on information provided by the country’s exporting agent as against 3,007,972.32 m³ that was reported by the import country as was found in the CITES database. Similar discrepancies were noticed in the following years: 288,190 m³ was reported in 2019 by the country’s export agent in comparison to 169, 791.269 m³ received by the importing country as discovered in the CITES database.

From the above, it came out clear that the exporting country is not doing effective reporting on the trade volume.

5.3: Establish progress and constraints in implementing recommendations for sustainable management of *P. erinaceus* from previous studies and from CITES

5.3.1: Threats facing *Pterocarpus erinaceus* in Sierra Leone

Table 3: Threats facing *Pterocarpus erinaceus* in Sierra Leone. Source: Sahr Josiah Kellie, 2023

Ranking of key threats identified				
Wildfire	Unsustainable logging for export	Unsustainable Non-Timber Forest Product (NTFP) harvesting	Unsustainable logging for furniture/building materials and fuel wood/charcoal	Unsustainable farming
36%	31%	4%	7%	22%

Table 3 provides data on the threats facing the species in the wild. Wildfire topped the list as the most alarming threat with 36%, followed by unsustainable logging for export with 31%, unsustainable farming with 22%, unsustainable logging for furniture, building materials, fuelwood and charcoal with 7% and NTFP harvesting with 4%. From the results provided as displayed above, it shows that the species is faced with serious human-induced threats which has over the

years affected the species rapid natural regeneration. These threats affect the standing tree, those coppicing and the seeds.

5.3.2 Barriers impeding CITES implementation in Sierra Leone

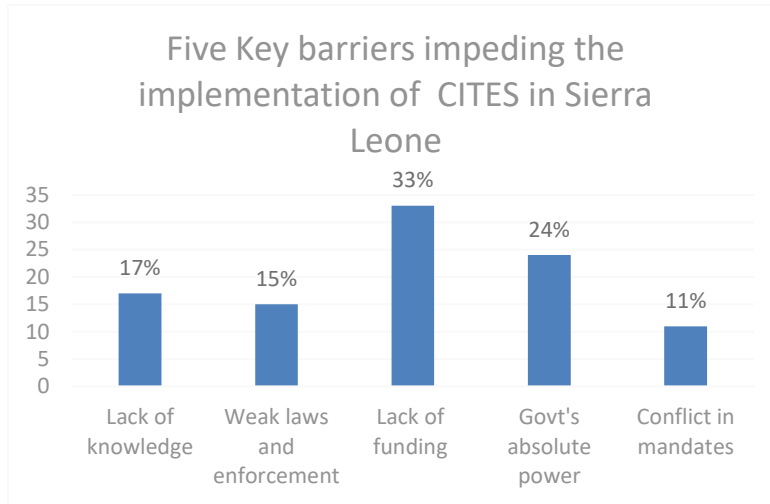


Figure 21: Five key barriers impeding CITES implementation in Sierra Leone. Source: Sahr Josiah Kellie, 2023

With reference to the data solicited as displayed in Figure 21 on barriers affecting the implementation of CITES regulations and meeting the requirements, 33% of the respondents identified lack of funding as the major blow, followed by government absolute power dynamics and control of the trade with 24%, lack of knowledge with 17%, weak laws and weak law enforcement with 15% and conflicts in mandates with 11%. A critical review of the above barriers indicated that weak law enforcement, government absolute power control and conflict in mandates are directly the responsibilities of the government and these three accounts for 50%. The remaining 50% which relates to lack of knowledge and lack of funding could be the responsibilities of both the government and CITES Authorities.

5.3.3 Constraints faced in implementing recommendations from previous studies

The research investigated actions taken to implement recommendations from previous studies on *Pterocarpus erinaceus* at country level. Apart from literature review of previous research works done and the recommendations that were proposed, the inception workshop revealed series of these

recommendations, their current status and challenges that are still faced by entities and the government in implementing or not able to implement the recommendations.

These recommendations and actions or steps taken so far to address them are presented in Table 4 below. The Table also included list of the recommendations, progress made in addressing them and constraints faced in implementing the recommendations. It went further to explore and proposed further actions that should be taken, timeline and entity that should lead on it.

Table 4: Progress made, and constraints faced in implementing recommendations from previous studies and proposed actions

No	Recommendations and source	Current implementation status of the recommendation	Challenges or constraints faced in implementing the recommendation	Proposed actions, timeline and responsible person(s) or entity(ies)
1	Create awareness on CITES implementation using a well-structured awareness-raising programme and biodiversity communication strategy (engagement of community stakeholders, focus group discussions, radio discussion, (Foray-Musa, 2016)	There are several awareness-raising programs that are geared towards forest management including Forestry Department, NPAA and the environment hour, EPA environment hour, and Tacugama monthly media engagement that sensitizes and raises public awareness about wildlife management and CITES-related issues. However, there is no proper communication strategy for awareness raising on CITES.	Low level of publications on the research findings/recommendations. National CITES Authorities not fully acknowledging and adopting the recommendations of the research findings due to inadequate policy backing. Low level of institutional coordination and collaboration on CITES implementation.	Organize a stakeholder consultative meeting/workshop to develop a communication strategy with key messages for CITES awareness raising and identify channels of communication. Establish partnerships with media houses for continuous engagement through radio and TV discussions.
2	Build and strengthen the capacity of CITES' Authorities (MA, SA and EA), District Forestry Officers, Custom Officers, Law Officers, Park Rangers and implementing partners (Foray-Musa, 2016 and Kamara, 2019)	Several training sessions have been organized for key stakeholders including the MRU Forest Ranger training, Border Security Team, Game Guards, and an upcoming law enforcement training for law enforcement personnel, magistrates, and judges on Wildlife management and CITES.	Limited cooperation from related Agencies. Inadequate resources to expand the scope of the capacity-building initiative. Inadequate monitoring equipment to detect smuggling of wildlife specimens. Low level of knowledge of protected species by Enforcement Agencies. No available funds to the SA for research and the development of NDFs.	Identify the capacity needs of each Authority (MA, SA, Law Enforcement Authorities, and other conservation-related stakeholders. Develop training curriculum for related Agencies and conduct regular training. Strengthen capacity (financial & equipment) for monitoring and compliance with CITES provisions.

No	Recommendations and source	Current implementation status of the recommendation	Challenges or constraints faced in implementing the recommendation	Proposed actions, timeline and responsible person(s) or entity(ies)
3	Formalization of regional networks to combat wildlife trafficking and exchange best practices (Foray-Musa, 2016)	The USAID WABiCC/WABiLED Projects have supported over three cohorts of regional experts that form a network for knowledge exchange and sharing best practices in combatting wildlife crimes. The formation of the ECOWAS Strategy for combating wildlife trafficking is also an opportunity to address wildlife crimes if adopted at the national level.	Language barrier with Francophone Colleagues. Inadequate coordination meetings. No formal Network was established. Limited funding to gather and coordinate expert working groups/species working groups.	WABiLED through MRU and ECOWAS to support the formalization of a regional expert network to formulate actions to address wildlife crimes and work towards the adoption of the ECOWAS Wildlife Strategy. Solicit funds to support the operationalization of expert working groups.
4	Enact appropriate policies and regulations in line with CITES implementation (Foray-Musa, 2016 and Kamara, 2019)	The International Security Advisory Team (ISAT) partially supported the drafting of a CITES law which was incomplete due to inadequate funding for stakeholder consultative meetings and further engagement with relevant stakeholders.	There was inadequate funding to complete the process. There was limited policy directive and a low level of collaboration by related Agencies. •	The MoEnv is to provide policy guidance in the development of a CITES policy/regulation to domesticate the convention at the national level with the involvement of all related stakeholders.
5	Review of existing wildlife Acts and legislation to incorporate CITES' provisions (Foray-Musa, 2016 and Kamara, 2019)	The Wildlife Conservation Act and the Forestry Act were partially reviewed to effect administrative and policy change. However, there is an ongoing discussion to have a holistic review of the Acts which might incorporate the provisions of CITES with the availability of funds.	An inadequate legal framework to domesticate the CITES Convention and incorporate its provisions in national law for sustainable trade. Lack of funding to initiate the technical review process.	The MoEnv to approach Donor Partners including WABiLED for financial and technical support. Organize a technical consultative meeting with conservation-related Institutions, including CSOs for input into the review process.

No	Recommendations and source	Current implementation status of the recommendation	Challenges or constraints faced in implementing the recommendation	Proposed actions, timeline and responsible person(s) or entity(ies)
6	Conduct research and carry out an inventory of species in trade to provide enough scientific evidence in making NDF (Foray-Musa, 2016)	There is an ongoing assessment/inventory of <i>Pterocarpus erinaceus</i> which is the most traded CITES-listed species for the development of an NDF due to the CITES suspension.	No funding budget line for the SA in conducting NDFs.	The SA with support should work with related partners to conduct continuous scientific research on the most traded species to produce NDFs. The SA and MA should leverage and utilize existing national CITES expertise in the development of the NDF.
7	Strengthen legislations by engaging with CITES' Secretariat on actions the country is taking towards CITES' readiness, (Kamara, 2019)	Nothing has been done to address this recommendation	Lack of funding	Government should source funding from government fund, CITES and other donors. But in the absence of funding community bylaws can be done
8	Mobilize revenue for legislative drafting, adopt CITES' listing and model law framework in compliance with regional and international agreements to be embedded in CITES law drafting, (Kamara, 2019)	This process started by NPAA with support from ISAT in 2020-2021	Lack of funding	Government should source funding
9	Enhance law enforcement by developing tools and expertise for border and port enforcement, strengthen wildlife crime enforcement unit and explore possibilities for prosecution powers (Kamara, 2019)	Nothing has been done on this	Lack of funding	Government to source funding

No	Recommendations and source	Current implementation status of the recommendation	Challenges or constraints faced in implementing the recommendation	Proposed actions, timeline and responsible person(s) or entity(ies)
10	Intensify effective coordination by developing institutional coordination strategy, create platform for reporting wildlife crimes, promote the use of bylaws and support communities with species specific tailored alternative livelihoods to minimize over exploitation (Kamara, 2019)	A regional wildlife training for West Africa was conducted in Liberia by PAPBio in 2022 to form a Regional Wildlife Taskforce group in support of CITES management. It has proposed and planned to meet the CITES MA of Sierra Leone to establish a national Task force.	Lack of funding and a leading entity to lead coordination and networking	CITES to organize a conference for coordination and networking

5.4 Roadmap for NDF for *Pterocarpus erinaceus*

5.4.1 Define a roadmap towards producing NDFs for *P. erinaceus* in Sierra Leone and improve compliance with CITES.

The research investigated concrete actions in the form of roadmap that could be useful in the drafting of NDF for *Pterocarpus erinaceus*.

The inception workshop and key informant interview provided useful roadmap for this intervention as presented in Table 5 below:

Table 5: Roadmap for the conduct of a NDF for sustainable management of *Pterocarpus erinaceus* in Sierra Leone

No	Intervention or actions required	Expected outcome	Proposed timeline (start and end date)	Proposed source of funding (GoSL, private, CITES, IUCN)	Person or entity to lead the action
1	Review and take into consideration a number of concepts and non-binding guiding principles to determine whether trade would or would not be detrimental to the survival of a species.	Concrete decision will be taken to advance the NDF processes and procedures.	May 2023	GoSL	SA
2	Consult relevant stakeholders and community members including those negatively affected by the logging on the rationale for an NDF	Stakeholders including those affected and those involved in the logging and trade are clearly consulted to understand the rationale, processes and procedures in undertaking NDF leading to appropriate precautionary sustainable management approach	September, 2023	GoSL	MA
3	Seek guidance, directives and training from CITES on how to proceed with an NDF	NDF processes and procedures will be understood and capacity strengthened leading to the preparation of an acceptable NDF	October, 2023	CITES-IUCN and GoSL	MA

No	Intervention or actions required	Expected outcome	Proposed timeline (start and end date)	Proposed source of funding (GoSL, private, CITES, IUCN)	Person or entity to lead the action
4	Conduct research and review literature on species biology, life history, distribution, population trends, trade volume and conduct threats and ecological risks assessment of the species to determine if logging and exportation is not detrimental to its survival	NDF processes and procedures will be informed and supported with relevant published literature and research data.	2023 and onwards	CITES-IUCN and GoSL	SA in collaboration with other research institutions including Njala University
5	Conduct a country-wide inventory of the species to determine the geographical location, spread, population including girth, height and regeneration potential in the wild using flexible methodology that will allow for consideration of the specific and individual characteristics of different taxa of <i>Pterocarpus erinaceus</i>	Accurate data on species population, location, characteristics and regeneration potential will be available.	May 2023 to April 2024	GoSL and donor partners	SA

No	Intervention or actions required	Expected outcome	Proposed timeline (start and end date)	Proposed source of funding (GoSL, private, CITES, IUCN)	Person or entity to lead the action
6	Confirm specimen identification to verify that the specimens belong to Pterocarpus or rosewood family by consulting the nomenclature specialist of the Plants Committee in order to verify the identification of the species through this link: https://cites.org/esp/com/pc/member.php	Species identified, verified and confirmed by the Plant Committee.	June 2023	GoSL	SA
7	Check the species' range at local, national, sub-national, regional, and global levels	Information on the range of the species at all levels revealed, verified and confirmed	July 2023	CITES and GoSL	SA
8	Find out whether the chain of custody is in place including the chain of custody certification body and the methodology used to establish traceability, data source, quality, and timeliness.	Strengthen the source and traceability of the source of origin including custody certification, from point of harvest to the market.	August 2023	GoSL	MA

No	Intervention or actions required	Expected outcome	Proposed timeline (start and end date)	Proposed source of funding (GoSL, private, CITES, IUCN)	Person or entity to lead the action
9	Depending upon previous research works and other assessment, the SA may complete steps 1 to 9 or complete steps 1 to 4 and jump straight to 9 without doing 4, 5, 6, 7 and 8. See figure 4 in the NDF process.	NDF processes and procedures expedited.	November 2023	GoSL	SA
10	Finalize, submit and disseminate the findings of the accepted report	A recommendation by SA to the MA justifies that international trade in the species is detrimental or not detrimental to the species 'survival within the ecosystem.	February 2023	GoSL	SA

5.4.2 Five key recommendations for the sustainable harvesting of *P. erinaceus*

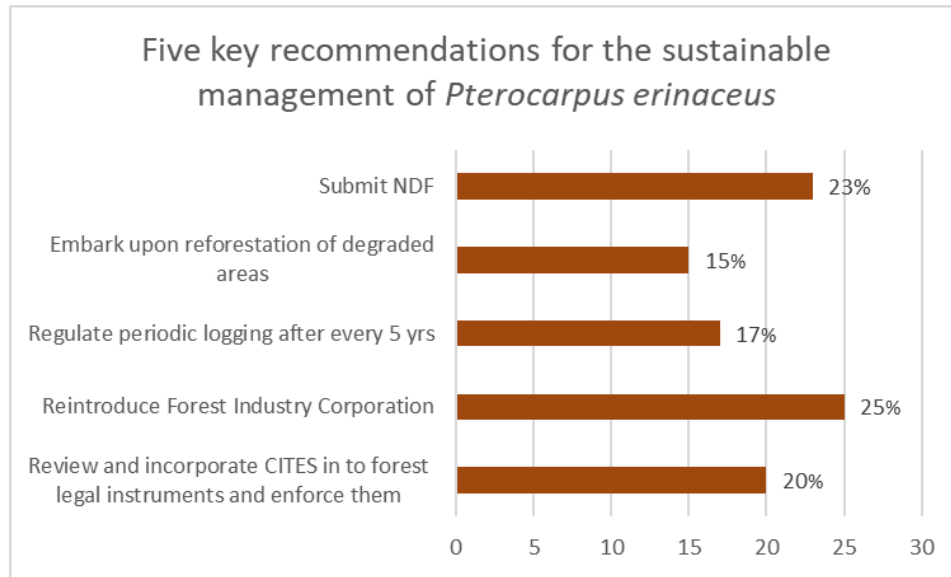


Figure 18: Five key recommendations for the sustainable harvesting of *P. erinaceus*. Source: Sahr Josiah Kellie, 2023

Figure 18 provides information on five key recommendations proposed by the respondents which if adhered to will lead to the sustainable management of the species and other endangered species on CITES' list as well. It revealed that 25% recommended that the government should re-introduce Forest Industry Corporation to manage the logging and exportation of *P. erinaceus* and other export tree species, 23% recommended the submission of NDF, 20% proposed that all forestry laws be reviewed and CITES be incorporated into those legal instruments, 17% recommended periodic logging after every five years while 15% proposed reforestation of degraded areas. It should be noted that during the colonial era and shortly after, the Forest Industry Corporation in Kenema and Panguma was responsible for all logging and exportation from the concession areas. It employed thousands of Sierra Leoneans at that time but was dismantled and services terminated by the second post-colonial government.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

This chapter gives a summary of the findings and went further to advance recommendations for current and future actions by the SA, MA, and other entities.

6.1 Conclusions

Based upon the research findings and literature works reviewed, it was noted that for *Pterocarpus erinaceus* in Sierra Leone:

1. The species is indeed harvested without reference to size, height etc. No baseline research work was ever done to ascertain the nature of the species in the wild including the geographical spread, biological constituents, threats, local uses, local and national legal frameworks to guide the management of species on CITES' list before granting logging license and export permit.
- 2.- The roadmap shows the above component as missing links for a Non-Detriment Finding for *Pterocarpus erinaceus*. No comprehensive research works have ever been conducted in this country on this species to show the species spread, local use, threats, facing it and propagation efforts applied.
- 3.- The species exists in all the communities where data was collected as revealed by those interviewed. It also revealed that a good number of the people were involved in the harvesting.
- 4.- Due to the small income the people who have lived close this species for decades some opted for a total ban as the trade seems to benefit the exporters, the loggers and their agents more than the communities. The reasons they advanced for requesting for this ban included the following: very low prices paid for the tree and not the logs, complete absence of any development undertakings, no corporate social responsibilities, damage to roads, bridges, increase in accidents and other social issues.
- 5.- The people's knowledge about CITES was probed further. The majority interviewed and even those engaged during the Focus Group Discussions admitted that they are aware

about CITES. Prior to the ban, very little was known about CITES. When the ban came to effect, many people were blaming the government to have done so until later when the loggers who went to transport the harvested logs revealed to the communities that it was CITES who imposed the ban and not the government. The ban therefore paved the way for people to know that there is a Convention on endangered species regulating their trade. Though some requested for a ban, there are those directly benefiting greatly who are against the ban.

6. To understand the defectiveness of the three categories of laws (local-bylaws, national and international), it came out clear that bylaws are well known and more effective in administering justice than national and international laws. Since bylaws are drafted, validated and endorsed by the people, the majority tends to know more about it than national and international laws that are drafted without local communities' direct involvement. As a result many will know more about local laws especially when they were involved in its drafting and had representatives who often endorse them compared to national and international laws. Majority of the respondents have knowledge about the entity responsible for regulating CITES.

7.- It was possible to have a vivid picture of the number of trees logged in the family lands of those interviewed, further analysis and calculation of the total number of trees cut down in the various family land since the start of the trade as disclosed by the 400 respondents was estimated to be over 330,000 *Pterocarpus erinaceus* trees. This is really alarming considering the number of households involved in this trade in the 8 districts where the species is found.

8.- Due to this massive logging without considering the girth of the species, the research discovered that majority of the species remaining now are below 10 cm DBH. However, the research observed high rate of coppicing of the stumps. The climatic condition, in the region where the species is found, supports coppicing, spread and propagation of the seeds since the species flowers during the dry season under north-easterly wind which favours the seeds' spread. The light weight of the seeds make it easier to spread to other areas nearby through wind erosion which help in regeneration.

9.- Huge discrepancies were noticed for exports and imports from the data provided by the country export agent and those found in the CITES database. For example, in 2018

91,673.40 m³ was reported to have been exported based on information provided by the country's exporting agent as against 3,007,972.32 m³ that was report by China, the import country, as was found in the CITES database. Similar discrepancies were noticed in the following years.

10.- Considering barriers facing the species, it was noted lack of funding was identified as the major one. Others mentioned include government absolute power dynamics and control of the trade, lack of knowledge, inadequate laws and weak law enforcement and conflicts in mandates. To strengthen governance and sustainable management of *Pterocarpus erinaceus* and other species on CITES' list, the need to go back to history was proposed where the government will once again engage Forestry Industry Corporation (FIC) that operated in Sierra Leone during the colonial era until 1991 when the war broke out. Another proposal advanced was afforestation and reforestation drive, periodic logging, incorporate CITES' laws into our legal forestry and wildlife regulations, policies, acts etc. And total review and enforcement of the legal instruments related to forestry and wildlife.

11.- A critical review of the various steps to follow in drafting NDF, the research disclosed the following:

- a). With reference to step 1 - Specimen identification - there is only *Pterocarpus erinaceus* species in Sierra Leone. This was confirmed by all the local people that were interviewed, the key informants and the focus groups;
- b. For step 2, there is no way Sierra Leone can grant permit for the export of natural or artificially propagated specimen;
- c. With reference to step 3 - Review of conservation concerns and previous government policy regulations. By critical look at the dominance of the species, the research huge presence and prevalence of this species in large stock in all the chiefdoms in each of the 8 districts where it occurs which implies that it is not on the verge of extinction but only threatened which can be controlled and regulated under sustainable management;
- d. considering steps 4 to 8 targeting management of natural regeneration, cultivation in new areas, harvesting and exportation, it was noted that rigorous and stringent measures can put in place to monitor natural regeneration, artificial propagation, harvesting and exportation; although at the moment no measure have

been put in place by the government to nurse this species.

6.2 Recommendations

Based upon Articles III and IV of the Convention, provision for granting export permits for specimens classed under Appendices I and II will only be granted provided the designated SA of the State of export advises that export of the species in question will not be detrimental to the survival of the species. This therefore requires the SA to monitor exports of specimens of Appendix-II species and, whenever necessary, to advise the MA of suitable measures that should be taken to regulate, control and limit such exports in order to sustainably maintain the species throughout its range at a level consistent with their role in the ecosystems and well above the level at which they would qualify for Appendix I.

To achieve the above, the following guiding concepts and non-binding principles need to be considered by the SA when making NDF as enshrined in AC31 Doc. 14.1/PC25 Doc. 17 – p. 3 5. Paragraph 1 a) of Resolution Conf. 16.7 (Rev. CoP17):

- 1) SA should work with the MA to intensify awareness and sensitization campaigns and set appropriate systems to monitor, evaluate and review forestry and wildlife legal instruments to ensure that they are CITES compliant.
- 2) Develop a comprehensive listing of all CITES endangered species and make them available to local communities and stakeholders.
- 3) Follow Forestry Industries Corporation's model that was used during and immediately after colonial era for sustainable harvesting, exportation and management of tree species.
- 4) Enhance institutional coordination and build strong collaboration between state and non-state actors in the implementation of the provisions in the CITES's resolutions and requirements.
- 5) Build the capacity of state and non-state actors, monitors and security at border crossing points and increase their presence.
- 6) Encourage university students and researchers to focus their research topics on *P. erinaceus* and other CITES listed species leading to publication.

7) Broaden the membership of the SA to include other institutions apart from the Faculty of Pure and Applied Sciences FBC such as the School of Natural Resources Management at NU, Fisheries/Marine Resources, Sierra Leone Agricultural Research Institute etc. as and when needed. Apart from Interpol, Law Officer Officers Dept, it will be prudent and more effective to also expand and broaden the scope and membership of the EA to include other entities such as the Law Reform Commission.

8) Conduct an inventory of standing stock, establish an estimate of take-off and institute a scientific monitoring system of the harvested and non-harvested stock. Based on inventory of the standing stock level, Sierra Leone should establish a revised conservative quota and estimate a sustainable take-off. This can be factored in the National Forest Inventory planned to start in April, 2023.

9) Introduce technologies (example chain of custody) - that will help monitor timber from different locations (chiefdoms, districts and regions) and establish Border Control and Confiscation Centres at strategic crossing points – airport and introduce Forest Monitoring tools;

10) Coordinate with CITES authorities to intensify compliance to the international trade of this species and establish reporting system using free lines

11) SA should follow the nine steps outlined in CITES Non-detriment Findings for Timber Version 3.0 and depending upon previous assessment report progress from step 1 to 5, progress to stage 9 and make the NDF. See Figure 1: NDF nine steps (Source: Bundesamt für Naturschutz (BfN), Federal Agency for Nature Conservation URL: <http://www.bfn.de>)

12) Submit a comprehensive report to the Secretariat on its action to implement the provisions of Article IV indicating that the lifting of the suspension and subsequent resumption of harvest and exportation will not jeopardize the survival of the species population and management actions will be incorporated to increase the stock level;

Furthermore, once exports are underway, the SA must monitor the actual levels of export and institute species artificial regeneration to ensure that the species is maintained throughout its range at a level consistent with its role in the ecosystem.

CHAPTER 7

REFERENCES

Note: The text of the Convention, Resolutions, Notifications and Standing Committee Documents are included in the References as CITES (year) and the access link, in the Thesis they are directly mentioned for better understanding.

Adjonou, K., Ali, N., Kokutse, A.D., Novigno, S.K. & Kokou, K. (2010). A Study of the Dynamics of Overexploited Natural Stands of *Pterocarpus erinaceus* Poir. (Fabaceae) in Togo. *Bois et Forêts des Tropiques*, 306, 45-56. Accessed from <https://doi.org/10.19182/bft2010.306.a20431>

Blinker, L. (2006). Country Environmental Profile (CEP) Sierra Leone. *Consortium Parsons Brinckerhoff. European Commission, Brussels*. Accessed from <https://europa.eu/capacity4dev/file/32962/download?token=49VpV7Nw>

CITES (1975). Text of the Convention. Accessed from: [Convention on International Trade in Endangered Species of Wild Fauna and Flora | CITES](#)

CITES (2021). Notification to the Parties No. 2022/021 [Expedited application of Article XIII for West African rosewood *Pterocarpus erinaceus* for all range States](#)

CITES (2022). Notification No. 2022/046 [Expedited application of Article XIII for West African rosewood *Pterocarpus erinaceus* for all range States](#)

CITES (2022). *Review of significant trade in specimens of appendix-II species*. Standing Committee meeting 75 (SC75), Panama, November 2022, SC75 Doc. 8 https://cites.org/sites/default/files/documents/E-SC75-08_0.pdf

CITES (2022). *Review of significant trade in specimens of appendix-II species*. Standing Committee meeting 75 (SC75), Panama, November 2022, SC75 Doc. 7.2.1 (Rev.1) https://cites.org/sites/default/files/documents/E-SC75-07-02-01-R1_0.pdf

CITES (2022). [Summary record](#) . Standing Committee meeting 74 (SC74), Lyon, March 2022 [SC74 \(cites.org\)](#)

CITES (2023). Resolution Conf. 10.16 (Rev. CoP19) [Specimens of animal species bred in captivity](#)

CITES (2023). Resolution Conf. 10.20 [Frequent cross-border movements of personally owned live animals](#)

CITES (2023). Resolution Conf. 10.21 (Rev. CoP19) [Transport of live specimens](#)

CITES (2023). Resolution [Conf. 10.3 Designation and role of the Scientific Authorities](#)

CITES (2023). Resolution Conf. 11.15 (Rev. CoP18) [Non-commercial loan, donation or exchange of museum, herbarium, diagnostic and forensic research specimens](#)

CITES (2023). Resolution Conf. 11.20 (Rev. CoP18) [Definition of the term 'appropriate and acceptable destinations'](#)

CITES (2023). Resolution Conf. 11.3(Rev. CoP18) [Compliance and enforcement](#)

CITES (2023). Resolution Conf. 12.10 (Rev. CoP15) [Registration of operations that breed Appendix-I animal species in captivity for commercial purposes](#)

CITES (2023). Resolution Conf. 12.3 (Rev. CoP19) [Permits and certificates](#)

CITES (2023). Resolution Conf. 12.8 (Rev. CoP18) [Review of Significant Trade in specimens of Appendix-II species](#)

CITES (2023). Resolution [Conf. 13.2 \(Rev. CoP14\) Sustainable use of biodiversity: Addis Ababa Principles and Guidelines](#)

CITES (2023). Resolution Conf. 13.6 (Rev. CoP18) [Implementation of Article VII, paragraph 2, concerning 'pre-Convention' specimens](#)

CITES (2023). Resolution Conf. 13.7 (Rev. CoP17) [Implementation of Article VII, paragraph 2, concerning 'pre-Convention' specimens](#)

- CITES (2023). Resolution Conf. 14.6 (Rev. CoP16) [Introduction from the sea](#)
- CITES (2023). Resolution Conf. 14.7 (Rev. CoP15). [Management of nationally established export quotas](#)
- CITES (2023). Resolution Conf. 16.7 (Rev. CoP17) [Non-detriment findings](#)
- CITES (2023). Resolution Conf. 16.8 (Rev. CoP17) [Frequent cross-border non-commercial movements of musical instruments](#)
- CITES (2023). Resolution Conf. 18.7 (Rev. CoP19) [Legal acquisition findings](#)
- CITES (2023). Resolution Conf. 5.10 (Rev. CoP19) [Definition of 'primarily commercial purposes'](#)
- CITES (2023). Resolution Conf. 9.19 (Rev. CoP15) [Registration of nurseries that artificially propagate specimens of Appendix-I plant species for export purposes](#)
- CITES (2023). Resolution Conf. 9.6 (Rev. CoP19) [Trade in readily recognizable parts and derivatives](#)
- CITES (2023). Resolution Conf. 9.7 (Rev. CoP15) [Transit and transshipment](#)
- Constitution of Sierra Leone (1991). [THE CONSTITUTION OF SIERRA LEONE.docx](#) Accessed from [Laws of Sierra Leone | Legislative Process | Parliament of Sierra Leone](#)
- Dumenu, W. K. (2019). Assessing the impact of felling/export ban and CITES designation on exploitation of African rosewood (*Pterocarpus erinaceus*). *Biological Conservation*, 236, 124–133. Accessed from <https://doi.org/10.1016/j.biocon.2019.05.044>
- Duvall, C.S. (2008). *Pterocarpus erinaceus* Poir. In Louppe, D., Oteng-Amoako, A.A. & Brink, M. (Eds). PROTA (Plant Resources of Tropical Africa), Wageningen, The Netherlands. Accessed from: <https://www.scirp.org/%28S%28czeh2tfqyw2orz553k1w0r45%29%29/reference/referencespapers.aspx?referenceid=2597252>

- Foray-Musa, B. S. (2016). *Assessing stakeholder awareness and national compliance of CITES in Sierra Leone*. Master Thesis, Library of the Universidad Internacional de Andalucía.
- Forest Policy (2010). *Sierra Leone*. Accessed from: https://s3-eu-west-1.amazonaws.com/rdwebsite/slforestry/ForestryPolicyFinal_21July2010.pdf
- Gabler, R. E, Petersen J.F. & Trapasso L.M. (2006). *Essential of Physical Geography*. 688 pp. Cengage Learning, 2006. ISBN: 0495110043, 9780495110040. Accessed from https://books.google.com.ng/books/about/Essentials_of_Physical_Geography.html?i=d=XJxqAAAACAAJ&redir_esc=y
- Global Biodiversity Information Facility (GBIF) Secretariat (2013). GBIF Backbone Taxonomy, 1st July 2013 - *Pterocarpus erinaceus* Poir. Georeferenced data. Accessed from: <http://www.gbif.org/species/5349317>
- Habou, R., Bationo, B., Abdou, L., Novinyo, S., Adjonou, K., Kokutse, A., Mahamane, Ali & Kokou, K. (2017). Vegetative propagation by aerial layering of *Pterocarpus erinaceus*: in the Sudanian zone. *International Journal of Recent Advances in Multidisciplinary Research*. 04. 2902-2908. Accessed from: [\(PDF\) Vegetative propagation by aerial layering of Pterocarpus erinaceus: in the Sudanian zone \(researchgate.net\)](#)
- Heinen, J.L., Coco, M.W., Marcuard, M. S., White, D. N., Peterson, M. N., Ryan A. Martin, R.A., & Langerhan, R.B. (2013). Environmental drivers of demographics, habitat use, and behavior during a post-Pleistocene radiation of Bahamas mosquitofish (*Gambusia hubbsi*). *Evol. Ecol.* Springer Science+Business Media Dordrecht 2013. Accessed from: <http://gambusia.zo.ncsu.edu/readings/Heinen%20et%20al%202013.pdf>
- Interpol (2015). Interpol operations target timber trade in Africa and America. Accessed from: [INTERPOL operations target illegal timber trade in Africa and the Americas](#)
- John, T.D. (2019) [Assessing awareness amongst critical stakeholders on the CITES implementation in Nigeria](#) [Tesis de Master, Universidad Internacional de Andalucía] <https://dspace.unia.es/browse?authority=2432&type=author>

- Kamara, Y.H (2019) *Assessing gaps, challenges and priorities for effective implementation of CITES in Sierra Leone*. Tesis de Master, Biblioteca de la Universidad Internacional de Andalucía.
- Kokou, J., Atsri, H., Adjonou, K., Raoufou, A., Dzifa, A., Nuto, Y., & Kokou, K. (2011). Impact of Charcoal Production on Biodiversity in Togo (West Africa). InTech EBooks. <https://doi.org/10.5772/22969>
- Mark, J., Newton, A.C., Oldfield, S. & Rivers M. (2014). A Working List of Commercial Timber Tree Species. Botanic Gardens Conservation International Descanso House, 199 Kew Road, Richmond, TW9 3BW, UK. Accessed from: [TimberWorkingList_v2DImage.pdf \(bgci.org\)](https://www.bgci.org/workinglist/v2DImage.pdf)
- Mc Sweeney, C., New, M. & Lizcano, G. (2006). UNDP climate change country profiles, 2006. Accessed from: [UNDP Climate Change Country Profiles: Ethiopia - UNT Digital Library](https://www.un.org/development/dcpd/undp-climate-change-country-profiles-ethiopia)
- NDC (2022). *Countries of the world by their position on the ND-GAIN Country Index* <https://gain-new.crc.nd.edu/>
- Nijman, V. & Shepherd, C. (2009). Wildlife trade from ASEAN to the EU: Issues with the trade in captive-bred reptiles from Indonesia. Accessed from [https://www.researchgate.net/publication/233726944 Wildlife trade from ASEAN to the EU Issues with the trade in captive-bred reptiles from Indonesia](https://www.researchgate.net/publication/233726944_Wildlife_trade_from_ASEAN_to_the_EU_Issues_with_the_trade_in_captive-bred_reptiles_from_Indonesia)
- OCHA Humanitarian Information Centre (2001). Chiefdom map of Sierra Leone Relief Web. Accessed from: <https://reliefweb.int/map/sierra-leone/sierra-leone-chiefdom-names-geo-codes-20-april-2001>
- Ouinsavi, C., Bienvenue, N. S., Kuiga, S., Appolinaire, A. W., Towanou, H., Akin, Y. & Justin, D. (2021). Traditional uses of African rosewood (*Pterocarpus erinaceus* Poir. *Fabaceae*) through the sociolinguistic groups and the pathways of conservation and sustainable management in Benin. *International Journal of Biodiversity and Conservation*. 13 (4): 200-213. DOI:10.5897/IJBC2021.1509. Accessed from:

<https://www.researchgate.net/publication/356759571> Traditional uses of African rose wood *Pterocarpus erinaceus* Poir Fabaceae through the sociolinguistic groups and the pathways of conservation and sustainable management in Benin

Sanon, A. (2022). Capacity building of national Task Forces in combating wildlife crime. (Liberia). Accessed from: <https://www.linkedin.com/pulse/capacity-building-national-task-forces-combating-crime-sanon-phd>

Scientific Authority of Sierra Leone (2022). *Heat map of NDF Survey on Pterocarpus erinaceus, Sierra Leone. Bing images*

Segla, K.N., Kokutse, A. D., Adjonou, K., Langbour, P., Chaix, G., Guibal, & Kokou, K. (2015). Biophysical characteristics of *Pterocarpus erinaceus* Poir. timber in Togo's Guinean and Sudanian zones. ResearchGate. Accessed from: <https://www.researchgate.net/publication/292400683> Biophysical characteristics of *Pterocarpus erinaceus* Poir timber in Togo's Guinean and Sudanian zones

Treanor, N.B. (2015). China's Hongmu consumption boom: analysis of a Chinese rosewood trade and links to illegal activity in Tropical Forested Countries. Forest Trends and UK Aid <https://www.readkong.com/page/china-s-hongmu-consumption-boom-analysis-of-the-chinese-8696851>

UNEP Law and Environment Assistance Platform. (1988). *Forestry Act, 1988*. FAL No. 38, 1989, pp. 157-162. Accessed from: <http://faolex.fao.org/docs/pdf/sie5732.pdf>

UNEP Law and Environment Assistance Platform. (1990, November 21) *Forestry Regulations, 1989 (P.N. No. 17 of 1990)*. Accessed from: <https://leap.unep.org/countries/sl/national-legislation/forestry-regulations-1989-pn-no-17-1990>

Wildlife Conservation Act (1972). Sierra Leone Wildlife Conservation Act (No. 27 of 1972). Ecolex. Accessed from : <https://www.ecolex.org/details/legislation/wildlife-conservation-act-1972-no-27-of-1972-lex-faoc041659/.sie41659.pdf> (fao.org).

Winfield, K., Grayson, C., & Scott, M. (2016). CITES CoP17. Information Document 48 - Global Status of *Dalbergia* and *Pterocarpus* Rosewood Producing. ResearchGate. Accessed from: <https://doi.org/10.13140/RG.2.2.24590.00321>

Wolf, D., Oldfield, T., & McGough, N. (2018). *NDF nine steps*. Bundesamt für Naturschutz (BfN), Federal Agency for Nature Conservation. <http://www.bfn.de>. Accessed from: [CITES Non-detriment Findings for Timber \(squarespace.com\)](https://www.squarespace.com)

APPENDICES

Appendix 1: Survey Questionnaire

1. Household questionnaire

HOUSEHOLD SURVEY QUESTIONNAIRE

Roadmap for the Non-Detrimental Findings for the sustainable harvesting of *Pterocarpus erinaceus*

Section A: Identification

A1	Name of Community/Village	
A2	Section	
A3	Chiefdom	
A4	Name of Interviewer	
A5	Interview Date - DD/MM/YY	
A6	Respondent Name	
A7	Gender - tick	1=Male 2=Female

Section B: Demographic and general information – tick

No	Question	Response	Response Code
B1	Household Type	1=Male headed 2=Female headed	
B2	What is your age?	1 =Less than 18 years 2=18 but less than 35 3=35 but less than 60 4=60 and above	
B3	What is your marital status?	1=Single 2=Married 3=Divorced 4=Widowed 5=Separated	

B4	What is your highest level of education?	1= never went to school 2=non formal 3=primary education 4=junior secondary education 5=senior secondary education 6=vocational education 7=college education 8=university education
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Section C: Outcome 1: Knowledge, issues, challenges, opportunities and recommendations in CITES compliance in the management of *Pterocarpus erinaceus* in Sierra Leone

C1	Do you know <i>Pterocarpus erinaceus</i> ?	1=yes 2=no>
C2	If yes, do you have it in your community?	1=yes 2=no> 3=I don't know>
C3	Are you involved in it harvesting?	1=yes 2=no>
C4	If yes, list 5 key challenges involved in the harvesting of <i>Pterocarpus erinaceus</i> .	1. 2. 3. 4. 5
C5	List 5 benefits involved in the harvesting of <i>Pterocarpus erinaceus</i> .	1. 2. 3. 4. 5
C6	Provide an estimate of the total number of <i>P. erinaceus</i> tree species that have been harvested in your family land since the start of trade.	A) Over 1500 tree species B) 1200 tree species C) 900 tree species D) 600 tree species

		E) 500 tree species F) Less than 500 tree species
C7	Rate the current population state of <i>Pterocarpus erinaceus</i>	1=increasing 2=decreasing
C8	Should the harvesting and exportation be banned?	1=yes 2=no> 3=I don't know>
C9	If yes, why?	
C10	If not, why?	
C11	Who is benefiting from this harvesting and trading?	1=landowners 2=chiefs 3=local community 4=local agent/loggers 5=exporters 6=outside buyers 7=government
C12	Are you aware of any international law that protect <i>Pterocarpus erinaceus</i> ?	1=yes 2=no> 3=I don't know>
C13	If yes, list any	
C14	If, yes, do you obey these international laws you mentioned?	1=yes 2=no>
C15	Are you aware of any national laws that protect <i>Pterocarpus erinaceus</i> ?	1=yes 2=no>
C16	Are you aware of any local laws that protect <i>Pterocarpus erinaceus</i> ?	1=yes 2=no> 3=I don't know>

C17	If yes, are the laws effective?	1=yes 2=no> 3=I don't know>
C18	If no, why are they not effective?	
C19	Do you know the government entities responsible for the conservation, protection and management of <i>P. erinaceus</i> in SL?	1=yes 2=no> 3=I don't know>
C20	List any two of these entities	
C21	List 5 opportunities for compliance in the management of <i>Pterocarpus erinaceus</i> in Sierra Leone.	1. 2. 3. 4. 5.
C22	Do you have any knowledge about CITES?	
C23	List 5 barriers towards CITES Compliance in the management of <i>Pterocarpus erinaceus</i> in Sierra Leone.	1. 2. 3. 4. 5
C24	Give 5 recommendations that could be used to help in the sustainable harvesting of the species.	1. 2. 3. 4. 5
C25	Give 5 recommendations that could be used to help in the sustainable management of the species.	1. 2. 3.

		4. 5
C26	Provide any other relevant information.	

2. Focus Group Discussion checklist

FGD CHECKLIST

Roadmap for the Non-Detrimental Findings for the sustainable harvesting of *Pterocarpus erinaceus*

Section A: Identification

A1	Name of Community/Village	
A2	Section	
A3	Chiefdom	
A4	Name of Interviewer	
A5	Interview Date - DD/MM/YY	
A6	Total group number	Male= Female=
A7	Estimated number of houses	Total=
A8	Estimated number of households	Total=
A9	Estimated population	Total=

Section B: Outcome1: Knowledge, issues, challenges, opportunities and recommendations in CITES compliance in the management of *Pterocarpus erinaceus* in Sierra Leone

C1	Do you know <i>Pterocarpus erinaceus</i> ?	1=yes 2=no>
C2	If yes, do you have it in your community?	1=yes 2=no> 3=I don't know>
C3	Has the species been harvested here?	1=yes

		2=no>
C5	If yes, list 5 key challenges involved in the harvesting of <i>Pterocarpus erinaceus</i> .	1. 2. 3. 4. 5
C6	List 5 benefits involved in the harvesting of <i>Pterocarpus erinaceus</i> .	1. 2. 3. 4. 5
C7	Rate the current population state of <i>Pterocarpus erinaceus</i> .	1=increasing 2=decreasing
C8	Should the harvesting and exportation be banned?	1=yes 2=no> 3=I don't know>
C9	If yes, why?	
C10	Identify the treats facing the survival and management of the species	
C11	Who is benefiting more from this harvesting and trading?	1=landowners 2=chiefs 3=local community 4=local agent/loggers 5=exporters 6=outside buyers 7=government

C12	Have you ever nursed this species anywhere in this community?	1=yes 2=no>>
C13	If not, why?	
C14	Are you aware of any international law that protects <i>Pterocarpus erinaceus</i> ?	1=yes 2=no> 3=I don't know>
C15	If yes, list 2	1 2
C16	If yes, do the community obey those international laws you mentioned?	1=yes 2=no>
C17	Is the community aware of any national laws that protect <i>Pterocarpus erinaceus</i> ?	1=yes 2=no>
C18	Has the community any local laws that protect <i>Pterocarpus erinaceus</i> ?	1=yes 2=no> 3=I don't know>
C19	If yes, are the laws effective?	1=yes 2=no> 3=I don't know>
C20	If no, why are they not effective?	
C21	Do you know government entities responsible for the conservation, protection and management of <i>Pterocarpus erinaceus</i> in Sierra Leone?	1=yes 2=no> 3=I don't know>
C22	If yes, name any two?	1 2
C23	List 5 opportunities for compliance in the management of <i>Pterocarpus erinaceus</i> in Sierra Leone.	1. 2. 3.

		4. 5.
C24	Are you aware about CITES?	
C25	List 5 constraints towards CITES Compliance in the management of <i>Pterocarpus erinaceus</i> in Sierra Leone.	1. 2. 3. 4. 5
C26	Give 5 recommendations that could be used to help in the sustainable harvesting of the species.	1. 2. 3. 4. 5
C27	Give 5 recommendations that could be used to help in the sustainable management of the species.	1. 2. 3. 4. 5
C28	Provide any other relevant information.	

3. Key Informant Interview checklist

KII INTERVIEW CHECKLIST

Roadmap for the Non-Detrimental Findings for the sustainable harvesting of *Pterocarpus erinaceus*

Section A: Identification

A1	District	
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A2	Chiefdom	
A3	City/town	
A4	Name of Interviewer	
A5	Interview Date - DD/MM/YY	
A9	Name of respondent	
A10	Sex	1=Male 2=Female

Section B: Outcome 1: Knowledge, issues, challenges, opportunities and recommendations in CITES compliance in the management of *Pterocarpus erinaceus* in Sierra Leone

C1	Do you know <i>Pterocarpus erinaceus</i> ?	1=yes 2=no>
C2	If yes, please name the districts where it is found	
C3	Has the species been harvested in the districts identified above?	1=yes 2=no> 3=I don't know>
C4	If yes, list 5 key challenges involved in the harvesting of <i>Pterocarpus erinaceus</i> .	1. 2. 3. 4. 5
C5	List the threats facing the survival of <i>Pterocarpus erinaceus</i> .	

C6	Rate the current population state of <i>Pterocarpus erinaceus</i>	1=increasing 2=decreasing
C7	Are you aware of any research on the <i>P. erinaceus</i> population in your district?	1=yes 2=no> 3=I don't know>
C8	If yes, do you know the species population in your district	
C9	Who conducted the research?	
C10	When was it conducted?	
C11	Who funded the survey?	
C12	Should the harvesting and exportation be banned?	1=yes 2=no> 3=I don't know>
C13	If yes, why?	
C14	If not, why?	
C15	Have you ever nursed this species in any of your nurseries in this district?	1=yes 2=no>>
C16	If yes, how many did you nurse?	
C17	If yes, were they transplanted?	1=yes 2=no>
C18	If yes, how many?	
C19	If yes, please list 5 key challenges faced in the nursing and transplanting of this species.	1.

		2. 3. 4. 5.
C20	Are you aware of any international law that protects <i>Pterocarpus erinaceus</i> ?	1=yes 2=no> 3=I don't know>
C21	If yes, list 2	1 2
C22	If, yes, did your Ministry, Department or Agency implement those international laws?	1=yes 2=no>
C23	Did your Ministry, Department or Agency incorporate the harvesting and management of this species in any national laws?	1=yes 2=no>
C24	Is your Ministry, Department or Agency aware of any local laws that protect <i>Pterocarpus erinaceus</i> ?	1=yes 2=no> 3=I don't know>
C25	If yes, are the laws effective?	1=yes 2=no> 3=I don't know>
C26	If no, why are they not effective?	
C27	Is your Ministry, Department or Agency aware of any MA responsible for CITES compliance?	1=yes 2=no> 3=I don't know>
C28	Is your Ministry, Department or Agency aware of any SA responsible for CITES research and monitoring?	1=yes 2=no> 3=I don't know>
C29	List 5 opportunities for compliance in the management of <i>Pterocarpus erinaceus</i> in Sierra Leone.	1. 2. 3.

		4. 5.
C30	List 5 constraints towards CITES Compliance in the management of <i>Pterocarpus erinaceus</i> in Sierra Leone.	1. 2. 3. 4. 5
C31	Give 5 recommendations that could be used to help in the sustainable harvesting of the species.	1. 2. 3. 4. 5
C32	Give 5 recommendations that could be used to help in the sustainable management of the species.	1. 2. 3. 4. 5
C33	Provide any other relevant information.	

Appendix 2: List of communities where data was collected

Community	Number of respondents interviewed
Baladugu	2
Dogoloya	1
Kindia section	2
Musaia	1
Yanah section	1
Baladugu	18
Baladugu	7
Bassaia	38
Bassaia	2
Bend	1
Bendugu	1
Bendugu	38
Dogoloya	10
Dogoloya	2
Dogoloya section	2
Finaya	3
Gbawuria	12

Gbenikoro	1
Gbenikoro	9
Kassie	1
Kassie	7
Kayrifae section	4
Kayrifae section	1
Kayrifea	1
Kegbehma	10
Kelefey	1
KelefeySection	1
Kelefye section	1
Kelifey section	3
Kerefey	2
Kerefey section	15
Kerefey section	1
Kindia	2
Kindia loko	1
Kindia section	15
Kuru	1
Kuru section	9

Madgbo	1
Makunthanda	28
Makunthanda	12
Mannah	9
Mannah	1
Mannah 1	12
Mannah 2	1
Musaia	15
musaia	1
Musaia	1
Musia Section	1
Mamum	1
P C section	9
PC section	2
Simiria	10
Sinkunia 1	9
Tala	4
Tala section	6
Tin	1
Tinbo	6

Tinbo	13
Yanah	3
Yanah section	15
Yateya	2
Yateya	8
Yeareya	1
Yeriya	1
Total	400

Appendix 3: List of Participants for Inception Workshop on Thesis



GOVERNMENT OF SIERRA LEONE

MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE

55 WILKINSON ROAD, FREETOWN

**INCEPTION WORKSHOP ON A ROADMAP TOWARDS A NON-DETRIMENT FINDING FOR *Pterocarpus erinaceus* IN
SIERRA LEONE**

VENUE: FAO OFFICE, 38 A FREETOWN ROAD, WILBERFORCE, FREETOWN

DATE: 13TH DECEMBER 2022

PARTICIPANTS LIST

No	NAME	INSTITUTION	DESIGNATION
1	Victor K. Lebbie	Ministry of the Environment and Climate Change	District Forest Officer, Falaba
2	Mohamed S. Turay	Ministry of the Environment and Climate Change	Assistant District Forest Officer, Koinadugu
3	Augustin J. Bappie	Timber Association Sierra Leone	Secretary General
4	Sia Miatta Bona	Society for Gender Research and Advocacy for Justice	Gender Activist
5	Alhaji M. Siaka	Wetland International Africa	Project Manager

6	Andrew Bangura	Ministry of the Environment and Climate Change	Assistant District Forest Officer, Tonkolili
7	Tamba James Kellie	Green Climate Organization SL LTD	Secretary General
8	Yayah Mansaray	Ministry of the Environment and Climate Change	Assistant Director, Commercial Forestry
9	Alfred T. Jondie	Environment Protection Agency, Sierra Leone	Assistant Director
10	Amos D. Kamara	Ministry of the Environment and Climate Change	Conservator of Forest
11	Bintu Sia Foray	National Protected Area Authority	Conservation Manager
12	Ibrahim M. Koroma	Information Technology Officer	SHADE-SL
13	Aiah Wurie Kembay	Environment Protection Agency, Sierra Leone	Assistant Director
14	Ali Badara Massaquoi	Ministry of the Environment and Climate Change	District Forest Officer, Karene
15	Edward Sesay	Conservation Society Sierra Leone	Programme Manager
16	Abdulai Dauda	Conservation Society Sierra Leone	Assistant Biodiversity Officer
17	Yatta H. Kamara	National Protected Area Authority	Wetland Manager
18	Gbessay E.S Momoh	Food and Agricultural Organization/United Nations	Natural Resource Management Consultant
19	Edward Aruna	Reptile and Amphibian Programme Sierra Leone	Founder
20	Sahr J. Kellie	Ministry of the Environment and Climate Change	Deputy Director, Forestry

.....

Sahr J. Kellie

(Student)

Deputy Director of Forestry

