

*The Role of Non-Timber Forest Products (NTFPs) in
Community Livelihoods around the Gola Forest
National Park and Tiwai Island Wildlife Sanctuary:*

Current uses and future possibilities



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Abbreviations

CSSL	Conservation Society of Sierra Leone
EFA	Environmental Foundation for Africa
FIC	Forest Industries Corporation
GFP	Gola Forest Program
IUCN	International Union for Conservation of Nature
NGO	Non-Government Organisation
NTFP	Non-Timber Forest Product
SILETI	Sierra Leone Timber Industry and Plantation Company
OKNP	Outamba-Kilimi National Park
PRA	Participatory Rural Appraisal
RSPB	Royal Society for the Protection of Birds
SLNA	Sierra Leone National Archives
UAE	University of East Anglia
WAPFoR	Western Area Peninsula Forest Reserve
WHH	Welthungerhilfe

1. Introduction

1.1 Overview

Non-timber Forest Products (NTFPs) are harvested, consumed and traded throughout West Africa, providing important sources of food, fibre and medicinal materials as well as key supplements to rural household incomes with generally low environmental impacts. As a result, the exploitation of NTFPs for-profit presents an important avenue of opportunity for the development or enhancement of conservation-compatible alternative livelihoods in forest-edge communities. In the Sierra Leonean context, the Gola region is a key example – due to high levels of ecological diversity there is both a wide range of different local NTFPs and a significant conservation imperative, particularly given the recent elevation of the Gola Forest Reserves to National Park status. As Michael Arnold and Ruiz Perez note, “the contributions that non-timber forest products (NTFPs) can make to rural livelihoods, and the fact that their use is less ecologically destructive than timber harvesting, have encouraged the belief that more intensive management of forests for such products could contribute to both development and conservation objectives, and have led to initiatives to expand commercial use of NTFPs.”¹ Nevertheless, there has been considerable debate around how best to approach NTFP commercialisation as well as regarding their specific role in achieving desired forest conservation outcomes.² Perhaps the most important lesson that can be learned from such literature is that while the commercialisation of NTFPs certainly should not be understood as a panacea for improving forest community livelihoods and achieving conservation outcomes, it nevertheless can be a valuable *contributing factor* if conducted in a balanced and realistic manner. Following from the above, the objective of this study is to lay the groundwork for NTFP commercialisation in the Gola Forest area by developing an improved understanding of the socio-economic significance of NTFPs; suggesting new and innovative commercialisation approaches; exploring marketing channels, and; developing a community-based management plan for select NTFPs.

In a general sense, the term ‘Non-Timber Forest Product’ (NTFP) essentially refers to any subsistence or commercial item or material that is derived from a forest area, usually without actually felling trees. It often includes medicinal plants, construction materials (e.g., building poles, roofing thatch), fibre products (e.g., baskets, fishing nets), fuels (e.g. firewood, charcoal) and food products (e.g., berries, vegetables, nuts and bushmeat). In this report, however, we adopt a more constrained definition due to our particular objective of identifying NTFPs that can be commercially exploited in support of forest conservation goals. Specifically, bushmeat products have been excluded from the study and wood-based products such as poles, firewood and charcoal, have been given a lesser focus.³

¹ J. E. Michael Arnold and M. Ruiz Perez, "Can non-timber forest products match tropical forest conservation and development objectives?," *Ecological Economics* 39(2001).

² T. Sunderland and O. Ndoye, eds., *Forest Products, Livelihoods and Conservation: Case Studies of Non-Timber Forest Product Systems*, vol. 2 (CIFOR, 2004); K. Schreckenber et al., "Commercialisation of Non-Timber Forest Products: What Determines Success?," (ODI Forestry Briefing, 2006); S. Shackleton, P. Shanley, and O. Ndoye, "Invisible But Viable: Recognising Local Markets for Non-Timber Forest Products," *International Forestry Review* 9, no. 3 (2007); E. Marshall, A. C. Newton, and K. Schreckenber, "Commercialisation of non-timber forest products: first steps in analysing the factors influencing success," *International Forestry Review* 5, no. 2 (2003); E. Marshall et al., "Entrepreneurship in value chains of non-timber forest products," *Forest Policy and Economics* 8(2006); Michael Arnold and Ruiz Perez, "Can non-timber forest products match tropical forest conservation and development objectives?."

³ It is important to note that the harvesting of bushmeat and wood products from forest areas does not always correlate with ‘forest degradation,’ in fact when done on a subsistence or modest commercial scale it rarely does. Nevertheless, given the laws that govern both the Gola Forest National Park and Tiwai Island Wildlife Sanctuary, it was deemed best to either exclude or to have a diminished focus on these products for this study.

The field research project detailed in this report focused on the identification of key NTFPs in eight communities across the Gola Forest and Tiwai Island region. As a result, the report presents detailed information about their collection, processing and storage, their household and socio-economic significance, and existing levels of commercial trade in the key urban markets of Kenema and Freetown. As well, it contextualises these data with a thorough review of existing literature to produce a nuanced analysis of the trade in NTFPs across Sierra Leone. Building on this empirical foundation, it concludes with a critical analysis of the potential role of (increased) commercialisation of NTFPs in improving livelihoods in forest-edge communities and helping to achieve forest conservation objectives in the Gola area. In doing so, it examines the opportunities available in domestic, niche domestic and international markets as sales-points for such products and provides detailed suggestions on how increased commercialisation might be realised, and actions that would need to be undertaken by different NGO and local actors.

1.2 Case Study Area – The Gola Forest National Park and Tiwai Island Wildlife Sanctuary

The Gola Forest National Park and Tiwai Island Wildlife Sanctuary both lie within the tropical moist forest zone of Sierra Leone and, like most rainforest areas in the country, they are typified by emergent tree species such as *Heritiera utilis*, *Pitadeniastrum africanum* and *Uapaca guineensis*.⁴ While the region's early human history is only vaguely understood; it is generally believed that the area was originally inhabited by the Gola (speaking) people from the Mel Language group. From the 16th century onwards, however, this population was increasingly displaced by mass in-migration of the Mande (i.e., Mende) peoples from Guinea. Furthermore, it is also believed that during the 18th and early 19th centuries the Gola Forest area was home to a much larger population much of which was lost or scattered by local warfare during the mid-19th century. This demographic development appears to have had major impacts on vegetative dynamics and several historical sources indicate that a considerable proportion of the Gola region's current standing mature forest has regenerated on former agricultural land over the past couple of centuries.⁵

In the modern era, however, while agricultural activities continue to affect vegetation dynamics, the most dominant influence in the area has been a series of often paired – and frequently conflicting – efforts to develop large scale timber production and conservation-oriented controls over the area. The Gola forests first came under the colonial gaze in 1908, when the colonial forester A. H. Unwin travelled through the region noting both the timber stocks of the area as well as its potential to become a prominent site for recreational elephant hunting.⁶ As a result, within two decades administration of the Gola Forests was centralised through the establishment of the Gola West (62 km²) and East (228 km²) forest reserves in 1926 and the Gola North Forest Reserve (458 km²) in 1930.⁷ Interestingly, after the 1933 International Convention for the Protection of Fauna and Flora in London there was a short-lived proposal by the colonial government to transform part of the Gola Forest into a National Park or Game Reserve. This, however, was ultimately rejected as the colonial government considered that the animals were adequately protected by natural conditions and

⁴ P. S. Savill and J. E. D. Fox, *Trees of Sierra Leone* (Omagh, co. Tyrone, 1967).

⁵ D. Small, "Some ecological and vegetational studies in the Gola Forest Reserve, Sierra Leone" (The Queen's University of Belfast, 1953); A. G. Davies and P. Richards, "Rain forests in Mende life: resources and subsistence strategies in rural communities around the Gola North forest reserve (Sierra Leone)," (London: ESCOR, UK Overseas Development Administration, 1991); J. Fairhead and M. Leach, *Reframing deforestation: Global analyses and local realities with studies in West Africa* (London: Routledge, 1998).

⁶ A. H. Unwin, "Report on the Forest and Forestry Problems in Sierra Leone," (London: Waterlow and Sons Limited, 1909).

⁷ Five minor extensions were later made to the Gola North Forest Reserve between 1956 and 1963.

existing laws.⁸ In addition, it is important to note that a key part of the initial motivation for creating the Gola forests reserves was to secure a centralised forest estate for the country's timber production. Although the reserves' remote location prevented timber harvesting during the first three decades after their gazettment,⁹ major logging operations formally began in 1960 when the state-owned Forest Industries Department¹⁰ moved its centre of operations from the Kambui Hills Forest Reserve to the Gola North Forest Reserve.¹¹ As well, in 1977 the Italian/Sierra Leonean-owned company Sierra Leone Timber Industry and Plantation Company (SILETI) was given a 25 year concession to log the Gola West and East Forest Reserves.¹² The operations of both FIC and SILETI were often seen to be controversial due to serious neglect of best practice techniques and large-scale clear felling.¹³ While exact figures are hard to come by, it is estimated that during this period all of Gola West Forest Reserve was logged along with roughly ten to fifteen per cent of the Gola East and North Forest Reserves.¹⁴ Nevertheless, both of these operations came to a halt during the early 1980s: SILETI had a falling out with the central government and was kicked out of the country in 1983 while the operations of the state-owned FIC, which had a history of mismanagement, gradually ground to a halt over the same period – due not least to the deterioration of road infrastructure and the dismantling of the national railways.¹⁵

At the same time, the early 1980s also saw the re-emergence of interest in greater wildlife conservation in Sierra Leone and the Gola Forest region was quickly identified as a key conservation priority area.¹⁶ John Oates, a primatologist from City University of New York, was one of the earliest members of this environmental movement. During an early expedition to Sierra Leone he discovered that Tiwai Island had one of the highest concentrations of primates in Africa.¹⁷ After initially setting up a research station there, he worked with Peace Corp volunteers to create a tourism centre on the island and in 1988, after many years of work, the island was formally gazetted as a game sanctuary. It was Sierra Leone's first¹⁸ (and to date the only) game sanctuary to be declared under the *Wildlife Conservation Act*. Around this time, one of the early primate researchers on Tiwai Island, Glyn Davies, received funding from the World Conservation Union (IUCN) to research the potential of transforming the Gola Forest Reserves into a similar wildlife conservation area.¹⁹ The findings from this research were subsequently taken up by the UK-based Royal Society for the Protection of Birds (RSPB), who partnered with the local NGO Conservation Society of Sierra Leone (CSSL) to create the Gola Forest Programme (GFP), which started working towards the creation of a Gola Forest National Park.

⁸ SLNA: A/33/28, Colonial Communication discussing Wildlife Conservation in Sierra Leone, 1933

⁹ A. H. Ayodele Cole, "The Gola Forest In Sierra Leone: A Remnant of Tropical Rain Forest in Need of Conservation," *Environmental Conservation* 7, no. 1 (1980).

¹⁰ This would later become the Forest Industries Cooperation (FIC)

¹¹ I. Paul, "Report on the Forest Administration of Sierra Leone 1960/61," (Freetown: Government Printing Department, 1961).

¹² S. Stevens, "The Concessions Agreement for Gola Forest East and Gola Forest West, Forest Reserves (Ratification) Act," in 3, ed. Government of Sierra Leone (1977).

¹³ D. Juboku-Metzger, "Forest Exploitation in Sierra Leone: A Tale of Devastation," *The Ecologist* 13, no. 6 (1983).

¹⁴ A. G. Davies, *The Gola Forest Reserves, Sierra Leone: Wildlife conservation and forest Management* (Gland: IUCN, 1987).

¹⁵ P. G. Munro and G. Hiemstra-van der Horst, "Conserving Exploitation?: A Political Ecology of Forestry Policy in Sierra Leone," *The Australasian Review of African Studies* 32, no. 1 (2011).

¹⁶ Ayodele Cole, "The Gola Forest In Sierra Leone: A Remnant of Tropical Rain Forest in Need of Conservation."

¹⁷ J. Oates, *Myth and Reality in the Rain Forest: How Conservation Strategies are Failing in West Africa* (Berkeley: University of California Press, 1999).

¹⁸ J. F. Oates, "Sierra Leone's new sanctuary," *Oryx* 22, no. 1 (1988).

¹⁹ Davies, *The Gola Forest Reserves, Sierra Leone: Wildlife conservation and forest Management*.

Despite these strong starts, both the Tiwai and Gola conservation initiatives suffered significantly during the 1990s as a result of the country's long civil war (1991-2001). During much of this decade the Gola forest was home to important rebel strategic bases,²⁰ and the insurgents attacked Tiwai Island, ransacking both the tourism and research sites and destroying all of the buildings bringing wildlife conservation initiatives to a halt. Since the end of the war, however, there has been a renewed focus on improving wildlife conservation in the region. In 2002, just one year after the end of the civil war, the Sierra Leonean NGO Environmental Foundation for Africa (EFA) launched a project to restore Tiwai Island and since this time facilities have been rebuilt and the island now regularly hosts both tourists and researchers once again.²¹ RSPB and CSSL have also made progress with the Gola Forest Programme, and in 2011 the Gola Forest Reserves were collectively re-gazetted as Gola Forest National Park.²²

Despite these impressive achievements there remain great challenges to implementing sustainable wildlife conservation programs in Gola and Tiwai. One of the biggest problems has been the difficulties of obtaining firm support from forest-edge communities which have had some of their activities restricted by recent conservation initiatives.²³ In the efforts of conservation actors to sustainably resolve such conflicts, a key recent focus has been the identification and development of alternative ('forest friendly') livelihoods for these communities, to not only 'compensate' them for reduced access to their traditional forest resources, but also in the interest of general poverty reduction in the region. This is no small task, and this research project specifically examines the potential role of commercialising NTFPs in order to help achieve such an objective.

1.3 Previous NTFP research in Sierra Leone

There has actually been a reasonable amount of research conducted on NTFPs in Sierra Leone over the past couple of decades. Unfortunately, much of this research has been recorded in hard-to-access 'grey literature' publications or filed away PhD Theses, meaning its ability to help inform and shape forest livelihood and conservation initiatives has been very limited. This section of the report therefore seeks to provide a succinct overview of this literature, drawing out specific themes to enhance and contextualise the analysis of data collected during field research for the current project.

One of the earliest studies of NTFPs in Sierra Leone was conducted in the 1990s as a part of a research expedition to the Loma Mountains in Sierra Leone by researchers from the University of East Anglia (UEA).²⁴ Through interview data and observations, the team identified 132 different tree species being utilised for NTFPs, the vast bulk of which were medicinal in nature. Most of these NTFPs were collected from secondary forest or farm bush, with only a very small minority harvested from Loma Mountain's mature forest areas. The main exception was with food NTFPs, which were often collected along paths through the mature forest when people were travelling from village to village. The commercialisation of these NTFPs appeared to be very limited (most were used for subsistence), although the researchers did note that the nuts of the *Garcinia kola* tree, sometimes

²⁰ P. Richards, "Are 'Forest' Wars in Africa Resource Conflicts? The Case of Sierra Leone," in *Violent Environments*, ed. N. Lee Peluso and M. Watts (Cornell University Press, 2001).

²¹ P. G. Munro, "Protected area management and community development in Tiwai," *Africa News*, 27 July 2007.

²² M. Massaquoi, "Sierra Leone: President Koroma Launches Gola Forest National Park," *Concord Times*, 5 December 2011.

²³ A. Crawford, O. Brown, and H. Finlay, "Conflict-Sensitive Conservation in Gola Rainforest National Park: Workshop Report," (Kenema: UNEP, RSPB, CSSL and GoSL, 2011).

²⁴ P. Atkinson et al., eds., *Landuse and Conservation in the Mount Loma Reserve, Sierra Leone* (University of East Anglia, 1996).

used as a male aphrodisiac, did have some economic importance. It is worth noting that Alie P. Koroma, a Sierra Leonean who was a part of the UEA team, also conducted a second NTFPs study, in the Outamba Kilimi National Park (OKNP), for his Master's thesis at the Dresden University of Technology.²⁵

Arguably the most comprehensive study of NTFPs in Sierra Leone, however, is that conducted by Dr Aiah Lebbie, focusing on the exploitation of the Western Area Peninsula Forest Reserve (WAPFoR), which borders Freetown, Sierra Leone's capital and largest city.²⁶ In his findings, Lebbie notes how WAPFoR was being heavily exploited for NTFPs largely due to: a) the recent influx of people displaced by the civil war who were searching for new livelihoods in the area, and; b) its close proximity to Freetown, the country's largest market for NTFPs. He notes how the collection of NTFPs provides an important contribution to these people's 'productive bricolage,' especially for female-headed households. Although WAPFoR is a relatively small Forest Reserve (especially in comparison to Gola National Park), Lebbie found great diversity between the various groups involved in terms of which of the available NTFPs were collected and with what methods – differences that were particularly evident between groups of different location (i.e., different villages have specialities), ethnicity (e.g., Limbas focusing on Palm Wine); Fulas focusing on firewood; Lokos focusing on Charcoal) and gender (i.e., men and women collected different NTFPs). Lebbie identifies 108 different tree species that were targeted for NTFPs, with medicines as by far the most commonly harvested product while fuelwood, food and construction materials were also widespread. In particular, he gives special emphasis to six specific trees that have multidimensional qualities for producing NTFPs: *Xylopiya aethiopica* (medicinal and edible fruits); *Xylopiya quintasii* (fuelwood, poles and medicinal); *Phyllocosmus africanus* (medicinal charcoal); *Anisophyllea Laurina* (edible fruits, poles and medicinal); *Garcinia kola* (edible fruits, medicinal); *Parinari excels* (charcoal, edible fruits and medicinal); and *Elaeis guineensis* (palm wine, palm oil, fibre and construction materials.). In terms of commercialisation, the collection of fuelwood (especially firewood, but also charcoal) was identified most important income generator; however, palm wine was also prominent, especially among specific ethnic groups.²⁷

There has also been a previous study on NTFPs in WAPFOR published in 1985 by Cyrus MacFoy, with a specific focus on one peninsula village (Gloucester) and medical NTFPs. His paper describes how different NTFPs were utilised to concoct remedies for a variety of different ailments. He also notes that while many collected these NTFPs for subsistence purposes there was some commercialisation, with a number of villagers travelling to Freetown to sell their products. They even reported to have obtained license from the Freetown City Council, giving them the legal right to publicly sell their medicines.²⁸

Over a decade has passed since Lebbie conducted his NTFP study in WAPFOR, and while no major study of NTFPs in WAPFOR has been conducted since, there have been some important recent

²⁵ A. P. Koroma, "The role of non-timber forest products in enhancing the participation of the local community in conservation efforts: A case study of two rural communities in the proposed Outamba-Kilimi National Park" (Technische Universität Dresden, 1997).

²⁶ A. R. Lebbie, "Distribution, Exploitation and Valuation of Non-Timber Forest Products from a Forest Reserve in Sierra Leone" (University of Wisconsin, 2001).

²⁷ Also see: A. R. Lebbie and R. P. Guries, "The palm wine trade in Freetown, Sierra Leone: production, income, and social construction," *Economic botany* 56, no. 3 (2002).

²⁸ C. MacFoy, "Medical ethnobotany of Gloucester Village (Sierra Leone)," *Africana Research Bulletin* 14, no. 1-2 (1985).

developments that would have affected exploitation patterns. First, and foremost, there have been renewed efforts to enforce WAPFoR conservation regulations, including concerted efforts to crack down on fuelwood harvesting activities. At the same time, there has been increased production of commercial fuelwood (i.e., charcoal and firewood) in Sierra Leone's provinces, which now supply the bulk of Freetown's demand.²⁹ Thus fuelwood is likely a less significant NTFP from the reserve. Therefore, the impacts of NTFP (over)exploitation on the reserve's ecological integrity have ultimately become a secondary concern, while the rapid urban expansion of Freetown has emerged as the primary threat.³⁰ Second, there has been a spread of exotic tree species (primarily *Acacia spp.* and to some extent *Gmelina arborea*) alongside and within the reserve as a product of misguided plantation programs by non-local domestic and international agencies. This is a concern due to the low utility of *Acacia spp.* to local residents and the potentially invasive characteristics of these exotics, particularly *Gmelina arborea*. Nevertheless, even with these contemporary factors in mind, it is evident from Lebbie's research that the 'protected' forests of the WAPFoR are extremely productive for the surrounding communities and Freetown, generating important sources of income for low-income households.

In addition to his PhD work, Lebbie has also conducted research on the presence of NTFPs in sacred groves across Sierra Leone.³¹ These sacred groves are maintained by the secret societies (e.g., *Poró*, *Gbangbanii*, *Bondo*, *Sande*, etc.) of Sierra Leone's various ethnic groups and are used as sites for initiation ceremonies, spiritual rites, and adolescent education. They are also used for herbalist training and sourcing and as 'traditional hospitals' – places to bring ill community members for specialised treatment. Through this research, Lebbie and others identified 15 key plant species³² that are harvested for numerous different ailments. More recent research on sacred groves in Sierra Leone's Bombali District also confirms this, noting that around 70% of plants species sampled during surveys of sacred groves were locally considered to be medicinal plants. Interestingly, the research also revealed that sacred groves closer to the urban centre of Makeni had gone through some fundamental changes in the past couple of decades and had often become sites for the growing, selling and smoking of marijuana (another commercially important 'NTFP' in Sierra Leone that receives very little scholarly attention).³³

The Gola Forest has been the most heavily researched area in Sierra Leone in terms of NTFPs. This is perhaps unsurprising due to its geographical size and its national and international conservation significance. One of the earliest Gola NTFP studies was conducted by Glyn Davies and Paul Richards during the late 1980s.³⁴ Focusing on 12 villages in the Gaura, Malema, and Nomo Chiefdoms (located

²⁹ P. G. Munro and G. A. van der Horst, "The Domestic Trade in Timber and Fuelwood Products in Sierra Leone: current dynamics and issues" (Freetown: FAO/EU, 2012).

³⁰ P. G. Munro, "Deforestation: Constructing Problems and Solutions on Sierra Leone's Freetown Peninsula," *The Journal of Political Ecology* 16, no. 1 (2009).

³¹ A. R. Lebbie and R. P. Guries, "Ethnobotanical value and conservation of sacred groves of the Kpaa Mende in Sierra Leone," *Economic botany* 49, no. 3 (1995); A. R. Lebbie and M. S. Freudenberger, "Sacred Grove in Africa: Forest Patches in Transition," in *Forest Patches in Tropical Landscapes*, ed. J. Schelas and R. Greenberg (Island Press, 1996); A. R. Lebbie and M. S. Freudenberger, "The Role of Sacred Groves in Biodiversity Conservation in Sierra Leone," in *African Sacred Groves: Ecological dynamics and Social Change* ed. M. J. Sheridan and C. Nyamweru (Oxford: James Currey, 2008).

³² *Ongokea gore*, *Dioscorea minutiflora*, *Crossandra butingii*, *Ochthocosumus africanus*, *Dracaena arborea*, *Ipomoea digitata*, *Solanum duplosinuatum*, *Catharanthus roseus*, *Hymenocardia lyata*, *Tragia tenuifolia*, *Scoparia dulcis*, *Acanthus montanus*, *Musa cavendishii*, *Tricalysia deightonii* and *Clerodendron scanderus*.

³³ A. Martín Martín et al., "The role of secret societies in the conservation of sacred forests in Sierra Leone," *Bois et Forêts des Tropiques* 310, no. 4 (2011).

³⁴ Davies and Richards, "Rain forests in Mende life: resources and subsistence strategies in rural communities around the Gola North forest reserve (Sierra Leone)."

to the north-east of the current project's target chiefdoms: Tunkia, Makpele, Koya) around what was formerly known as the Gola North Forest Reserve, they provide detailed information on the different NTFPs used for building materials and foods. Interestingly, they note that the four main species used for building materials (*Harungana madagascariensis*, *Musanga cercropioides*, *Margaritaria discoidea*, and *Anisophyllea laurina*) did not come from mature forests areas, but rather farm fallow land. In terms of NTFP foods stuffs (berries, fruits, etc.), they noted that there was very little commercialisation and less than one per cent of these products were reported as being traded. They did note some small trade in forest foodstuffs occurring at Lalehun and Sembahun; however, this trade was largely dominated by sales of bushmeat. In addition, Davies and Richards also surveyed NTFP markets in Kenema in which they observed numerous medicines (usually for treating jaundice and malaria) derived from nearly a dozen different trees.³⁵ They noted, however, that very few of these were sourced from the Gola forest, as the Kambui Hills Forest Reserve offers a much more practical source for these products as it is adjacent to Kenema.³⁶ Given this situation, Davies and Richards argue that opportunities for commercialising medicinal NTFPs from the Gola forest were essentially limited to products that come from rarer trees such as *Enantia polycarpa* (used to treat malaria and liver disorders), while *Calancoma echindta* (for medicines and cosmetics) and *Pentalthra macrophylla* (for oil seeds) were also mentioned.

Drawing upon Davies and Richards' research, a Gola Forest Reserve management plan drafted in 1993 dedicates a considerable amount of attention the potential of NTFP commercialisation.³⁷ The plan notes that promoting trade-oriented NTFP harvesting from reserve buffer zones could aid in promoting goodwill toward the reserve areas among Gola's forest-edge communities and provide revenue for the Forestry Division. In addition, it provides a list of 27 species in particular that could be commercially harvested from these areas.³⁸ The plan's focus, however, is not on production for domestic markets, but rather to form links with international buyers with the Forestry Division acting as a facilitator. Although the report mentions some international companies showing interest at the time no practical progress was made likely due to the escalation of the Sierra Leone civil war that considerably interrupted reserve management activities.

During the early 1990s there were also two studies by PhD researchers conducting extensive studies of forest use in the Gola area. The first was by anthropologist Melissa Leach, who examined gender relations in the Gola North Forest Reserve with a focus on the village of Madina.³⁹ In a text derived from Leach's PhD Research, one chapter provides a specific examination of NTFPs in Madina. In terms of NTFP foodstuffs, Leach notes how the collection of different leaves to make flavoured sauces is most common, but that during times of hunger staple foods are also sourced from the bush, particularly 'bush yams' (*Dioscorea spp.*). She particularly notes how the collection, processing

³⁵ This included the tree species: *Ecantia polycarpa*, *Nauclea latifolia*, *Landolphia calabrica*, *Morinda morindoides*, *Morinda geminate*, *Xylopiya aethiopicana*, *Alternanthera sessilis*, *Cratispermum laurinum*, *Cassia sieberiana*, and *Salacia sengalensis*

³⁶ There has been a research project conducted on NTFPs in Kambui Hills conducted in the past; however, we were unable to get a hold of this document for this research: M. Graziani, "The uses of non-timber forest products (NTFP) among three Mende villages around the Kambui Hills Forest Reserve, Sierra Leone," (London: UCL, 1993).

³⁷ M. Illes, P. Savill, and G. Koker, "Gola Forest Reserves Sierra Leone, Interim Management Plan," (Sandy: RSPB, 1993).

³⁸ *Ceiba pentandra*, *Gloriosa superba*, *Cola spp*, *Rauvolfia vomitoeia*, *Pycnanthus angolensis*, *Voacanda Africana*, *Xlopiya spp*, *Laccosperma secundiflorum*, *Aframomum meleguetta*, *Eremospatha macrocarpa*, *Pentadesma butyracea*, *Raphia palma-pinus*, *Strophanthus gratus*, *Alchornea cordifolia*, *Capscium frutescens*, *Physostigma venenosum*, *Ricinus communis*, *Chichona spp*, *Eugenia spp*, *Zingiber officinale*, *Mitragyna spp*, *Carica papyra*, *Raphia hookeria*, *Raphia Vinifera*, *Daniellia thurifera*, *Sesemum indicum*, *Elaeis guineensis*.

³⁹ M. Leach, *Rainforest relations: gender and resource use among the Mende of Gola, Sierra Leone* (Edinburgh: Edinburgh University Press 1994); M. Leach, "Images of propriety: the reciprocal constitution of gender and resource use in the life of a Sierra Leonean Forest Villages" (University of London, 1990).

and utilisation of NTFPs is heavily divided along gender lines. Like Davies and Richards, however, Leach also notes that the commercial sale of Gola NTFPs in Kenema is very limited due to competition from the more strategically located Kambui Hills Forest Reserve and that overall NTFPs are much less commercialised in Sierra Leone than in other West African countries. Nevertheless, she did find some limited trade in baskets, mats and medicinal materials from Gola North to Kenema. According to Leach, most who were involved in this trade were wives and young and/or poor men – marginalised groups that did not have access to more ‘traditional’ income generating opportunities such as cocoa and coffee growing as well as timber sales. As well, during the late dry season, women also occasionally sold seeds⁴⁰ and fruits⁴¹ locally to supplement their incomes. Last but not least in importance, echoing previous NTFP researchers in Gola and Loma she finds that most NTFPs are actually gathered from secondary forest and bush fallow areas and only a very few are derived from mature forest.

The second PhD study was conducted by Dawn Hartley, whose project was linked to the Tiwai Island Wildlife Sanctuary project, and focused on forest resources and their subsistence use in Kambama (the closest village to Tiwai Island) and Nyeyama (Makpele Chiefdom), a village located near the Gola Forest West Reserve.⁴² Hartley’s research explored a wide range of different floral and faunal products that were consumed in the two case study villages. She notes in particular that while the range of exploited species is massive, *Harungana madagascariensis* and *Anisophyllea laurina* are especially important tree species for village construction needs. As well, bush yams and mushrooms were noted to be important dietary supplements; the former found only in farmbush, the latter in mature forests. In the context of the current study, perhaps Hartley’s most interesting finding is that all NTFPs exploited in these villages were used for subsistence purpose and never sold commercially largely due to the villages’ geographic isolation from urban trading centres. She notes that the then-planned construction of a Trans-African highway through Potoru could have opened up opportunities for more commercialisation (especially for in her case-study village of Kambama); but construction of this route has yet to occur.

Finally, there have also been a couple of recent rapid surveys on NTFPs in the Gola Forest.⁴³ One of these was conducted by the Gola Forest Programme in 2009 and involved a sampling survey across 140 Gola communities. The report is fairly light on details but does note that the tree species *Xylopia aethiopica*, *Pycnanthus angolensis*, *Ivengia gabonensis*, and *Ricinodendron heudelotii* were heavily targeted for NTFPs by almost all of the sampled communities. A second survey, conducted by the Environmental Foundation for Africa (EFA) in 2010 produced some interesting results. As in many of the earlier reports on NTFPs in Gola, Bush Yam emerged as an important NTFP for most communities but its value was mainly for subsistence (a stop-gap food used during the ‘hungry season’) rather than as a tradable commodity. Interestingly, however, the findings indicate the emergence of a new NTFP that had not been mentioned in previous studies – honey. It was noted as the most important NTFP product after bush yams and by far the most important in terms of commercial sales. Also, in contrast to previous studies this project found that ‘primary bush’ was the main source of NTFPs rather than farmbush, and although the report is light on contextual detail this ‘change’ might be explained by the new importance of honey being collected from forest areas.

⁴⁰ From the trees: *Bussea occidentalis* and *Irvingia gabonensis*.

⁴¹ From the trees: *Parinari excels* and *Sacoglottis gabonensis*.

⁴² D. Hartley, "Forest Resource Use and Subsistence in Sierra Leone" (UCL, 1992).

⁴³ J. B. Kenneh, "Report on Survey of Non Timber Forest Products (NTFPs) in Gola Forest Communities," (Gola Forest Program, 2009).

From this survey of existing literature on NTFPs it is evident that Sierra Leoneans harvest a massive diversity of NTFPs from a wide diversity of tree species. What products are harvested and how they are processed also varies considerably by location, gender and ethnicity. However, what is evident, is that by far the vast majority of these NTFPs are consumed for subsistence purposes and the bulk of commercial NTFP production occurs in reserves near urban areas (e.g., Western Area Peninsula Forest Reserve, Kambui Hills Forest Reserve) and major trading routes. Fuelwood is also by far the most commonly commercialised NTFP. It is also interesting to note that the 'Forest Product' term in NTFP is somewhat of a misnomer, as most NTFPs are not actually collected from 'mature forests' but rather from farm bush and other communal areas in and around rural villages.

2. Research Findings

2.1 Research Methodology

The research methodology for this project was specifically designed to achieve the objectives designated by Welthungerhilfe in terms of developing baseline and strategic planning information regarding opportunities for NTFP commercialisation in the Gola area. Previous research on NTFPs in Sierra Leone has often adopted either ethnographic,⁴⁴ or at least intensive, field research⁴⁵ approaches. While such approaches undoubtedly provide very rich and nuanced data, they were not possible for this research project due to fiscal and time constraints. Therefore a research methodology broadly based on Participatory Rural Appraisal (PRA) was adopted.⁴⁶ Essentially, the PRA approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programmes. As such, it is rooted in the understanding that local (beneficiary) villages are important centres of knowledge and that the proper sourcing and utilisation of such knowledge is central to the success of any prospective project. Therefore, research practitioners are overall required to spend 'less time talking and more time listening' – directly engaging with community members in order to learn from them.

The above approach was fundamental to the first phase of the research project, which involved collecting data from eight villages in the Gola Forest / Tiwai Island region. Two researchers – Mohamed Kebbay and Sandy Massaquoi – collected primary data in these villages, spending a full day at each. While the researchers had a list of specific information and questions to be addressed, instead of going through list of questions in a survey style, they took an iterative approach involving a combination of individual and group interviews coupled with their own careful observations of different community practices. The interviews were digitally recorded to allow for later analysis (although field notes were also taken), supplemented by photographic documentation throughout the fieldwork. The specific information collected was focused on answering questions relating to the different types of NTFPs used in each community; how they are collected; what processing techniques are used; the end uses and significance of different NTFPs in the various communities and existing levels of commercialisation.

⁴⁴ i.e., Hartley, "Forest Resource Use and Subsistence in Sierra Leone."; Leach, *Rainforest relations: gender and resource use among the Mende of Gola, Sierra Leone*; Leach, "Images of propriety: the reciprocal constitution of gender and resource use in the life of a Sierra Leonean Forest Villages."

⁴⁵ i.e., Lebbie, "Distribution, Exploitation and Valuation of Non-Timber Forest Products from a Forest Reserve in Sierra Leone."; Davies and Richards, "Rain forests in Mende life: resources and subsistence strategies in rural communities around the Gola North forest reserve (Sierra Leone)."

⁴⁶ R. Chambers, *Whose Reality Counts? Putting the First Last* (London: Intermediate Technology Publications, 1997).

The second phase of the research project involved collecting NTFP data from markets in the urban centres of Kenema and Freetown. This phase of the research was more straightforward and required the identification, and then visiting, of key markets where NTFPs are sold in the two urban centres. Interviews were conducted with the NTFP vendors themselves regarding the nature and dynamics of their trade, with particular focus on the key questions of: what NTFPs are sold; their prices; their sources; and the kinds of clientele interested in purchasing them.

The final phase of the project involved a combination of online research and formal literature review to assess currently available information on NTFPs and their relevance to Sierra Leone. This included a review of existing literature on NTFPs in Sierra Leone (i.e., Section 1.3 of this report) and more general information about the challenges and opportunities in relation to commercialising NTFPs for improved livelihood and forest conservation outcomes.

2.2 Village Level NTFPs

During the research, 39 prominent non-timber forest products (NTFPs) were identified across the three main categories of foods, medicines and crafts (see Table 1). NTFPs identified as medicines were the most numerous (23 in total), with considerable variability between the different villages. Such products are generally collected throughout the year on a needs basis from local community bush and forests and, to a lesser extent, the mature forests of the National Park. Plant seeds, roots, leaves and bark are all utilised to make medicines processed by being sun dried, ground or boiled. Appendix 1 provides a full list of the of the different NTFPs found in this research collated with NTFPs identified in the Gola from other recent studies⁴⁷ – thus providing a comprehensive outline of the region's NTFPs. Below is an overview of the harvesting of more prominent NTFPs found across the region:

Dialium guineense

Dialium Guineense (known as *Mabui* in Mende, and *Blak-tombla* in Krio) was harvested as an NTFP by six of the eight communities visited. *Dialium Guineense* trees grow up to 20 metres in height and have a compact dense leafy crown. The communities visited during this research only consumed the fruit as a food product; however, other research in the Gola region has shown that the leaves and branches can be used to make a decoction that produces a medicine to treat gonorrhoea.⁴⁸ The tree produces a small berry that has red pulp and has a sweet-sour, astringent flavour. Though these berries are very popular, they can only be harvested by during the dry season (March to May). The *Dialium Guineense* trees used for harvesting are usually a couple of kilometres away from the village and are often found on the fringes of denser tropical moist forest areas. Men and children are involved in the harvesting of the berries – climbing trees and collecting a bag of berries per trip (or as many as they can carry). They usually spend around two to three hours collecting the berries. All community members (i.e., men, women and children) are then usually involved in processing the berries – this comprises of drying them in the sun for day and then storing them in a rice bag. After processing, the berries usually last about two weeks before going bad. To consume them, one peels and the berry and then sucks the seed. They are mainly consumed in the community, although there

⁴⁷ Leach, "Images of propriety: the reciprocal constitution of gender and resource use in the life of a Sierra Leonean Forest Villages."; Leach, *Rainforest relations: gender and resource use among the Mende of Gola, Sierra Leone*; Hartley, "Forest Resource Use and Subsistence in Sierra Leone."; Illes, Savill, and Koker, "Gola Forest Reserves Sierra Leone, Interim Management Plan."; Davies, *The Gola Forest Reserves, Sierra Leone: Wildlife conservation and forest Management*.

⁴⁸ C. A. MacFoy and A. M. Sama, "Medicinal plants in Pujehun district of Sierra Leone," *Journal of Ethnopharmacology* 8, no. 2 (1983).

is some minor commercial vending at local markets, where they are sold for between Le 500 and Le 1,000 per small plastic bag.

Garcinia kola

Garcinia kola (known as *Sagbei* in Mende, and *Bitu-Kola* in Krio) was reported as an actively harvested NTFP in at least four of the eight communities visited. The tree is mainly confined to the Gola Forest Area and grows to around 25 metres in high. The fruit is a yellowish-orange shaped globe, about the size of an orange.⁴⁹ Although the tree is rated 'vulnerable' by the IUCN, this rating has been predominantly based on data from Ghana, Democratic Republic of Congo and Cameroon and its conservation status in Sierra Leone is unknown.⁵⁰ The nuts from *Garcinia kola* the tree are often used for traditional medical purposes for the treatment of throat infections, stomach aches and colds. The plant is also used as a chewing stick.⁵¹ The nut of *Garcinia kola* is collected by men, women and children. Harvesting occurs during the dry season (March to May) and collectors usually travel up to three kilometres in search of the trees and spend a couple of hours collecting between 50 and 100 nuts. Processing involves placing the nuts in the sun for drying after which they are stored in a rice bag. To consume, the nut is peeled and then eaten. A couple of the communities noted that there had been a reduction in *Garcinia kola* nut availability in the past few years and blamed this on the increase in wildlife which also feeds on them. While *Garcinia kola* is consumed at the village level, many in the villages store them and carry them on trips to Kenema to make extra money (they sell for between Le 2,000 and 2,500 for 100 seeds) – no one, however, travels to Kenema just to sell the seeds but rather bring them along to sell when they are travelling for other purposes. Most villages said that they could not collect enough nuts to meet the demands of larger-scale vendors in Kenema or Freetown.

Xylopiya aethiopicia

Xylopiya aethiopicia (known as *Hawei* in Mende, and *Siminji* in Krio) was reported as being harvested as an NTFP in at least three of the eight communities visited. The tree can grow up to 20m in height and is native to the lowland rainforest and moist fringe forests in the savanna zones of Africa. The fruits and leaves of the tree are harvested to make medicines. These are harvested by men, who usually travel about three kilometres and spend three hours to harvest the tree, collecting a bag of fruit and leaves per trip. To process, the leaves and fruits are either boiled and drunk or else ground with a pestle and mortar and rubbed into the skin as an ointment. The products reportedly assist in treating coughs, stomach sickness, toothaches, boils and skin eruptions. Unfortunately, however, the product cannot be preserved for long periods. While *Xylopiya aethiopicia* is mainly used at the community level there is also some limited commercialisation and the product is sold for Le 2,500 per cup at local markets – the community noted, however, that it was not a major source of income. Apparently there was a greater demand for *Xylopiya aethiopicia* before the civil war. Although not reported by the visited communities, *Xylopiya aethiopicia* has been noted elsewhere as a popular NTFP used for its poles in housing construction and as a spice (pepper from the berries) in local cuisines.⁵² It has also been reported that there is a sizeable market for *Xylopiya aethiopicia* in Bo

⁴⁹ Savill and Fox, *Trees of Sierra Leone*.

⁵⁰ M. Cheek, "Garcinia kola," *IUCN Red List of Threatened Species*(2004).

⁵¹ M. W. Iwu, A. R. Duncan, and C. O. Okunji, "New antimicrobials of plant origin," in *Perspectives on new crops and new uses*, ed. J. Janick (Alexandria: ASHS Press, 1999).

⁵² C. Orwa et al., *Agroforestry Database: a tree reference and selection guide version 4.0* (Kenya: World Agroforestry Centre, 2009).

District, where one Guinean trader buys dried *Xylopiya aethiopyca* pods for around Le 30,000 per tin during December and January.⁵³

Piper guineense

Piper guineense (known as *Bush Pepper* in Krio) was reported as being harvested as an NTFP in three of the eight communities visited. It is a climbing vine that grows up to 20m in length and is native to tropical regions across West and Central Africa. The vine has a fruit which contains seeds which, when dried, produce a pungent flavour similar to traditional black pepper and the seeds are harvested all across West Africa.⁵⁴ In the communities visited during fieldwork, the harvesting of these seeds was exclusively conducted by men, usually within the Gola Forest National Park. It is harvested the dry season, and harvesting sessions usually take up to four or five hours. To process, the seeds are dried in the sun. They are used in cooking as well as for medicinal purposes and are also sold in local markets for between Le 3,000 and Le 3,500 per cup but commercial demand for them is quite limited at present.

Dioscorea cayenensis

Dioscorea cayenensis (known as *mbo* in Mende, and *Bush yam* in Krio) was reported as being harvested as an NTFP in six of the eight communities visited. The root of *Dioscorea cayenensis* produces an annual tuber (yam) that is around 10cm long and has a yellow flesh.⁵⁵ Although in parts other parts of West Africa (i.e., Benin and Nigeria) *Dioscorea cayenensis* has been domesticated by rural communities,⁵⁶ in Sierra Leone it is collected from the forest as a 'hunger food' during the wet season (June to November). Yams are harvested by men and youths, who usually travel two to three kilometres and spend around three hours collecting them. The tubers (yams) are simply dug up and put into a rice sack – usually around half a bag is collected at a time. To prepare, the yams are washed and boiled. Though supply has always been constant, the yams do not last long when stored and need to be collected at regular intervals when they are in demand. Interestingly, research has shown that a hot water extract made from the seed of *Xylopiya aethiopyca* (mentioned above) helps to reduce rot development in yam tubers.⁵⁷ There was no commercialisation of the yams reported in the any of the villages.

Laccosperma secundiflorum* and *Eremospatha spp

Laccosperma secundiflorum (known as *balue* in Mende, and *rattan* in Krio) and *Eremospatha spp.* (known as *kavui* in Mende, and *rattan* in Krio) were reported as being harvested as NTFPs in five of the eight communities visited. They were both identified as being good for making rope. Both are species are climbing palm (*rattan*) that grow to around 3cm in diameter and between 35 and 50 metres in length - *Eremospatha spp.* generally being the longer of the two rattans. *Laccosperma*

⁵³ Personal Communication Hans Peter Mueller, Welthungerhilfe, 6th February 2013.

⁵⁴ O. Ekundayo et al., "Essential oil constituents of Ashanti pepper (*Piper guineense*) fruits (berries)," *Journal of agricultural and food chemistry* 36, no. 5 (1988).

⁵⁵ P. Hamon and B. Toure, "The classification of the cultivated yams (*Dioscorea cayenensis-rotundata* complex) of West Africa," *Euphytica* 47, no. 3 (1990).

⁵⁶ P. Vernier, G. C. Orkwor, and A. R. Dossou, "Studies on yam domestication and farmers' practices in Benin and Nigeria," *Outlook on Agriculture* 32, no. 1 (2003); H. D. Mignouna and A. Dansi, "Yam (*Dioscorea ssp.*) domestication by the Nago and Fon ethnic groups in Benin," *Genetic Resources and Crop Evolution* 50, no. 5 (2003); R. Dumont and P. Vernier, "Domestication of yams (*Dioscorea cayenensis-rotundata*) within the Bariba ethnic group in Benin," *Outlook on Agriculture* 29, no. 2 (2000).

⁵⁷ RN Okigbo and IA Nmeka, "Control of yam tuber rot with leaf extracts of *Xylopiya aethiopyca* and *Zingiber officinale*," *African Journal of Biotechnology* 4, no. 8 (2005).

secundiflorum is found all over West and Central Africa, while *Eremospatha spp.* has a slightly more limited range and is only found in forests from Sierra Leone to Cameroon.⁵⁸ Both of these rattans are popular for use in construction and furniture making Sierra Leone, as well as across West and Central Africa.⁵⁹ These rattans are always harvested by men, who use machetes to cut the vines, usually collecting two or three bundles at a time. They are usually harvested a couple of kilometres from the villages, and the process of harvesting takes around half a day. To process, the rattan is placed in the sun to dry and then is stored in a dry place. Sometimes, before use, it is soaked in water to help it loosen. Sometimes it can be sold in local markets for between Le 8,000 and Le 10,000 per dozen; however, one community noted that commercial demand is limited and therefore the product provides only very limited income.

Aframomum melegueta

Aframomum melegueta (known as *Kponi-Gije* in Mende, and *Alligata Peppeh* in Krio) was reported as being harvested as an NTFP in four of the eight communities visited. *Aframomum melegueta* is an herbaceous perennial plant native to swampy habitats along the West African coast. It has a trumpet-shaped, purple flowers that develop into long pods containing numerous small, reddish-brown seeds. These seeds have a pungent peppery taste, and are widely used in West and North African cuisine. The seeds have also been shown to have some medicinal value.⁶⁰ The plant is harvested by all community members (men, women and the youth) and is harvested throughout the year as needed. Collectors travel up to five kilometres to harvest the *Aframomum melegueta* tree; but stated it was always in good supply. After the fruit is harvested, it is opened up and the seeds are dried in the sun to be used as a spice for food or for medicinal purposes. There was no reported commercialisation of *Aframomum melegueta* among the communities.

Pentaclethra macrophylla

Pentaclethra macrophylla, commonly known as the 'oil bean tree' (known as *Fawa* in Mende), was harvested as an NTFP by two of the eight communities visited. *Pentaclethra macrophylla* trees grow up to 21 metres in height, with a low branching habit and an open crown which allows substantial light under its canopy. The tree is found across West and Central Africa.⁶¹ The tree is harvested for both food (seed) and medicinal (bark) NTFPs. All members of the community are involved in harvesting this product, and it is harvested on a needs basis. It is always in plentiful supply and usually harvesting sessions take place over a couple of hours and within one or two kilometres of the village. The bark of the tree is used for treating worms. The bark is peeled clean and then place in

⁵⁸ K. I. Kouassi et al., "Demography and life history of two rattan species, *Eremospatha macrocarpa* and *Laccosperma secundiflorum*, in Cote d'Ivoire," *Journal of Tropical Ecology* 24, no. 5 (2008).

⁵⁹ E. Ebanyenle and A. Oteng-Amoako, "Anatomy and Identification of Five Indigeous Rattan Species of Ghana," *Ghana Journal of Forestry* 11, no. 2 (2003); E. Ebanyenle and AA Oteng-Amoako, "Variation in some anatomical and physical properties of stems of five rattan palm species of Ghana," *Journal of Bamboo and Rattan* 4, no. 2 (2005); A. Oteng-Amoako et al., "A study of the Production-toConsumption System of Rattan in Ghana," (FOREST RESEARCH INSTITUTE OF GHANA, 2000); T. Sunderland, M. B. Balinga, and M. A. Dione, "The Rattan Sector of Rio Muni, Equatorial Guinea," in *Forest Products, Livelihoods and Conservation: Case Studies of Non-Timber Forest Product Systems*, ed. T. Sunderland and O. Ndoye (Indonesia: CIFOR, 2004).

⁶⁰ C. O. Okoli et al., "Anti-Inflammatory Activity of Seed Extracts of *Aframomum melegueta*," *Journal of Herbs, Spices & Medicinal Plants* 13, no. 1 (2007); F. V. Doherty, O. O. Olaniran, and U. C. Kanife, "Antimicrobial activities of *Aframomum melegueta* (Alligator pepper)," *International Journal of Biology* 2, no. 2 (2010); G. Barnish and S. K. Samai, *Some medicinal plant recipes of the Mende, Sierra Leone* (Bo: SLADEA Publication, 1992).

⁶¹ D. O Ladipo and D. J. Boland, "Pentaclethra macrophylla: a multipurpose tree from Africa with potential for agroforestry in the tropics," *NFT Highlights* 5(1995).

water for a few hours to extract the juice. It is then drunk.⁶² The seeds, after harvesting, are roasted and then eaten, providing an important source of protein during the dry season. There was no reported commercial demand for *Pentaclethra macrophylla* among the communities.

Diospyros thomasii

Diospyros thomasii (known as a *Dukuwuli* in Mende, and *Bush Banga* in Krio) was harvested for NTFPS in two of the eight communities visited. The trees grow up to 10 metres in height and are found in forests across Guinea, Sierra Leone and Liberia. In one of the villages the fruit of the tree was harvested for food; in the other, the leaves of the tree were harvested to make a medicinal drink. In the village harvesting the fruit, trees are relatively close to the village and harvesting usually takes an hour. One bag is collected per trip. The fruit is harvested by cracking the shell and eating the nut inside. For preservation, the nut can be dried under the sun and put into a bag for storage; in this manner it can be stored for up to six months. Over the past few years the villagers had noticed a reduction in the availability of the fruit, they claimed this was a result of the Gola Forest National Park, which had caused an increase in animals in the area who also fed on the tree's fruit. In the village harvesting the tree's leaves, the distance of the trees away from the village was much greater and community members travelled up to four kilometres in search of the tree. Nevertheless, they claimed the NTFP was always readily available and they collected it on a need basis. After the leaf is harvested, it is washed and then boiled to make a medicinal tree drink, which is reportedly good for treating dysentery.⁶³ For longer term storage, the leaves can be dried in the sun and then placed in a rice of plastic bag. There was no reported commercialisation of *Diospyros thomasii*.

Nauclea latifolia

Nauclea latifolia, commonly known as African Peach (and as *Yubuiyambay* in Mende and *Brumston* in Krio), was harvested as an NTFP in five of the eight communities visited. It is a small tree that grows up to three metres in height and is found all across West Africa. The roots, leaves and bark of this tree are reportedly utilised for a large variety of different ailments, including malaria, diarrhoea, nausea, dysentery, colic and eye infections.⁶⁴ The communities surveyed during fieldwork for the present project, however, use it mainly to treat toothaches (using the root),⁶⁵ and stomach aches (using the fruit). The tree is harvested by both men and women, who usually spend a couple of hours to collect one bag of roots. The NTFP is always readily available and is collected on a needs basis. The fruit of the tree is just collected and eaten raw. The roots are dug up, washed, have their bark scraped off, cut into small pieces and mixed with water to make a medicinal drink. Both the root and fruit can be dried in the sun and put in a plastic bag for longer-term storage. There was no commercial demand for *Nauclea latifolia* reported among the communities.

⁶² Barnish and Samai, *Some medicinal plant recipes of the Mende, Sierra Leone*.

⁶³ Lebbie and Guries, "Ethnobotanical value and conservation of sacred groves of the Kpaa Mende in Sierra Leone."; Barnish and Samai, *Some medicinal plant recipes of the Mende, Sierra Leone*.

⁶⁴ Lebbie and Guries, "Ethnobotanical value and conservation of sacred groves of the Kpaa Mende in Sierra Leone."; Barnish and Samai, *Some medicinal plant recipes of the Mende, Sierra Leone*; MacFoy and Sama, "Medicinal plants in Pujehun district of Sierra Leone."; E. S. Ayensu, *Medicinal Plants of West Africa* (Algonac: Reference Publications, 1978).

⁶⁵ This was also reported as a use in: Lebbie and Guries, "Ethnobotanical value and conservation of sacred groves of the Kpaa Mende in Sierra Leone."

Beilschmiedia mannii

Beilschmiedia mannii (known as *Gba* in Mende, and *Tola* in Krio) was reported as being harvested as an NTFP in three of the eight communities visited. The tree can grow as high as 35m and is found in the rainforest, especially in slightly swampy areas. It is present across West and Central Africa, and the seed from *Beilschmiedia mannii* fruit is commonly sold in West African markets as a condiment to enrichment to soups, rice and vegetables.⁶⁶ In the Gola Forest area it is harvested during the dry season. All members of the community are involved in the harvesting, which involves the collecting of seeds that have fallen onto the forest floor. The seeds are then dried and ground with a mortar and pestle. Sometimes the unground seeds are stored in rice bags for future use. During the dry season, local markets sometimes sell these seeds for between Le 4,000 and Le 5,000 a cup.

Heritiera utilis

Heritiera utilis (known as *Yawii* in Mende and *Hamon* in Krio), was harvested as an NTFP by two of the eight communities visited. The tree grows up to 30 metres in height and is found only in coastal West Africa. This tree species, particularly during the 1950s and 1960s, was popular in Sierra Leone for commercial sawmilling and was commonly (and still is) sown in plantations across the country.⁶⁷ Some of the communities noted that Welthungerhilfe had given them *Heritiera utilis* seedlings to plant. Although its conservation status is rated as 'vulnerable' by the IUCN⁶⁸ there have been no real studies of its distribution and abundance in Sierra Leone.⁶⁹ The bark of the tree is often harvested to treat diarrhoea and dysentery-related ailments. In Ghana, the leaves from the tree are also often used as a treatment for Kwashiorkor.⁷⁰ In the surveyed villages, harvesting of the tree is conducted by men and women both, travelling only short distances (less than one kilometre) and for short periods of time (less than an hour) to secure supplies. It is harvested on a needs basis, with generally one rice bag harvested per trip. To process, the bark is boiled in water, which is then drunk. There was no reported commercialisation of this NTFP among the communities.

Cassia Siamea* and *Cassia Sieberiana

*Cassia Siamea*⁷¹ (known as *Sheku Turay* in Mende) and *Cassia Sieberiana* (known as *Gbangbei* in Mende) are harvested as an NTFP in three of the eight communities visited. Both trees are exotic species that have been introduced into Sierra Leone from Burma. *Cassia Siamea* was introduced in the 1920s by the Forestry Department⁷² while *Cassia Sieberiana* was introduced much more recently, likely in the 1980s, and has been commonly used in tree planting programs in the Gola region.⁷³ The trees are native across South and South-East Asia, and grow up to 18 metres in height. The roots of both the trees are commonly harvested to make a medicine to treat malaria but they

⁶⁶ N. Nyunaï, "Beilschmiedia mannii," in *Timbers 1*, ed. D. Louppe, A. A. Oteng-Amoako, and M. Brink (Wageningen: PROTA, 2008).

⁶⁷ I. G. Bulmer, "Report on the Forest Administration of Sierra Leone 1959/1960," (Freetown: Government Printer, 1960).

⁶⁸ IUCN, "IUCN Red List of Threatened Species.," www.iucnredlist.org.

⁶⁹ Interestingly, the Flora and Fauna Liberia website describes it as being a very common tree in Liberia.

⁷⁰ P. Addo-Fordjour et al., "Diversity and conservation of medicinal plants in the Bomaa community of the Brong Ahafo region, Ghana," *Journal of Medicinal Plants Research* 2(2008).

⁷¹ It is more commonly known as *Senna Siamea* around the world, however, in Sierra Leone the name *Cassia Siamea* is more common.

⁷² E. MacDonald, "Sierra Leone Annual Report of the Forest Department for the Year 1930," (Freetown: Government Printer, 1931).

⁷³ P. D. Cummings, "Community Forestry - Prospects For Sierra Leone" (University of Bangor, 1990).

can also be used to make laxative medicines when mixed with other NTFPs.⁷⁴ Both trees are harvested and processed in the same manner. The NTFP is harvested by both male and female members of the community on a needs basis, and is reportedly always in good supply. Harvesting usually takes around an hour, and one bag of roots is collected per trip. The roots are dug up, their bark is removed, and they are then washed and cut into smaller pieces. These pieces are then mixed with water to make a medicinal drink. The roots can also be dried in the sun to ensure their longer-term preservation. There was no reported commercial demand for either tree among the communities.

Morinda geminata

Morinda geminata (known as *Njasui* in Mende) was harvested as an NTFP by one of the eight communities visited.⁷⁵ The tree grows up to 10 metres tall and is most commonly found in secondary forest and farm fallow areas. The leaves of the tree are used to treat stomach pain and MacFoy, in his study on NTFPs in Pujehun, also noted that some communities use the roots of the tree in a similar manner to *Cassia siamea*.⁷⁶ An early study in Sierra Leone noted that this tree was often planted near houses in Sierra Leone.⁷⁷ The tree is harvested by both men and women, and is usually found within two kilometres of the village. To process, the leaf is simply boiled in water to make a medicinal tea. For storage, it can be dried in the sun and stowed in a plastic bag. There was no reported commercial demand for *Morinda geminata* among the communities.

Bussea occidentalis

Bussea occidentalis (known as *Helei* in Mende) was harvested as an NTFP by five of the eight communities visited. *Bussea occidentalis* trees grow up to 45 metres in height, have a small dense crown and tend to be found in damper areas. The tree is found across West Africa, from Sierra Leone to Ghana.⁷⁸ The fruit of the tree is used for food and medicine. Known commonly as oilbean seed, the fruit is reportedly effective in treating jaundice and sleeping sickness⁷⁹ but in the Sierra Leonean context it is more commonly used as a sweet and oily additive for food dishes. The trees are harvested in March usually within two to three kilometres from the village. Everyone (men, women, children) is involved in harvesting the fruits, which are collected from the forest floor under the trees and harvesting can take up to a whole day. Supply can sometimes be limited as animals, in particular Colobus Monkeys,⁸⁰ also like to feed on the fruits. For processing, the fruits are either dried in the sun whole or ground down with a pestle and mortar and then dried. It is then stored in a bag and hung to prevent fungal infection. Commercial demand for the fruit is low, but when there is demand it can be sold for between Le 3,000 and Le 4,000 per cup.

⁷⁴ N. M. Krüger, "Beobachtungen zur traditionellen Medizin der Mende in Sierra Leone," *Curare* 3(1985); MacFoy and Sama, "Medicinal plants in Pujehun district of Sierra Leone." Lebbie and Guries, "Ethnobotanical value and conservation of sacred groves of the Kpaa Mende in Sierra Leone."

⁷⁵ Cummings, "Community Forestry - Prospects For Sierra Leone."

⁷⁶ MacFoy and Sama, "Medicinal plants in Pujehun district of Sierra Leone."

⁷⁷ J. M. Dalziel, *The useful plants of West Tropical Africa* (London: Crown Agents for the Colonies, 1937).

⁷⁸ M. Holmegren et al., "Ecological Profiles of Rare and Endemic Species," in *Biodiversity of West African Forests - An Ecological Atlas of Woody Plant Species*, ed. L. Poorter, et al. (Oxon: CABI Publications, 2004).

⁷⁹ F. Freiburghaus et al., "Evaluation of African medicinal plants for their in vitro trypanocidal activity," *Journal of Ethnopharmacology* 55, no. 1 (1996); K. Oje and E. C. Ugbor, "Some physical properties of oilbean seed," *Journal of Agricultural Engineering Research* 50(1991); F. B. Magassouba et al., "Ethnobotanical survey and antibacterial activity of some plants used in Guinean traditional medicine," *Journal of Ethnopharmacology* 114, no. 1 (2007).

⁸⁰ Holmegren et al., "Ecological Profiles of Rare and Endemic Species."

Carapa Procera

Carapa procera, known commonly as African Crabwood (known as *Kowe* in Mende and *Kundi* in Krio), is harvested as an NTFP in five of the eight communities visited. *Carapa procera* trees grow up to 25 metres in height, and are generally found in swampy forest areas. The tree is found across Africa, Asia, Latin America and Oceania.⁸¹ The bark of the tree is harvested by Gola communities and is used to make medicine to treat fevers. In other parts of West Africa it is also apparently used to dress sores and for antimalarial purposes.⁸² The tree is harvested when needed throughout the year and there were no reported issues with supply. Harvesting is only conducted by men, who travel two to three kilometres in search of the tree. Harvesting occurs in both the National Park and areas of secondary forest outside the park. To process, the bark is sliced and put in the sun to dry. It is then stored in a rice bag or other plastic bag. To consume, it is mixed with boiling water and drunk. In a couple of communities it was also chewed raw. There was no commercial demand for *Carapa procera* report among the communities.

Honey

Honey was harvested as an NTFP by five of the eight communities visited. It was the only non-plant NTFP observed during the research. Honey is usually harvested over a three to six hour period and it is predominantly men that are involved in the process. To collect the honey, they usually cut down the tree and use fire to kill the bees and then remove the honey combs by hand, placing them in a container. The combs are then boiled or squeezed to extract the honey, which is then stored in plastic containers. All the communities state that they were experiencing a low supply of honey and that demand was largely outstripping supply. They claimed that the scarcity was due to the cutting down of the large trees that bees tended to make their hives in. When it is available, honey is the most lucrative of the NTFPs, with constant demand in Freetown and other large towns across the country. It sells for between Le 3,000 and Le 6,000 per pint.

2.3 NTFPs in Urban Markets

The trade in NTFPs in the markets of Kenema and Freetown was found to be surprising limited. Although there is some small-scale trade, mainly in medicinal NTFPs, most proprietors stated that there is low demand for NTFPs, which are therefore not very profitable. The only product that was widely available across the urban markets was *Bitter Cola* (*Garcinia kola*). Vendors in Kenema pay between Le 2,000 and 2,500 for 100 seeds, while one Indian vendor in Freetown purchases them for Le 12,000 per kilogram. Interestingly, whereas Kenema vendors sell Bitter Cola in nut form as a male aphrodisiac, the Freetown vendors use the nut to produce Bitter Kola Energy drinks. Vendors reported that supply is always an issue, as the nut is usually harvested between September and November, and the main vendor in Freetown actually sources most of his *Bitter Cola* from Ghana, importing four to five tonnes at a time.⁸³ This implies that, for Bitter Cola at least, there could be a solid market for producers from the Gola area.

⁸¹ Ibid.

⁸² B. E. P. Oliver-Bever, *Medicinal plants in tropical West Africa* (Cambridge: Cambridge University Press, 1986).

⁸³ The Freetown vendor's contact details are: is Kadco Enterprise, Waman Abu Compound, Baibureh Road, Freetown; Phone: 033/076/077 144007.

3. Conclusions

It is evident from the research that NTFPs provide important medicines, nutrients and construction resources for the communities in the Gola Forest region. At the same time, however, it is also clear that trade in NTFPs is extremely limited, for reasons which present considerable challenges to any future initiative to improve livelihoods and forest conservation through NTFP commercialisation in the area. Essentially, major NTFP trade is currently held back by the ‘tyranny of distance,’ as Kenema and Freetown (the two most promising potential domestic markets for Gola’s NTFPs) thus far have relatively limited NTFP markets that are already largely satisfied by NTFP supplies from the geographically adjacent Kambui Hills and Western Area Peninsula forest reserves. Given the high (and often fluctuating) cost of transportation in Sierra Leone along with the low domestic profit margins of NTFPs, attempts to commercialise Gola NTFPs through these avenues would likely fail.

This does not mean that Gola region NTFPs cannot be commercialised, but rather that creative approaches will be required, such as targeting or cultivating specific niche markets. One notable opportunity is with Bitter Cola (from the *Garcinia kola* tree). If supply from the villages around the Gola Forest could be boosted to reach a sufficient economy of scale and regulated to ensure an adequate quality level, they could collectively become an attractive supplier to the company producing the Bitter Cola Energy Drink in Freetown. As well, it is important to consider that the greatest strength of these NTFPs may not be their physical qualities or uniqueness, but rather the opportunities for branding afforded by their socio-political and ecological location. The Gola Forest National Park and Tiwai Island Wildlife Sanctuary are both well-recognised names in Sierra Leone, especially among the relatively large expatriate community. This community also has very high purchasing power – generally earning salaries higher than the mean even in their own countries – and arguably also high environmental awareness and a propensity to support worthy environmental causes. This is certainly a market that could be developed (as recent innovative private sector initiatives have demonstrated) for specific Gola NTFPs. How such niche markets can be exploited is discussed in the recommendations below.

4. Recommendations

4.1 Establishment of an NTFP Gola Business

In general, individual Gola forest communities lack the economies of scale, market knowledge, and business skills to be able to be able make substantial profits from NTFP commercialisation. While the NGOs involved in the Gola region can initially participate in promoting the trade, in the longer-term there will be a need to establish a business to ensure the long term sustainability of the trade. This business will need to organise logistics (i.e., sourcing the products from Gola), packaging, marketing and sales of the products. It will also need a centralised depot for storing NTFPs and to act as a centralised representative and marketing hub for the commercialisation of the products. The most obvious place for this depot would be at Potoru because: a) it is centrally located and reasonably close to the target villages; b) it is on the main highway between Liberia and Sierra Leone, and therefore has relatively good transport connections to the major urban markets of Freetown, Monrovia, Bo and Kenema; and c) EFA currently has an office there and therefore could play a part in overseeing the operations (the office itself could even potentially house the depot).

The depot at Potoru would subsequently act as a hub where Gola Villages could sell their relevant NTFPs and it would then organise the transfer, marketing and selling these NTFPs to the main markets in Sierra Leone, Liberia and overseas. This would mean that nuanced marketing skills would

only need to be developed for a small core group of the staff in Potoru, while villages would only be required to harvest and organise the transportation of their NTFPs to the depot. The depot would purchase NTFPs and then would sell them on to different markets with an increased profit margin to ensure the business is financially viable.

4.2 Recruit a Marketing Expert

To facilitate the commercialisation of the NTFPs, one of the organisations in the program (i.e., EFA, CSSL, GFP, RSPB, or WHH) should hire someone with a professional background in marketing. A good source for recruiting domestically could be recent graduates from the Institute of Public Administration and Management (IPAM) in Freetown. It would be a strategic move, initially at least, to hire internationally as well, given that target markets will have an international dimension. A potential avenue for sourcing such an individual could be through the Peace Corp or Volunteers Service Overseas (VSO) programs,⁸⁴ whereby an organisation can find an individual with a relatively substantial professional experience while only needing to pay a local stipend. As is the norm with these organisations, such an expatriate should be teamed up with relevantly skilled Sierra Leoneans during their tenure to ensure relevant skills are traded and embedded locally in Sierra Leone. The longer term objective would be to have a local 'marketing expert' employed by the Gola NTFP business. Essential to the success of commercialising NTFPs, is to employ somebody that knows how to effectively find and exploit relevant markets.

4.3 Employ and Train more Forest Researchers

The Gola program has produced some excellent research in recent (and historical) times; however, the vast majority has been grounded in the natural sciences. Given that many of the key challenges faced by the park relate primarily to socioeconomic dynamics in – and socio-political conflicts with – surrounding communities, if desired conservation outcomes are to be realised there needs to be a much more dedicated program of social science research. While this project has provided a reasonable snapshot of the use of NTFPs, there needs to be a more consistent program of social science data collection in Gola forest communities. We would therefore recommend that the Gola Forest Program employ at least one (but preferably two) social researchers, whose main task would be to collect and analyse data from these communities. As social science research training is quite underdeveloped in Sierra Leone, it may be strategic to send one or two staff to attend relevant overseas postgraduate courses, for which there are many funding opportunities available.⁸⁵

4.4 Three Pilot NTFP Commercialisation Projects

Pilot Project 1. Nuts for Kola

NTFP Product:

Garcinia kola (Bitter Kola)

Part of Plant Used:

Nut

⁸⁴ Hiring someone from one of these organisation would also provide immediate to a large section of the expatriate. Each of the organisations has around 80 volunteers in country.

⁸⁵ Notably, the Australian Government has recently expanded its scholar opportunities for Africa candidates wishing to attend postgraduate course in Africa: <http://www.adsafrica.com.au/>

Target Market:

Bitter Kola Makers (Domestic Urban Market)

Background:

Garcinia kola is arguably one of the most important commercialised non-timber forest products in West Africa, with major trade of the product occurring in Nigeria, Cote d'Ivoire and Ghana.⁸⁶ In Sierra Leone, an important domestic market for *Garcinia kola* exists, and out of the targeted villages it was the most likely NTFP to be traded commercially as many villagers already sold the nuts in Kenema. Although, this was a source of occasional income rather than a regular livelihood source, there is evidence of great demand for the nut, with the producers of the Bitter Kola Energy Drink (Kadco Enterprise) importing *Garcinia kola* nuts from Ghana in order to fill their demand.

Marketing Strategy:

The NTFP business should organise a meeting with the Kadco Enterprise – the producers of the Bitter Kola Energy Drink - to develop a potential terms of agreement for the supply of *Garcinia kola* nuts. The NTFP would then be in charge of sourcing *Garcinia kola* nuts from the Gola villages and then transporting/selling them to Kadco Enterprise on a regular basis.

Pilot Project 2. Peppers for expats**NTFP Products:**

Fromomum melegueta (Alligator Pepper)

Xylopiya aethiopicum (Guinea Pepper)

Piper guineense (Ashanti Pepper)

Part of Plant Used:

Fruit

Target Market:

Expatriate community in Sierra Leone

Background:

Interestingly, all of the three peppers above - *Fromomum melegueta*, *Xylopiya aethiopicum*, *Piper guineense* – were traded with Europe many years ago. *Piper guineense*, often referred to as 'Ashanti Pepper,' was exported to Europe during the 16th century and in fact, the first British voyage to the Guinea coast (in 1553) reportedly had the goal of sourcing this spice.⁸⁷ *Fromomum melegueta* – often known as alligator pepper – was traded across the Saharan desert via caravan routes, being sold as far as Sicily and Italy as early as 2,000 years ago. In the 14th and 15th centuries it became especially popularly as a substitute for black pepper in Europe, and was known as the "grains of paradise."⁸⁸ *Xylopiya aethiopicum*, popularly known as 'Guinea Pepper' was also exported to Europe during the Middle-Ages.⁸⁹ The trade in these peppers, however, has since dissipated and has largely

⁸⁶ A.A. Adebisi, "A case study of *Garcinia kola* nut production-to-consumption system in J4 area of Omo forest reserve, South-west Nigeria," *Forest products, livelihoods and conservation. Case studies of non-timber forest product systems* 2(2004); Spore, "Kola Nut: More than just a symbol 20," 157(2012).

⁸⁷ A. Dalby, *Dangerous Tastes: The Story of Spices* (Berkeley: University of California Press, 2000).

⁸⁸ A. M. Van Harten, "Melegueta pepper," *Economic botany* 24, no. 2 (1970); J. M. Lock, J. B. Hall, and D. K. Abbiw, "The Cultivation of Melegueta Pepper," *Economic botany* 31, no. 3 (1977).

⁸⁹ B. Pickergill, "Spices," in *The Cultural History of Plants*, ed. G. Prance and M. Nesbitt (New York: Routledge, 2005).

been neglected by European markets. Given the interesting history, and the previous widespread consumption, of these spices, there certainly could be good opportunities for their remarketing and trade.

Marketing Strategy:

The ideal initial target market for these products would be the expatriate community in Freetown. If this effort is successful, promotion of the products could then potentially be expanded to international markets. The expatriate population can be divided into three broad categories: 1) aid/development professionals, which includes short- and long-term volunteers and long term professionals; 2) private sector workers – the largest segment being in the mining sector; and 3) tourists, the smallest group, but one that is rapidly growing.

An import aspect of targeting this market will be in the packaging and the promotion of the peppers. The products can be used as a substitute for ‘black pepper,’ a common household item; however, for them to be successfully marketed, they need to develop a competitive advantage as product. Therefore, they should be promoted as ‘Gola Peppers,’ and promoted as products that assist in forest conservation and poverty alleviation in the Gola Forest region. Furthermore, a short narrative of their historical trade and use in Europe and their use in cooking on the packaging would also be useful into transforming it into a niche (and therefore a premium priced) product.

One of the best ways to target the expatriate market is through ‘virtual space.’ There are a number of online social media that the demographic frequents and use for communication and several innovative businesses in Sierra Leone have already started to utilise these media to promote their products to the broader expatriate community in Freetown. These include facebook and twitter groups, as well as online forums such as SaloneFAB (through Google) and Freetown Announce (through Yahoo). Freetown announce, which was established in 2009, is perhaps most prominent of these groups with 730 members at the time of writing.

In terms of physical marketing spaces, products could initially be sold through existing retailers in Freetown. The most obvious would be the supermarkets (e.g. along Wilkinson road) that the expatriate community frequent, as these supermarkets are already starting to stock and sell more and more locally produced products. There are also certain hospitality businesses in Freetown (e.g., Crown Bakery, Bliss, Alex’s, etc.) that allow outside organisations to hold events and sell items (generally for charitable reasons) and it would certainly be beneficial to start exploring potential partnerships with them. Finally, there are the hotels, and an obvious first step would be to try and supply them with “Gola Peppers.”

3. Natural Dye for Clothes

NTFP Products:

Garcinia kola

Harungana Madagascariensis

Baphia nitida

Part of Plant Used:

Bark (*Harungana Madagascariensis*)

Nuts (*Garcinia kola*)

Bark, Leaves (*Baphia nitida*)

Target Market:

International Market

Background:

Natural dyes are dyes or colorants derived from plants, invertebrates, or minerals. For thousands of years such dyes have been used for colouring clothing and textiles around the world. The invention of synthetic dyes during the 19th century caused a long decline in the large-scale natural dye market. Synthetic dyes, which could easily be produced in large quantities, quickly replaced natural dyes for the commercial textile production that was enabled by the industrial revolution, and unlike natural dyes, these new dyes were suitable for the synthetic fibres that followed. In the past decade, however, the market for natural dyes in the fashion industry has been experiencing a resurgence. The growth 'environmental awareness,' in Europe in particular, has seen increase consumer demand for natural dyes – as synthetic dye production is a highly polluting activity. A number of European governments have even place bans on certain types of synthetic dyes.⁹⁰

Sierra Leone has a long history of using natural dyes, with indigo dye being particularly prominent, especially among the Madinka ethnic group. One the earliest exports from Sierra Leone to Europe was Camwood (*Baphia nitida*), which was used for making red dyes. However, since the arrival of synthetic dyes since the mid-1960s, the trade and use of natural dyes has subsided.⁹¹ Given the recent changes in Europe that have helped to create a more amicable market for natural dyes, now is an optimal time to explore potential dye export opportunities from Sierra Leone.

Marketing Strategy:

Three initial tree species have been selected to trial for making natural dye; however, there are many more potential tree species which could be utilised in future.⁹² The bark from *Harungana madagascariensis*, a tree species that is popularly harvested for making building poles, produces a yellow dye. The nuts of *Garcinia kola*, discussed above in relation to Bitter Cola, produce an orange die. Finally, the bark of *Baphia nitida*, from the pre-colonial traded tree 'Camwood,' produces a red dye. The preparation of the dyes is a straightforward process. For bark, the outer layers (the epidermis) should be removed, and the inner layers should be broken into small pieces dried in the shade for a few days. Then they should be pounded with a pestle and mortar to break down the fibres. Nuts need to go through the same process; however, they do not require the removal of their outer layers.⁹³

These dyes can then be marketed and sold to natural dye wholesalers in Europe and North America.⁹⁴ RSPB and WHH could also use their significant presence in Europe to help facilitate the promotion of such products. It should be noted, however, that the logistics of supply and the quality requirements of these products will be the most difficult of the three options discussed here and should be organised with each potential buyer on a one-to-one basis.

⁹⁰ S. IshratAli, "Revival of natural dyes in Asia," *Journal of the Society of Dyers and Colourists* 109, no. 1 (2008); D. J. Hill, "Is there a future for natural dyes?," *Review of Progress in Coloration and Related Topics* 27, no. 1 (1997).

⁹¹ C. A. MacFoy, "Ethonobotany and sustainable utilization of natural dye plants in Sierra Leone," *Economic botany* 58(2004); M. Wahlman and E. Chuta, "Sierra Leone resist-dyed textiles," in *The Fabrics of Culture: the anthropology of clothing and adornment*, ed. J. M. Cordwell (Mouton Publishers, 1979).

⁹² MacFoy gives a good overview of these: MacFoy, "Ethonobotany and sustainable utilization of natural dye plants in Sierra Leone."

⁹³ Ibid.

⁹⁴ A list of potential buyers can be found here: <http://www.naturaldyes.org/sources.htm>

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Appendix A – List of Non-Timber Forest Products found in the Gola area

The information for this list was gathered *in situ* during this research project as well as from existing studies on NTFP's in the Gola Forest: see A. G. Davies, and P. Richards' (1991) report: "Rain Forests in Mende Life: Resources and Subsistence Strategies in Rural Communities around the Gola North Forest Reserve (Sierra Leone)."; D Hartley's (1992) PhD Thesis: *Forest Resource Use and Subsistence in Sierra Leone*; Melissa Leach's (1990) PhD Thesis: *Images of Propriety: The Reciprocal Constitution of Gender and Resource Use in the Life of a Sierra Leonean Forest Villages*; Cyrus MacFoy and Albert Sama's (1990) article "Medicinal Plants in Pujehun District of Sierra Leone; and Aiah Lebbie and Raymond Guries' (1995) article "Ethnobotanical Value and Conseration of Scared Groves of the Kpaa Mende in Sierra Leone." The NTFPs are broken down into four categoris: Household Items (e.g., baskets, pestles, mortars, etc.); Construction Items (e.g., poles, thatching, etc.); Food items; and Medicines.

Tree Nomenclature			Use			
Botanical Name	Mende vernacular	Krio vernacular	Household Utensil	Food	Medicine	Construction
<i>Acacia pennata</i>	<i>tanye</i>				x	
<i>Acanthus montanus</i>	<i>Kpete pela</i>				x	
<i>Acioa scabrifolia</i>	<i>nyegalae</i>				x	
<i>Adenia lobata</i>	<i>mawoni</i>		x		x	
<i>Aframomum melegueta</i>	<i>Kponi-Gije</i>	<i>Aligator Pepper</i>		x	x	
<i>Azelia africana</i>	<i>KpEndEi</i>	<i>Konta</i>	x			X
<i>Ageratum conyzoides</i>	<i>Yarnigbei</i>				x	
<i>Albizia adiathiofolia</i>	<i>Kpakpei</i>					X
<i>Albizia zygia</i>	<i>Kpakpei</i>			x	x	X
<i>Alchornea cordifolia</i>	<i>nJekoei</i>			x	x	
<i>Alchornia hirtella</i>	<i>tokenge</i>				x	
<i>Alstonia boonei</i>	<i>Kalo-wuli</i>				x	
<i>Alternanthera sessilis</i>	<i>nDatawuli</i>				x	
<i>Amaralia heinsiodies</i>	<i>GramatEtEi</i>				x	

<i>Amaranthus spp.</i>				x		
<i>Amphimas pterocarpoides</i>			x		x	X
<i>Ancistrophyllum secundiflorum</i>			x			
<i>Anisophyllea laurina</i>	<i>Kandii</i>	<i>Maki-apul</i>	x	x	x	X
<i>Anthocleista noblis</i>	<i>Pongoi</i>				x	
<i>Anthonotha macrophylla</i>	<i>Mbombii</i>				x	
<i>Antiaris africana</i>	<i>Vawii</i>		x			
<i>Bambusa vulgaris</i>				x		X
<i>Baphia nitida</i>	<i>Bundui</i>		x			X
<i>Beilschmiedia mannii</i>	<i>Gba</i>	<i>Tola</i>		x	x	
<i>Blighia spp.</i>	<i>yokomei</i>	<i>Dai-dai</i>	x			X
<i>Bridelia micrantha</i>	<i>Kui</i>				x	X
<i>Bryophyllum pinnatum</i>	<i>kPolaa</i>				x	
<i>Bussea occidentalis</i>	<i>Helei</i>			x		X
<i>Cajanus cajan</i>	<i>Congo Binch</i>				x	
<i>Calamus deeretus</i>			x			
<i>Caloncoba echinata</i>	<i>Goli</i>				x	
<i>Canthium glabrifolium</i>	<i>mBEli wa-waa</i>				x	
<i>Carapa procera</i>	<i>Kowei</i>	<i>Kundi</i>			x	X
<i>Carica papaya</i>	<i>Fakai</i>				x	
<i>Cassia alata</i>	<i>nJepaa</i>				x	
<i>Cassia Siamea</i>	<i>Sheku Turay</i>	<i>Sheku Turay</i>			x	
<i>Cassia Sieberiana</i>	<i>Gbangbei</i>				x	
<i>Catharanthus roseus</i>	<i>flawah</i>				x	
<i>Ceratotheca spp.</i>				x		
<i>Cercestis afzelii</i>	<i>nBEmbEi</i>		x			X
<i>Chrysophyllum pruniforme</i>	<i>TËyEi</i>			x		X
<i>Citrus aurantifolia</i>	<i>Lumbe-nyËnyË</i>				x	
<i>Cleistopholis patens</i>	<i>Mɔigbamei</i>				x	
<i>Clerodendron scandens</i>	<i>hona wuli</i>				x	
<i>Cnestis ferruginea</i>	<i>Nyamaiwai</i>				x	
<i>Coelocaryon spp.</i>	<i>Kpei</i>			x		
<i>Coffee robusta</i>			x	x		
<i>Cola caricaefolia</i>			x			
<i>Cola lateritia</i>	<i>Bunei</i>			x		
<i>Cola nitida</i>	<i>Tolei</i>	<i>Kola</i>		x	x	

<i>Colocasia esculenta</i>						X
<i>Combretum smeathmanii</i>	<i>hapkpa nyamui</i>				x	
<i>Costus afer</i>	<i>Hɔwoi</i>				x	
<i>Crassocephalum rubens</i>	<i>kikpoi</i>		x		x	
<i>Craterispermum laurinum</i>	<i>nyelae</i>				x	X
<i>Crossandra buntingii</i>	<i>Komafali</i>				x	
<i>Cynometra leonensis</i>	<i>Kpavii</i>		x			
<i>Daniellia thurifera</i>	<i>GbEsEi</i>	<i>Bungbo</i>	x			
<i>Datura metel</i>	<i>Jao-gojie</i>				x	
<i>Desmodium adscendens</i>	<i>nDɔgbɔ - nikii</i>				x	
<i>Detarium senegalense</i>	<i>Gbuyai</i>	<i>Dita</i>	x			
<i>Diallum guineese</i>	<i>Mamboi</i>	<i>Blak-tombla</i>		x		X
<i>Dichrostachys glomerata</i>	<i>Ndandei</i>		x		x	X
<i>Dichrostachys cinera</i>			x		x	X
<i>Dioscorea cayensis</i>	<i>Mbo</i>	<i>Bush yam</i>		x		
<i>Dioscorea cayensis</i>	<i>Didi</i>			x	x	
<i>Diospyros heudelotti</i>	<i>Dukuwuli</i>	<i>Bush Banga</i>	x	x	x	X
<i>Diospyros thomasi</i>	<i>Dukuwuli</i>	<i>Bush Banga</i>			x	
<i>Dissotis rotundifolia</i>	<i>nGaku-wui</i>				x	
<i>Dryopteris striata</i>	<i>koye</i>				x	
<i>Elaeis guineensis</i>	<i>Tɔkpɔi</i>		x	x	x	X
<i>Elesuine indica</i>	<i>ngetae wuli</i>				x	
<i>Enantia polycarpa</i>	<i>Belo-hinei</i>				x	X
<i>Entada pursaetha</i>			x			X
<i>Entandrophragma spp.</i>	<i>Jelei</i>					X
<i>Eremospatha hookeri</i>			x			X
<i>Eremospatha macrocarpa</i>			x			X
<i>Eremospatha spp.</i>	<i>Balue</i>	<i>Ratten</i>	x			X
<i>Erythrophleum ivorense</i>	<i>NgogbEi</i>		x			X
<i>Fagara leprieri</i>	<i>So-wuli</i>				x	
<i>Fagara macrophylla</i>	<i>fui</i>				x	
<i>Ficus capensis</i>	<i>nDahie</i>				x	
<i>Ficus exasperata</i>	<i>Kamaamai</i>				x	
<i>Funtumia africana</i>	<i>Boboi</i>		x			
<i>Funtumia elastic</i>	<i>Boboi</i>		x			X
<i>Garcinia kola</i>	<i>Sagbei</i>	<i>Bitu-Kola</i>	x	x	x	

<i>Glyphaea brevis</i>	<i>Gbagbolei</i>				x	
<i>Gmelina arborea</i>	<i>Yemane</i>	<i>Yemane</i>	x		x	
<i>Gouania longipetala</i>	<i>Sawai wai</i>				x	
<i>Habropetalum dawei</i>					x	X
<i>Hannoa klaineana</i>	<i>Bovui</i>		x			
<i>Harungana floribunda</i>					x	
<i>Harungana madagascariensis</i>	<i>Yogoi</i>	<i>Blɔd-tri</i>	x		x	X
<i>Hisbiscus esculentus</i>	<i>Bɔndeɪ</i>				x	
<i>Hisbiscus sterculiifolious</i>	<i>Kowei</i>		x		x	
<i>Holarrhena floribunda</i>	<i>Nukui</i>		x		x	X
<i>Hymenocardia lyrata</i>	<i>Fagbanjui</i>				x	X
<i>Ipomoea involucrata</i>	<i>nDondokoei</i>				x	
<i>Irvingia gabonensis</i>	<i>Bɔbɔi</i>			x		X
<i>Jatropha curcas</i>	<i>kata wuli</i>				x	
<i>Kaoue stapfiana</i>	<i>Nguin</i>					X
<i>Laccosperma secundiflorum</i>	<i>Kavui</i>	<i>Ratten</i>	x		x	X
<i>Lagenaria siceraria</i>			x			
<i>Landolphia spp.</i>				x		
<i>Leconodiscus cupanioides</i>	<i>Kafei</i>				x	X
<i>Lonchocarpus cyanensis</i>			x			
<i>Lophira alata</i>	<i>Hendui</i>		x			
<i>Macaranga barteri</i>	<i>Ndɛwɛi-gbɔi</i>				x	X
<i>Macaranga heudelotti</i>	<i>Ndɛwɛi-Guee</i>				x	X
<i>Manifera indica</i>	<i>mangoi</i>			x	x	
<i>Manniophyton fulvum</i>	<i>nJolei</i>				x	X
<i>Marantochloa cuspidata</i>						X
<i>Mareya micrantha</i>	<i>Nwanwai</i>	<i>Nɔmba-wan</i>	x		x	X
<i>Margaritaria discoidea</i>	<i>Tijoi</i>		x			X
<i>Microdesmis puberula</i>	<i>Nikilii</i>		x		x	X
<i>Microglossa vulubilis</i>	<i>Grimbo yufii</i>				x	
<i>Milicia regia</i>	<i>Semei</i>	<i>Iroko</i>	x			X
<i>Millettia rhodantha</i>	<i>torlu gbele</i>		x		x	X
<i>Mimosa pudica</i>	<i>gBagbɛ mi</i>				x	
<i>Mitragyna stipulosa</i>	<i>Bɔɛi</i>	<i>Agidi-lif</i>			x	X
<i>Morinda geminata</i>	<i>Njasui</i>				x	X
<i>Morinda morindiodes</i>	<i>kojo logbo</i>				x	
<i>Musa cavendishii</i>	<i>manawa</i>		x		x	X

<i>Musanga cecropioides</i>	<i>Govui</i>		x		x	X
<i>Myrianthus serratus</i>	<i>Fɔfɔi</i>		x		x	X
<i>Napoleona heudelotii</i>	<i>ngolo haemi</i>					
<i>Nauclea diderrichii</i>	<i>Bundui</i>	<i>Brumston</i>	x	x	x	
<i>Nauclea latifolia</i>	<i>Yubuiyambay</i>	<i>Brumston</i>		x	x	
<i>Neuropeltis spp.</i>						X
<i>Nymphaea spp.</i>	<i>pupendae</i>				x	
<i>Ochna membranacea</i>	<i>Kpindii</i>		x			
<i>Ochthocosmus africanus</i>	<i>Twanyɛi</i>				x	X
<i>Ocimum americanum</i>	<i>Pasmanje</i>				x	
<i>Ocimum viride</i>	<i>Kumui</i>				x	
<i>Octoknema borealis</i>	<i>Kutuwuli</i>					X
<i>Ongokea gore</i>	<i>gbui</i>				x	
<i>Ourtea spp.</i>						X
<i>Oxyanthus speciosus</i>					x	
<i>Palisota hirsuta</i>	<i>ndui-mui</i>				x	
<i>Parinari excels</i>	<i>Dawei</i>	<i>Rof-skin-plɔm</i>		x		X
<i>Parkia bicolor</i>	<i>Gumui</i>			x		
<i>Parkia biglobosa</i>	<i>Kendei</i>	<i>Lokɔs</i>		x		
<i>Peltothorum africanum</i>						X
<i>Pentaclethra macrophylla</i>	<i>Faowe</i>			x	x	X
<i>Pentadesma butyracea</i>	<i>Soilei gboi</i>					X
<i>Phaseplus lunatus</i>					x	
<i>Phyllanthus discoideus</i>	<i>tijoe</i>		x			X
<i>Phyllanthus muellerianus</i>				x	x	
<i>Piper Guineese</i>	<i>Gbain</i>			x	x	
<i>Piptadeniastrum africanum</i>	<i>Mbɛlɛi guli</i>					X
<i>Placodiscus splenditus</i>	<i>Gba-wuli</i>		x			
<i>Portulaca oleracea</i>	<i>Tɔluɛi</i>				x	
<i>Premna angolensis</i>	<i>Gbagbenyemoui</i>			x	x	
<i>Premna hispida</i>	<i>kamajovondoi</i>				x	
<i>Psidium guajava</i>					x	
<i>Psychotria rufipilis</i>	<i>Kafei</i>				x	
<i>Pteridium aquilinum</i>	<i>Gehdui</i>			x		
<i>Pycnanthus angolensis</i>	<i>Kpɔyɛi</i>			x		

<i>Raphia gracilis</i>			x			X
<i>Raphia hookeri</i>			x		x	X
<i>Raphia palma-pinus</i>			x			X
<i>Raphia vinifera</i>			x			X
<i>Rauwolfia vomitoria</i>	<i>Kowogei</i>				x	
<i>Ricinus communis</i>	<i>ngele bondoi</i>					
<i>Rutidea olentricha</i>	<i>Waa</i>				x	
<i>Sabicea vogelii</i>	<i>Namatei</i>				x	
<i>Salacia senegalensis</i>	<i>Gigboi</i>			x	x	
<i>Samanea dinklagei</i>	<i>Saamei</i>		x			X
<i>Sarcocephalus esculentus</i>					x	
<i>Scleria barberi</i>	<i>njaewae</i>				x	
<i>Scoparia dulcis</i>	<i>pondo livali</i>				x	
<i>Secamone afzelii</i>	<i>nDikpagbaa</i>				x	
<i>Selaginella myosorus</i>	<i>Ndimui</i>				x	
<i>Sesamum indicum</i>	<i>MandEi</i>				x	
<i>Sida stipulata</i>	<i>Helui</i>				x	
<i>Smeathmannia pubescens</i>	<i>Ndovotei</i>		x		x	X
<i>Solanum duplosinuatum</i>	<i>kwao-gbolo</i>			x	x	
<i>Spondia mombin</i>	<i>Gboji</i>	<i>Fiks-plom</i>	x	x	x	X
<i>Sterculia tragacantha</i>	<i>Kobei</i>	<i>Abala-lif</i>	x	x		X
<i>Strychnos spinosa</i>	<i>Kokoi</i>	<i>Babu-kalbas</i>	x			
<i>Tarrietia Utilis</i>	<i>Yawii</i>	<i>Hamɔn</i>	x	x		X
<i>Terminalia ivorensis</i>	<i>Baji</i>	<i>Ronko</i>	x		x	X
<i>Tetracera alnifolia</i>	<i>Katatie</i>				x	X
<i>Tetrorchidium didymostemon</i>	<i>Soloi</i>					X
<i>Thaumatococcus daniellii</i>						X
<i>Tieghemella heckelii</i>	<i>Gɔfilei</i>					X
<i>Tragia tenuifolia</i>	<i>morlinyeny</i>					
<i>Trema guineensis</i>	<i>Ngombe</i>					X
<i>Tricalysia deightonii</i>	<i>kpoli wuli</i>				x	
<i>Trichilia heudelotii</i>	<i>Jawei</i>			x	x	X
<i>Triclisia patens</i>	<i>fok-lobae</i>				x	
<i>Tridax procumbens</i>					x	
<i>Trilepis pilosa</i>			x			

<i>Uapacca guineensis</i>	<i>Kondi</i>			x		
<i>Uncaria africana</i>	<i>Rooka</i>				x	X
<i>Vanqueriopsis discolor</i>	<i>Totengei</i>				x	
<i>Visima guineensis</i>	<i>MbEli-mbambei</i>					X
<i>Vitex grandifolia</i>			x			
<i>Vitex micrantha</i>	<i>FÈvÈi</i>		x			
<i>Xylopi aethiopica</i>	<i>Hewei</i>	<i>Siminji</i>	x	x	x	X
<i>Xylopi quintasii</i>	<i>Gbajinei</i>		x			X
<i>Zingiber officinale</i>	<i>kijae</i>				x	

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Appendix B – List of Non-Timber Forest Products found in the eight Gola communities

NTFP Use	Tree Nomenclature			Village							
	Species	Mende	Krio	Vaama	Nyayema	Nemahugoima	Matakahun	Giema	Mapuma	Njanema	Tigbewema
Food	<i>Beilschmiedia mannii</i>	Gba	Tola					x			
	<i>Bussea occidentalis</i>	Hela			x			x	x	x	x
	<i>Dialum guineese</i>	Mabui	Blak-tombla	x	x	x	x	x			x
	<i>Dioscorea cayensis</i>	Mbo	Bush yam	x	x	x	x	x		x	x
	<i>Diospyros spp.</i>	Ndukeh	Bush Banga		x						
	<i>Irvingia gabonesis</i>	BoBo		x	x						
	<i>Nauclea diderrichii</i>	Bundui								x	x
	<i>Nauclea latifolia</i>	Yubuiyambay		x					x	x	
	<i>Pentaclethra macrophylla</i>	Fawa								x	
	<i>Pteridium aquilinum</i>	Gehdui			x						
	<i>Tarrietia Utilis</i>	Yawii	Hamon		x						x
	<i>Trichilia heudelotii</i>	Njawei			x						
Honey	-	-		x				x	x	x	x
Medicine	<i>Aframomum melegueta</i>	Kponi- Gije	Aligator Pepper	x	x		x	x			
	<i>Anthocleista spp.</i>	Pongoi		x		x					
	<i>Beilschmiedia mannii</i>	Gba	Tola			x					x
	<i>Beilschmiedia mannii</i>	Gbei					x				
	<i>Carapa procera</i>	Kowei	Kundi	x	x				x	x	x
	<i>Cassia Siamea</i>	Sheku Turay				x					
	<i>Cassia Sieberiana</i>	Gbangbei		x	x						
	<i>Diopyros heudelotii</i>	Ndukuwolei					x				
	<i>Ficus craterostoma</i>	Gawie	Bush Ataya	x	x	x			x		
	<i>Ficus Mucoso</i>	Kponei					x				
	<i>Garcinia kola</i>	Sagbei	Bitu-Kola	x	x	x	x				
	<i>Glyphaea brevis</i>	Gbagbolei				x					
	<i>Hisbiscus sterculiifoliosus</i>	Kowei		x							
	<i>Morinda geminata</i>	Njasui		x							
	<i>Musanga cecropioides</i>	Ngovui					x				
	<i>Nauclea diderrichii</i>	Bundui		x			x				x
	<i>Nauclea latifolia</i>	Yubuyambe			x						x
	<i>Pentaclethra macrophylla</i>	Fawa								x	x
	<i>Premna angolensis</i>	Gbagbenyemoi				x					
	<i>Selaginella myosorus</i>	Ndimui					x				
<i>Tetracerca potatoria</i>	Katatie			x							
<i>Xylopia aethiopica</i>	Hawei	Siminji	x						x		
	Kurugay	PHOTO	x								
Craft	<i>Eremospatha spp.</i>	Balue	Ratten	x				x	x	x	x
	<i>Laccosperma secundiflorum</i>	Kavui									x
		Ghonofaye	ROPE						x		

Appendix C – List of Questions ask by researchers

GENERAL

- 1 Name of Village:
- 2 Approximate Population:
- 3 Number of households:
- 4 Ethnic groups present
- 5 A Brief history of the village:

NTFPS

- 6 What products do you collect from the forests? (excluding fuelwood and timber)
- 7 Who collects these products (Men, Women, Children)?
(GO THROUGH EACH NTFPS ONE BY ONE)
- 8 What land are they collected from ('private' land, communal land, national park, etc.)?
(GO THROUGH EACH NTFPS ONE BY ONE)
- 9 How long does it take you to walk to the harvesting area?
(GO THROUGH EACH NTFPS ONE BY ONE)
- 10 How often do you collect these products from the forest?
(GO THROUGH EACH NTFPS ONE BY ONE)
- 11 How much do you collect per trip?
(GO THROUGH EACH NTFPS ONE BY ONE)
- 12 How long do you spend collecting these products?
(GO THROUGH EACH NTFPS ONE BY ONE)
- 13 What are these products used for? (i.e., crafts, housing material, medicine, fruit/vegetable, fibre, etc.)
(GO THROUGH EACH NTFPS ONE BY ONE)
- 13 Which trees do these products come from?
(GO THROUGH EACH NTFPS ONE BY ONE)
- 14 What part of the tree is used for this product? (i.e, leaf, bark, root, flower, berry, seed, etc.)
(GO THROUGH EACH NTFPS ONE BY ONE)

15 How do you process these products (ie., what methods are used to change them into usually products)?

(GO THROUGH EACH NTFPS ONE BY ONE)

16 How do you store these products?

(GO THROUGH EACH NTFPS ONE BY ONE)

17 Do you ever sell these products?

(GO THROUGH EACH NTFPS ONE BY ONE)

18 If yes, where do you sell these products? (i.e., local market, Kenema, other villages, Liberia, Guinea, other)

(GO THROUGH EACH NTFPS ONE BY ONE)

19 Who buys these products? (urban vendors, business men, truck drivers, other?)

(GO THROUGH EACH NTFPS ONE BY ONE)

20 How much do they buy?

(GO THROUGH EACH NTFPS ONE BY ONE)

21 How has the collection/trade of these products changed over the last ten years?

22 Are there any specific regulations/rules that influence your trade in these products?

23 What are some major issues that you have had in trading with NTFPs

Fuelwood Products

28 Do you sell firewood?

29 If yes, where? To whom? At what price?

30 Which trees do you use to make firewood? (Take photos of these and write names down)

31 Do you make and sell charcoal?

32 If yes, when did you learn the practice?

33 Who do you sell it to?

34 What trees do you use to make charcoal?

35 How much do you sell a bag for?

Timber and Poles

36 Are chainsaws ever present in the village? (either used/owner by outsiders or by villages)?

37 If yes, how does the system operate?

38 What trees are targeted?

39 Who buys them? Transports them?

40 How much do they sell for?

41 Do you harvest poles in the village?

42 If yes, which trees are harvested?

43 Do you ever sell these poles?

44 If yes, where and to whom?

45 At what prices?

Forest Management

46 Have you noticed a change in forest cover recently (increases, decreases)?

47 If so, what do you believe has caused this?

48 Do forestry staff ever visit your village?

49 If so, what do they say and do?

50 Do you like the forestry staff? Explain

51 Do NGO staff (e.g., Gola, RSPB, CSSL, EFA, WHH, etc..) visit your community?

52 If yes, what do they say and do?

53 Do you like the NGO staff? Explain

54 Do you have local rule/laws about forest use?

55 Who enforces these? (e.g., elder, village chief, section chief, paramount chief)?

56 What are the rules?

57 How well are they enforced?