Walker Institute for Climate System Research

Research Note 3
June 2013

Palm oil, land rights and ecosystem services in Gbarpolu County, Liberia

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Oil Palm Kernels

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Acknowledgements

This research was funded by Rights and Resources Initiative and FERN. The views expressed are not necessarily those of RRI or FERN and the authors are responsible for any errors. We thank all the community members, town elders and local leaders and representatives of NGOs and Government Ministries who participated in the research. We are grateful to Samuel Kwennah, Jonathan Golowo and Joseph Kennedy for assistance with translation and transcription. We thank Prof. Richard Tiffin, Director of the Centre for Food Security and Dr. Giuseppe Feola, Human Environments Research Group for their comments on an earlier version of this report and Kathy Maskell, the Walker Institute, for her assistance.

To Cite this report

Evans, R. and Griffiths, G. (2013) 'Palm oil, land rights and ecosystems services in Gbarpolu county, Liberia', *Research Note 3*, Walker Institute for Climate System Research, University of Reading, June 2013, www.walker-institute.ac.uk/publications/research_notes/WalkerInResNote3.pdf

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Summary

As part of the rebuilding efforts following the long civil war, the Liberian government has renegotiated long-term contracts with international investors to exploit natural resources. Substantial areas of land have been handed out in large-scale concessions across Liberia during the last five years. While this may promote economic growth at the national level, such concessions are likely to have major environmental, social and economic impacts on local communities, who may not have been consulted on the proposed developments. This report examines the potential socio-economic and environmental impacts of a proposed large-scale oil palm concession in Bopolu District, Gbarpolu County in Liberia. The research provided an in-depth mapping of current resource use, livelihoods and ecosystems services, in addition to analysis of community consultation and perceptions of the potential impacts of the proposed development.

Ecosystem services mapping suggests that the concession could have significant environmental consequences resulting from the loss of Closed forest, a globally significant carbon store also characterised by high levels of biodiversity. Participatory workshops revealed the centrality of land and forest resources to people's livelihoods, food security, sense of belonging and cultural identity in the present and in the future in rural communities. The 63-year concession lease was regarded by many community members as infringing their customary land rights and alienating the land and natural resources they depended on.

The most salient potential risks of the proposed palm oil concession identified include:

- loss of livelihoods, food insecurity and potential for chronic poverty
- loss of customary rights to land and forest resources and access to cultural sites, threat to identity and place-based sense of belonging
- growing marginalisation of vulnerable groups and increased gendered and generational inequalities
- conflicts over land and resources, displacement of rural communities and rural-urban migration
- restricted mobility and reduced access to basic services due to security measures on plantation land
- pollution of water sources and reduced access to safe drinking water
- potential loss of biodiversity, particularly the Upper Guinean Forest Ecosystem, which includes globally endangered and vulnerable bird species in the Upper Guinean Endemic Bird Area.
- land clearance of substantial areas of Closed forest and the resulting reduction in current carbon storage and future sequestration capacity.

While community members may benefit from improved physical and social infrastructure (such as roads, schools and health clinics, better quality housing and employment opportunities), efforts are needed to provide equal access to basic services and to ensure that existing social inequalities are not reinforced. Employment opportunities should be made available to men and women of different ages and educational backgrounds and skills to ensure a diverse range of local residents benefit from the proposed development. All residents should have access to improved basic services and infrastructure, rather than only company employees. An Outgrower programme, an oil palm mill and/or the promotion of other non-farm/ non-forest livelihood opportunities could provide important alternative livelihoods within affected communities.

Considerable frustration was expressed about the limited consultation with community members to date about the proposed concession, resettlement and compensation plans. This highlights the importance of a rigorous process of Free, Prior and Informed Consent and agreeing appropriate resettlement and compensation plans with community members before operations start, informed by nationally agreed standards (such as crop compensation prices) and internationally agreed principles (such as the Roundtable on Sustainable Palm Oil Principles), in accordance with the UN Declaration on the Rights of Indigenous Peoples (2007) and other UN human rights conventions.

Accurate surveying of the land and community resource use (including customary land rights) is needed within the study area and the wider concession. This would enable the identification of potential areas that are suitable for palm oil with minimal environmental, social and economic impacts. A variable distance related to settlement size around each settlement is needed to ensure that community members have continued access to their farms and other natural resources, including within the extant Closed forest. A programme of surveying should be linked to a programme of intensive fieldwork with community members to develop an improved spatial framework of landscape units across the whole concession. This would enable more accurate information on land cover and resource use to be integrated within a comprehensive assessment of ecosystem services at landscape scales.

This case study of a palm oil concession in Liberia highlights wider policy considerations regarding large-scale land acquisitions in the global South:

- Formal mechanisms may be needed to ensure the process of Free, Prior, Informed Consent takes place effectively with affected communities and community land rights are safeguarded.
- Rigorous Environmental and Social Impact Assessments need to be conducted before operations start. Accurate mapping of customary land rights, community resources and cultural sites, livelihoods, land use, biodiversity and ecosystems services is a critical tool in this process.
- Greater clarity and awareness-raising of land tenure laws and policies is needed at all levels. Good governance and capacity-building of key institutions would help to ensure effective implementation of relevant laws and policies.
- Efforts are needed to improve basic services and infrastructure in rural communities and invest in food crop cultivation in order to enhance food security and poverty alleviation. Increasing access to inputs, equipment, training and advice is especially important if male and female farmers are no longer able to practice shifting cultivation due to the reduction/ loss of customary land and the need to farm more intensively on smaller areas of land.

1. Introduction

Liberia is rich in valuable natural resources including iron ore, diamonds, gold, timber and large areas of land that are particularly suitable for the cultivation of export cash crops such as rubber and palm oil. Almost 84 per cent of the population of Liberia is estimated to be living in poverty, however, and the country is ranked 174th out of 186 in the 2013 Human Development Index (UNDP, 2013). As part of the rebuilding efforts following the fourteen year long civil war, the Liberian government has renegotiated long-term contracts with international investors to exploit these natural resources. Accounts suggest that between 30 to 50 per cent of the land in Liberia has been handed out in large-scale concessions in the last five years (CICR, 2012; Oxfam, 2012a). RRG (2013) identified over 5.1 million hectares of land allocated to government concessions in Liberia, with mining accounting for 56 per cent of the total identified land area, forest products for 21 per cent and agriculture for 19 per cent. Palm oil producers are estimated to account for 12 per cent of total concession areas in Liberia (RRG, 2013). While investments by transnational corporations may promote economic growth at the national level, such concessions are likely to have major environmental, social and economic impacts on local communities, who may not have been consulted on the proposed developments.

This report examines the potential environmental and socio-economic impacts of a proposed palm oil concession in Bopolu District, Gbarpolu County, Liberia, based on ecosystems services mapping and participatory workshops with local communities. Following a brief discussion of the research context, the palm oil concession and the methodology, the report maps people's livelihoods, land rights and ecosystems services and discusses community perceptions of how these may be affected by the proposed concession. It explores how some of the potential negative environmental and socio-economic impacts of the concession could be mitigated and positive impacts enhanced and identifies wider policy implications.

1.1 Research Context

Palm oil is an increasingly important international commodity used in a wide range of products including foodstuffs and bio-fuels. The European Union, for example, adopted the Renewable Energy Directive in 2009 which sets binding targets (20%) for renewable energy including from biomass (biofuels and bioliquids) (EU, 2013a). There is unresolved controversy about the environmental and socio-economic impacts of bio-fuel production, especially from palm oil production. A recent report by Oxfam (2012b) argues that global bio-fuel production adversely impacts on global food security as a result of loss of land for growing locally consumed crops and through increases in food prices. Similarly, others have argued that Indirect Land Use Change (ILC) may actually increase global Greenhouse Gas Emissions (GHG) as a result of the conversion of the ecosystem (especially tropical forests, natural grasslands and peatlands) to palm oil production. However, in the context of EU policy, a recently published report (EU, 2013b) on renewable energy progress and biofuels sustainability downplays this impact. The report argues instead that biofuels are likely to remain an important part of the EU strategy towards meeting renewable energy targets.

The focus of this report is upon the local impacts of a proposed palm oil concession on the environment and people's livelihoods and land rights in Gbarpolu County, Liberia. Research from many different African countries has shown that land is central to people's livelihoods and sense of financial and emotional security both in the present and in the future (Toulmin, 2008; Whitehead and Tsikata, 2003). Rural poverty is often associated with a lack of land and livestock and an inability to develop alternative non-farm livelihood activities in response to diminishing agricultural opportunities (Ellis and Mdoe, 2003). As a recent UNDP (2012: 137) report notes, secure access,

tenure, use and control of land, whether through customary systems or legal means, are essential to achieving food security and to protecting women and vulnerable groups from injustices related to the arbitrary management of land.

In the context of Liberia, international investors such as Sime Darby and Golden Veroleum Liberia have acquired the rights to use large tracts of land to develop large-scale oil palm plantations. As UNDP (2012: 123) notes, 'With the appropriate legal framework and physical infrastructure, large-scale land acquisitions could bring development-friendly foreign investment directly to African economies by making productive use of *undercultivated* areas'. Potential benefits are identified as: increased financial liquidity in rural areas, improved rural infrastructure and the modernisation of agriculture (UNDP, 2012). Local communities may benefit from some new jobs, higher tax revenues, and new social and physical infrastructure. However, such benefits are by no means guaranteed and the risks of exacerbating poverty, food insecurity and social inequalities are high:

> In countries where most people work in agriculture, such large-scale investments may separate people from their land without creating opportunities in nonfarm sectors, aggravating poverty, unemployment and food insecurity— and perhaps accelerating urban migration before cities are ready to absorb more people (UNDP, 2012: 125).

Furthermore, international investments to date have not focused on food crops, but rather on non-food agricultural products such as biofuels, industrial cash crops, and conservation, game reserves, livestock and plantation forests. This is a particular cause for concern in Africa where, despite abundant agricultural resources, some regions of the continent remain food insecure and significant investment in improving the agricultural productivity of food crop cultivation is needed (UNDP, 2012).

Private investors usually prioritise their own objectives over the wellbeing of those living in rural communities. The power imbalance between large multinational companies and government representatives on the one hand and uneducated smallholder farmers on the other may result in a lack of transparency and opportunities for corruption and other misconduct (UNDP, 2012). This undermines the process of 'prior, voluntary and informed consent' of local communities affected by land acquisitions and may result in grievances and tensions, which may be heightened in post-conflict contexts such as Liberia (Unruh, 2009).

1.2 The Palm Oil Concession

Sime Darby is a multinational conglomerate with its headquarters in Malaysia. It is one of the world's largest producers of palm oil, representing approximately 6 per cent of the world's annual Crude Palm Oil output (SD, 2011). It is one of the founding members of the Roundtable on Sustainable Palm Oil (RSPO). As the Roundtable on Sustainable Palm Oil (RSPO) and Forest People's Program (2008) notes, 'Free, Prior and Informed Consent' (FPIC) has emerged as a key principle in international law and jurisprudence related to indigenous peoples and has been endorsed by the RSPO as a key principle in its Principles and Criteria. In line with international human rights law, the FPIC principle implies:

> informed, non-coercive negotiations between investors and companies or the government and indigenous peoples/ customary law communities prior to oil palm estates, timber plantations or other enterprises being established and developed (RSPO and FPP, 2008: 3).

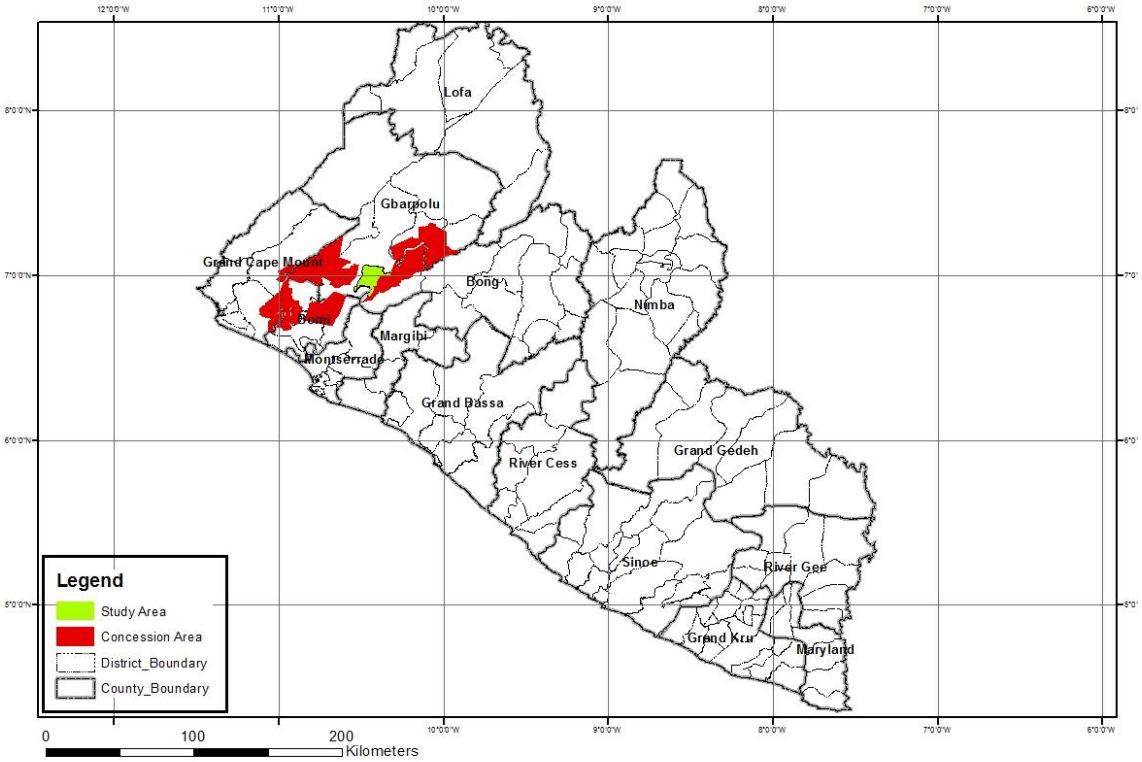
Sime Darby Plantation (Liberia) Inc. was granted a 63 year lease by the Liberian government in 2009 for an agricultural concession covering 311,187 hectares to the northwest of Monrovia in Grand Cape Mount, Bong, Bomi and Gbarpolu counties (see Figure 1). Of this area, 220,000 ha is for oil palm plantation development and 44,000ha is for an Outgrower's Programme.

Sime Darby (SD) (2011) reports that it started the development of new operations in the concession in Liberia in July 2010. In June 2011 Sime Darby commissioned an independent baseline social and environmental assessment for Bopolu District, Gbarpolu County conducted by Green Consultants, an environmental consultancy group. GreenCons (2011) report that an estimated total of 3,500 workers will be employed during site preparation, construction and the operational period and recommends that where possible, local people should be given priority for employment.
The clearing of forest areas for use as a large-scale oil palm plantation has mainly occurred in Grand Cape Mount and Bomi county to date (CICR, 2012). However, a complaint was lodged with the Roundtable on Sustainable Palm Oil (RSPO) against SD's Plantation Division in September 2011 by non-governmental organisations, Forest Peoples Programme and the Green Advocates of Liberia. The complaint alleged that on the Matambo Estate local farmers were evicted from their customary land without their consent, which is a violation of RSPO principles and criteria (SD, 2011).

Sime Darby was forced to cease operations in the area and commissioned an independent review of the process of Free, Prior and Informed Consent (FPIC). This controversy resulted in tensions and rioting among local community members and Sime Darby contractors in December 2011, to which the company responded by firing 700 contractors (CICR, 2012). According to a CICR report and a Heritage news report (7 October 2011, cited in CICR, 2012), the Environmental Protection Agency imposed two fines on Sime Darby for a total of US$ 50,000 due to 'non-compliance with the terms and conditions' of their environmental permit, as well as alleged non-payment of compensation to farmers. Sime Darby's report, *Sustainable Development Futures*, concludes, on the page of the report discussing the setbacks in Liberia: 'We are firmly committed to be a responsible partner for the development of a sustainable palm oil industry in Liberia' (SD, 2011: 56).

According to the 2008 National Population and Housing Census, the total population of Liberia is approximately 3.5 million, while Gbarpolu County has a population of around 83,400 (LISGIS, 2011). An estimated 17,700 people live in Bopolu district, where the study area is located (see Figure 1) (LISGIS, 2011). Gbarpolu is the county with the lowest population density and the lowest level of access to healthcare in Liberia; only 32% had access to a health facility within 5km in 2011 and this had not changed over the previous five years (LISGIS, 2011). The Green Consultants (2011) report cites the low population and high poverty rate in the county in support of the 'Statement of need' for the concession.

Figure 1. The location of the study area and the Sime Darby concession in Liberia



1.3 Aims and Objectives

The primary purpose of this research was to identify the potential impacts of the proposed plantation on the environment and on people living in Bopolu district to inform key stakeholders, including local communities, the government and NGOs. The study sought to achieve this through an evaluation of:

- the environmental impacts including: impacts on soil and water resources; land use; impact on flora and fauna - biodiversity; impact on opportunities to grow or hunt for food, medicines etc;
- the social impacts including: the local economy and development, livelihoods of the local population in the area, cultural heritage, land claims, land use rights and tenure, safety and security;
- the Environmental and Social Impact Assessment (ESIA) submitted by Sime Darby to the Environmental Protection Agency, to highlight areas of concern including limitations of the ESIA;
- and to recommend mitigation measures clearly outlining those targeting the company, the government, and those directed to the affected or would be affected communities.

It should be noted that this research did not seek to provide a comprehensive environmental and social impact assessment of the whole agricultural concession, but rather to provide an in-depth case study of the potential effects of a large-scale palm oil plantation on the environment and people's livelihoods and customary land rights in Bopolu district (see study location in Figure 1). The study was based predominantly on mapping ecosytems services and qualitative analysis of community perceptions, as discussed in Section 2.

2. Methodology

2.1 Environmental assessment

The potential environmental impact of oil palm plantation establishment may be categorised into three principal effects: change in the global Greenhouse Gas (GHG) balance, erosion and reduction of biodiversity by fragmentation, disturbance and destruction of natural habitats. The overall approach, given the relatively large size of the proposed plantation at Bopolu and the significant extent of the concession overall (311,187 ha; Figure 1) has been to develop a *spatial framework* within which to evaluate habitats, soil and water resources and ecosystem services.

2.1.1 The spatial framework

The approach is based originally on the land evaluation and classification techniques developed for natural resource assessment and mapping (FAO, 1976). Fieldwork combined with the integration of available additional information is generally employed to assign attributes to each spatial unit based on its specific attributes determined by differences in geology, soils, topography and land use.

The spatial units provided the framework within which to evaluate the ecosystem services provided by each Landscape unit and to characterise typical habitats and environmental conditions. This was achieved based on fieldwork including 'ground-truthing' (validation) of satellite image land cover mapping and meetings with local people in the majority of the settlements affected by the proposed plantation in Bopolu district.

2.1.2 Ecosystem goods and services

The ecosystem approach is becoming commonplace for evaluating the benefits to humankind provided by natural resources. The concept was used extensively in the Millennium Ecosystem Assessment (MEA, 2005) as a means to evaluate both the potential services provided by ecosystems across the globe and the current level of damage to those ecosystems arising from human activity.

The advantages of the approach are that it:

- Recognises the importance of multi-functional landscapes, i.e. landscapes that provide a range of different services;
- Is applicable at a range of scales from the local to the global;
- Recognises that ecosystems provide four critically important components of human health, including (Figure 2):
  - Provisioning services
  - Regulating services
  - Supporting services
  - Cultural services

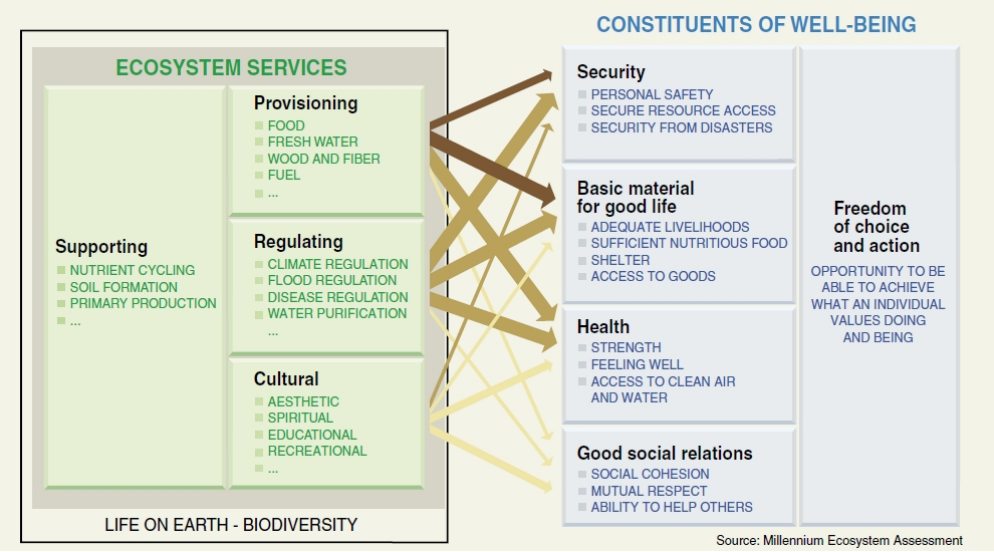


Figure 2. Ecosystem services and human well-being (arrows represent the strength of the linkages between the services and the constituent of well-being) [**source**: MEA, 2005]

The Ecosystem-based Approach (EBA) was used within this report to provide an assessment of the benefits of different ecosystems to local people within the proposed concession. Ecosystems also provide services at global scales (regulating the global carbon budget, for example) and on longer time scales (supporting ecosystem functioning: the nutrient cycle, soil-forming processes etc.). In the context of these services, information derived from the scientific literature was used in support of expert judgement about ecosystem services and functioning.

2.2 Fieldwork, data and the study area

Field data collection for Phase I (Environmental Assessment) was undertaken over a period of five days from 25th to 29th June, 2012. The fieldwork included:

- General observation of the landscape, including soil type, identification of timber valuable trees, patterns of cultivation and principal land cover types;
- GPS waypoint and tracks for as many settlements, roads and forest paths as possible;
- Meetings with members from each community including: Small Bong Mines, Sao, Dwana, Totoquelleh, Lowomah, Coleman, Blunga, Monbili'ta, Boloyala and Gaynimah.

Meetings were organised via the town elder and the researcher conducted a semi-structured interview based on a standard set of questions. This work was supplemented extensively with the results from the focus groups at three communities (Section 2.3) based on the second period of fieldwork in November 2012.

2.2.1 External data-sets

A number of external data-sets were obtained, all obtainable by fast internet link to data centres (Table 1).

Table 1. External data–sets and sources

Data-set	Source
SRTM Digital Elevation Data (DEM)	The Shuttle Radar Topography Mission (SRTM) provides high resolution mapping of the earth's surface at 1 arc second of latitude and longitude (approximately 30 meters). The data can be represented as a DEM or contours (http://www2.jpl.nasa.gov/srtm/dataprod.htm.
Landsat ETM satellite imagery	Enhanced Thematic Mapper (ETM) image with a 30m spatial resolution in 3 spectral bands; acquired October 2010 (http://eros.usgs.gov/#/Find_Data/Products_and_Data_Available/ETM)
Topographic mapping	Obtained variously from in-country sources including LISGIS (Liberia Institute of Statistics & Geo-Information Services)
GPS waypoint & tracks	Collected in the field using a Garmin GPS Montana
Google imagery	From Google Earth (http://www.google.com/earth/index.html) downloaded using Shape2Earth Globe software (http://shape2earthengine.com/shape2earth/Shape2Earth_Globe.html)

2.2.2 Soils and Geology

Detailed soil mapping of the region was not available to the researcher and for this to be useful to the environmental assessment, soil information would need to be at scales of >1: 50 000. The region is classified as a Plinthic ferrasol (relatively poorly drained, sandy clay loam) but the coarse resolution of this mapping is insufficiently detailed for assessment or planning purposes (FAO/IIASA/ISRIC/ISSCAS/JRC, 2012). However, field observations indicate that the region is mostly leached latosols with patches of sandy regosols. Swamp soils are also extensive. It was not possible during the relatively brief period of fieldwork to undertake detailed soil mapping.

2.2.3. Topography

Medium-scale topographic maps of the region were not available to the researcher and it is not known whether modern maps at this scale are available for this region of Liberia from the Liberian Mapping Agency (LISGIS). Elevation data from the Shuttle Radar Topography Mission (SRTM) was downloaded from the USGS (United States Geological Survey) internet site (Table 3). This provides a DEM (digital elevation model) for the globe at 3 arc second resolution (30m grid size).

Elevations vary from approximately 150 to 300m and slopes are nowhere steep, attaining a maximum of 10 degrees in only a few locations. The topographic information combined with field observations was used to generate the Landscape units for the area of the concession (Figure 3). These units provided the spatial framework for subsequent analysis, especailly of ecosystem services.

2.2.4 Hydrology

Rainfall in the region is high (in excess of 2000 mm/annum) resulting in an extensive network of creeks and rivers which, combined with the undulating/steep topography results in a typically dendritic drainage network. Water from creeks and streams are of critical importance as water supply for local people. It was not possible to map the dense drainage network in detail – mapped information apart from showing the larger rivers (Figure 3) does not exist and mapping from satellite imagery is not possible given the generally dense cover of vegetation.

2.2.5 Land cover

Image classification provides a rapid means to derive accurate information on land cover distribution and extent. Land cover at Bopolu was classified (Figure 5) from the Landsat Thematic Mapper (TM) image for October 2010, using a standard maximum likelihood classification technique that assigns each 'pixel' (picture element) in the image to a class depending upon its reflectance in multiple input bands imaged by the satellite in the visible, middle and near-infrared wavelengths. A standard (modified) typology was used, the FAO Land Cover Classification System (LCCS; FAO, 2000). The accuracy of the classification was checked qualitatively based on control points collected in the field with a GPS (Global Positioning System). In general, for the broad land cover classes identified, the accuracy of the classification is high. The area (ha) and percent of each of the broad land cover types is shown in Table 2.

The spectral distinction between *Closed dense* and *Open dense forest* (>5m) is distinct (obvious differences in the colour/texture of these two types on the image), enabling the area of Closed forest to be mapped with a high degree of accuracy. *Open forest* is mostly secondary, in a later stage of succession from former cultivation. Areas of current cultivation (mostly rice, cassava etc.) are also spectrally distinct, enabling the area of cultivated land (*Mostly cropland*) in the contemporary landscape to be estimated at (less than) 10 percent. However, this category is generally found as a complex mosaic of cultivated/fallow land with shrubland in various stages of succession following abandonment in a transition to secondary (Open) forest. The classification shows that the area of Closed forest is significant, amounting to 40 percent of the total (Table 2).

Table 2. Land cover area/percent classified from the October 2010 Landsat TM satellite image based on FAO Land Cover Classification System (LCCS) (abbreviations used in the text shown in brackets).

Land cover (FAO, LCCS)	**Ha**	**Percent**
Closed (>40%) broadleaved evergreen and/or semi-deciduous forest (>5m) (**'Closed forest'**)	7094	40.0
Closed to open (>15%) broadleaved evergreen or semi-deciduous forest (>5m) (**'Open forest'**)	8719	49.0
Mosaic cropland (50-70%) / vegetation (grassland/shrubland/forest) (20-50%) (**'Mostly cropland'**)	1666	9.0
Developed land, Bare areas & no data (clouds/cloud shadow) (**'Bare surfaces'**)	235	2.0
Water	Negligible	negligible

Figure 2: Closed forest

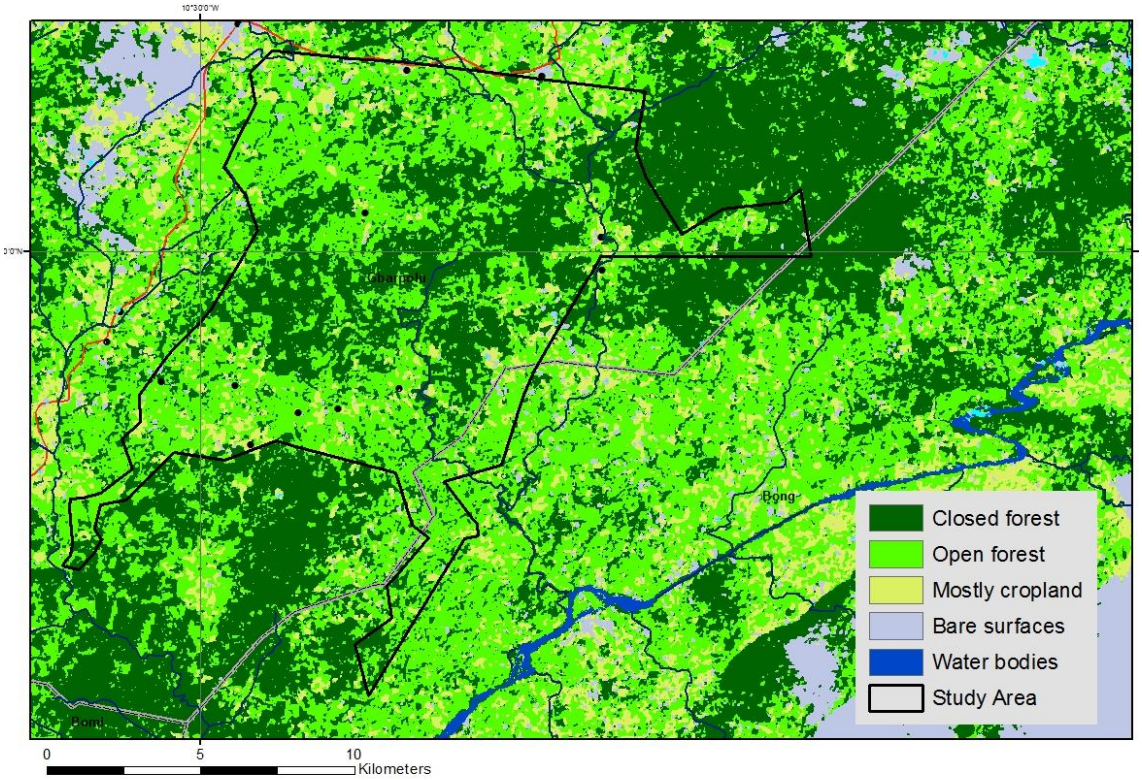
However, the mosaic of recently cleared land/Open forest in different stages of succession is complex and, without substantial additional analysis based on higher resolution satellite imagery and more extensive fieldwork, it was not possible to distinguish between these different successional stages. Similarly, it was not possible to discriminate within Closed forest between undisturbed forest (Primary forest that has never been logged/cultivated) and disturbed forest. This would require extensive botanical survey on the ground in support of more detailed analysis of imagery from a range of sources and from different acquisition dates.

Figure 3: Mosaic of recently abandoned cultivation and Open forest (background)

Figure 4: Swampland

An important category that could not be mapped from the imagery was swampland, tending to occur in relatively small patches within the mosaic of cultivated land/secondary woodland.

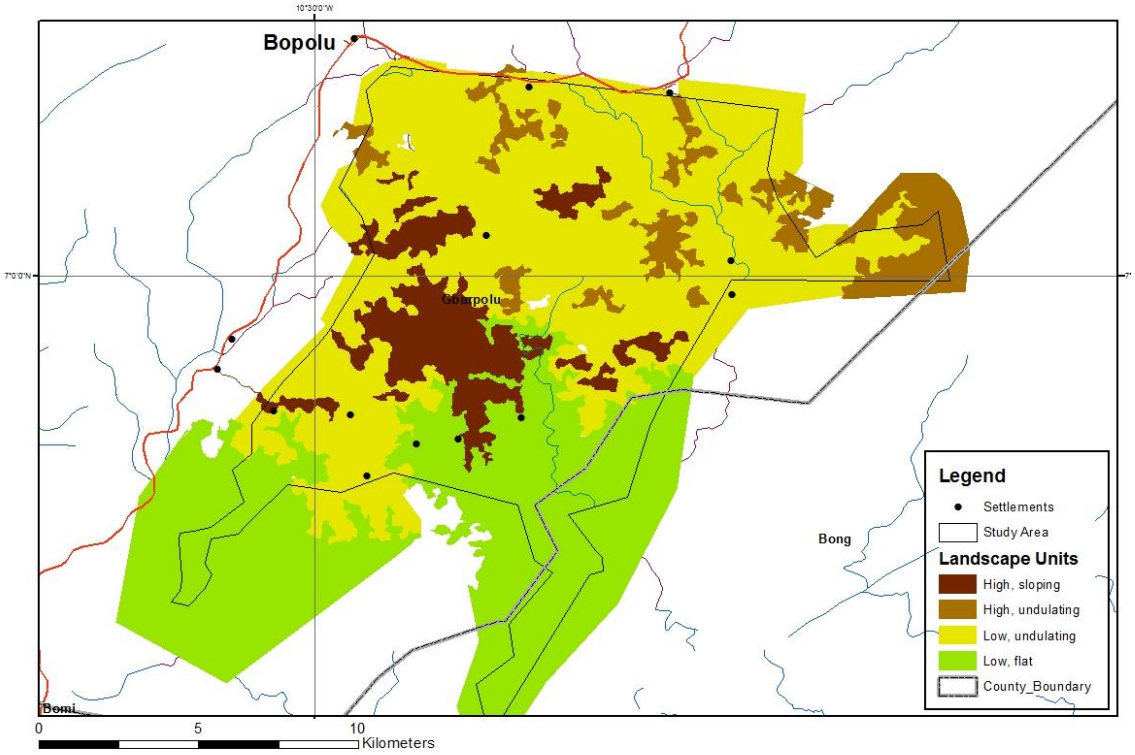
Figure 5. Landsat TM satellite image (acquired October 2010) classified into five broad land cover classes for the Bopolu concession [**typology:** FAO Land Cover Classification System].



2.2.6 Landscape Units

Maps of soils type, geology and topography were integrated into the map of landscape units to provide the spatial framework for the assessment of ecosystem services within the study area (Figure 6). The integration was undertaken visually using GIS mapping technology.

Figure 6. Landscape units for the Bopolu concession.



2.3 Social assessment

2.3.1 Aims and objectives

Phase II of the research (Social Assessment) was designed to complement Phase I (Environmental Assessment). Fieldwork took place over five days from 29th October to 2nd November 2012. Phase II aimed to examine the potential socio-economic impacts of the proposed oil palm plantation on people's livelihoods and access to land, natural and community resources. Community perceptions of the potential impacts of the proposed changes in land use on different social groups were investigated. These aims were addressed through the following objectives:

- To map men's, women's and young people's current livelihood strategies, property rights and access to natural and community resources, including cultural sites.
- To investigate local communities' interactions with key stakeholders and involvement in decision-making processes regarding the concession and proposed resettlement plans
- To explore perceptions of the benefits and drawbacks of the proposed oil palm plantation for different social groups among key stakeholders (local communities, community leaders, governmental and non-governmental staff)
- To examine how potential benefits of the concession could be enhanced for local communities and how negative impacts could be mitigated.

2.3.2 Methods

A qualitative, participatory methodology that paid attention to differences of gender, age and place was considered most appropriate to gain an in-depth understanding of people's perspectives for this study. Three communities with differing population size and location/ proximity to the agricultural concession (Totoquelleh, Monbili'ta and Small Saw Mill) (Figure 7) were selected to represent a diversity of experiences and perspectives on the proposed large-scale oil palm plantation. Eight participatory workshops were conducted with a total of 48 participants. Workshops were conducted with separate groups of men, women and young people (aged 17 - 31) where possible, resulting in two or three workshops of between two and eleven participants in each of the three locations (see Table 3 for breakdown of participants). The workshops lasted between 30 minutes and 2 hours 15 minutes each. It was not possible to organise a separate focus group with young people in one of the communities, although young men and a young woman participated in the men's and women's focus groups. Women were more reluctant to participate in the workshops in all locations, resulting in fewer women participants. While this small qualitative sample cannot be seen as representative of all affected communities in the Bopolu concession, the research with different genders and age groups provided in-depth insights into a range of perspectives and experiences of different social groups resident in communities of differing size and location.

The workshops were designed to be interactive and enable all members of each group the opportunity to speak. The 'participatory diagramming' technique (Kesby, 2000) of mapping of natural and community resources was used to facilitate their involvement and construct visual representations of the places they considered most important for different groups. It was not considered appropriate to conduct the mapping activity in two of the workshops with small numbers of participants, but instead the researchers facilitated discussion of key places and resources in their locality. The researchers worked with an interpreter to interpret into and from local languages and the discussions were audio-recorded, following verbal consent from participants.

In addition to the workshops, six interviews were conducted with strategic stakeholders (lasting between 30 minutes to 1 hour 30 minutes each), including representatives of local authorities involved in land allocation and decision-making processes at the District and County level, non-governmental development practitioners and governmental policymakers working at the national level, such as the Sustainable Development Institute, the Ministry of Internal Affairs, Ministry of Agriculture and the Land Commission.

The audio-recordings of the workshop discussions and interviews were transcribed in full and translated into English by research assistants. The transcripts of the focus group discussions and interviews and visual data were coded, summarised and analysed to identify key themes to inform the writing of the report in relation to the research objectives.

Figure 7. Location of communities visited during fieldwork in July/November 2012 (yellow), plus location and type of resource uses.

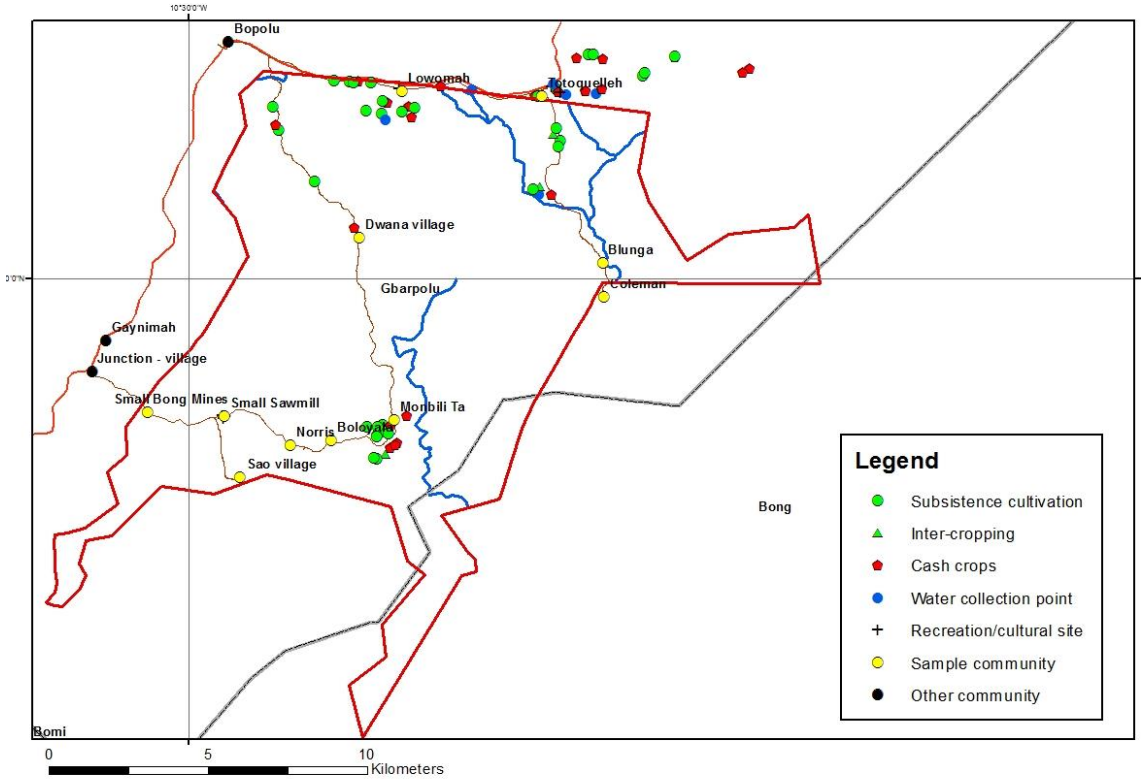


Table 3. Characteristics of participants involved in Phase II of the research

Workshop participants (8 workshops)	**No. of young men (aged 17-31 years)**	**No. of young women (aged 20–30 years)**	**No. of men (aged 35-75 years)**	**No. of women (aged 35-75 years)**
Workshops in location 1	4	5	8	4
Workshops in location 2	2	3	11	3
Workshops in location 3	4	1	2	1
Total:	**10**	**9**	**21**	**8**
Total no. of community members: 48				
Strategic stakeholder interviews (6 interviews)				
Representatives of local authorities (district/ county level)			2	
Representatives of government Ministries (national level)			3	
Representatives of NGOs (national level)			3	
Total no. of strategic stakeholders: 8				

2.3.3 Ethical considerations

Ethical approval for the research was granted by the University of Reading School of Human and Environmental Sciences Research Ethics Committee in October 2012. The research also conforms to the ethical protocols of the Social Research Association and British Sociological Association. Respect for privacy, confidentiality and rights to anonymity are paramount, as is the safety and security of the researchers and research participants. Written outputs and the dissemination

strategy ensure participants' anonymity, including when direct quotations are provided. The researchers negotiated informed verbal consent to participate with all participants before commencing community workshops and interviews. Participants' right to withdraw at any time was emphasised and confidentiality within the group was discussed at the start of workshops.

3. Research findings

3.1 Current livelihoods, food security and access to resources

The participatory workshops revealed the centrality of land and forest resources to people's livelihoods and food security in rural communities in Bopolu district. As one participant commented: *'We depend on our forest for living. We live by hunting, we make farm, we use baskets to fish. Everything we do we depend on the forest. Our living is on our forest'*. The majority of participants (men and women) were small-scale farmers engaged in shifting cultivation, using a portion of their family land for farming each year. They reported growing a wide range of food crops (rice, cassava, maize, plantain, beans, groundnuts, cola, sugarcane), fruit (pineapples, bananas, oranges) and vegetables (potatoes, pepper, 'bitter bulbs', eddoes) for consumption and sale, as well as export cash crops, such as rubber, cocoa and coffee. Participants stored rice to sustain them through many months of the year, but commented on the difficulties of storing other food crops and vegetables.

Poor road conditions and limited transport restricted the potential income that could be earned from cocoa, coffee and other products. Many young and older men had however, recently planted large rubber plantations and saw this as a good investment for the future, in terms of providing a sustained income for themselves and their children. People were not accustomed to planting oil palm, since the trees grew naturally in sufficient quantity to meet their needs for locally produced palm oil and people had communal property rights to the products of wild oil palm trees:

> *'Oil Palm? You can't find it here that much, but for rubber you can find it because people know the importance.[...] You go and see the palm in the forest, cut it, you get one drum, you take out two or three gallons for yourself, the balance one you can carry to the market to get other things for yourself'.*

Participants also relied on a range of other forest resources for nutritional and medicinal purposes, as well as forming important elements of their livelihood strategies. Men set traps for and hunted a wide range of animals, including different species of duiker (described as black deer, black back, water deer and red deer), ant bear, ground hog, porcupine, monkey, as bushmeat for consumption and sale. Participants usually walked for three to four hours into the forest to hunt and could catch up to seven animals per night, but sometimes walked for up to 12 hours from their home. Some participants considered that the animal population was plentiful, while others thought that animals were retreating further into the forest away from human settlements, which meant that they had to move deeper into the forest for hunting. Women were often involved in transporting and selling bushmeat in markets and sometimes buyers came from Monrovia; participants usually earned between 2,000-3,000 LD per carcass [equivalent to 27-40 US$], but could earn more for large red deer.

Fishing (hook fishing and using baskets) was an important livelihood strategy that women often engaged in during the dry season, as well as representing an important source of protein for families. Women could earn 1,500-2,000 LD per catch [equivalent to 20-27 US$] which they sold in local markets. Men and women commented that the income from the sale of their surplus harvest,

bushmeat and fish enabled them to pay for their children's school fees, medical costs and other household expenses.

Timber also provided a source of income for local communities; logging companies paid a local tax to communities and some young men occasionally obtained casual work sawing planks. A few participants reported sometimes engaging in artisanal alluvial gold mining, although it was not common in the study locations. Other livelihood strategies included: keeping livestock (goats, sheep and cattle), small business activities, such as selling goods and groceries and weaving cloth (women), providing motorbike transport (men) and casual work mining sand for construction (young men). In one of the research locations, young men had been employed by Sime Darby as wage labourers for a period of approximately one year to clear land near the road, but had been unemployed since the company was forced to stop operating in the area. They reported that they were paid 3 US$ a day.

Participants collected firewood from their farms, which were usually located up to one hour's walk from the town/village, although a few participants' farms were up to two hours walk away. They cited different plants, herbs and tree bark obtained from the forest that were used by traditional healers and other community members to treat a range of ailments and illnesses, especially those affecting young children. Community members also used branches and rattans from the forest and obtained thatch from the swamps for house construction.

In the participatory mapping exercise (see Figures 8a, b and c), participants revealed a detailed knowledge of the forest and marked the areas where high canopy trees were located, creeks and other water sources, different types of farmland and plantations and the boundaries with other communities. Participants were asked to mark on the map the places they regarded as most important to men (using green stickers), women (purple stickers) and young people (yellow stickers). Important community resources marked on the maps included the water pumps, primary school, market, clinic, vocational training centre, football pitch, church and mosque, the blacksmith's kitchen. Water pumps, the creeks, the market, clinic, training centre were regarded as particularly important to women, while the school, football pitch, water pumps and training centre were seen as important to all young people. Cultural sites located in the centre or at the edge of the town marked on the maps included: the cultural shrine/ town cornerstone; the cemetery; the grave of elders and founding members of the town, such as 'Chief Sao Boso's site', which was regarded as '*the most historical point in Gbarpolu county*'; the *Poro* (male) and *Sande* (female) bush [informal education and training schools to initiate boys and girls into traditional secret societies]; women's cultural centre, women's meeting place and men's meeting place [where matters related to land were often discussed under a large tree]. Many of these cultural sites were regarded as particularly important either to men or women, while all the groups saw the forest, farmland, creeks and the road as important for everyone. In the map of Small Saw Mill (Figure 8c), Sime Darby's temporary site was shown on the edge of the village and marked by men as important, especially to young people.

Figure 8a: Resource map produced in workshop with young people in Totoquelleh

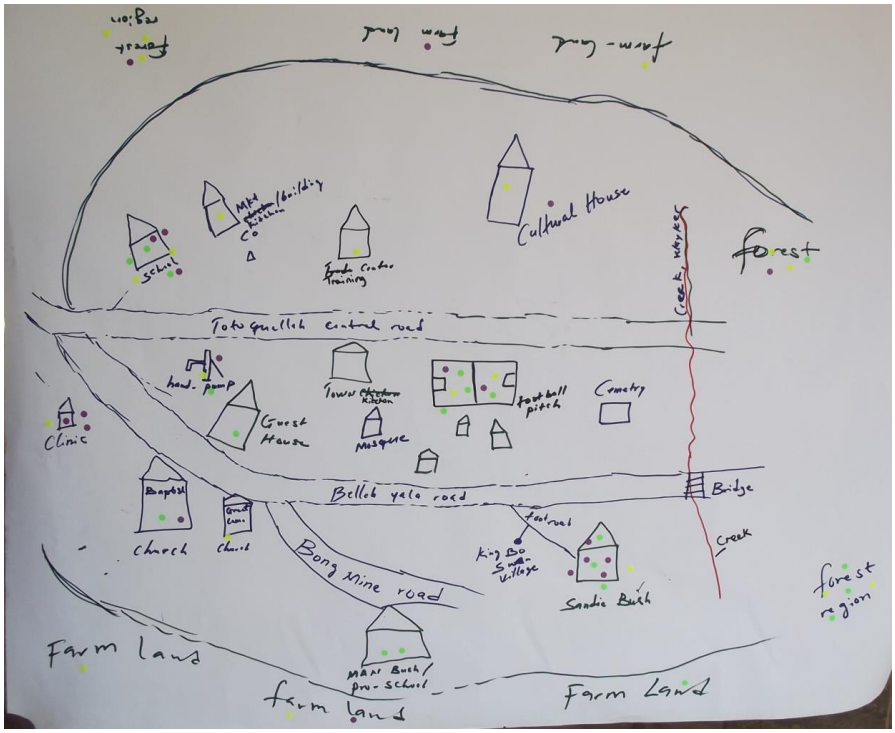


Figure 8b: Resource map produced in workshop with women in Monbili'ta

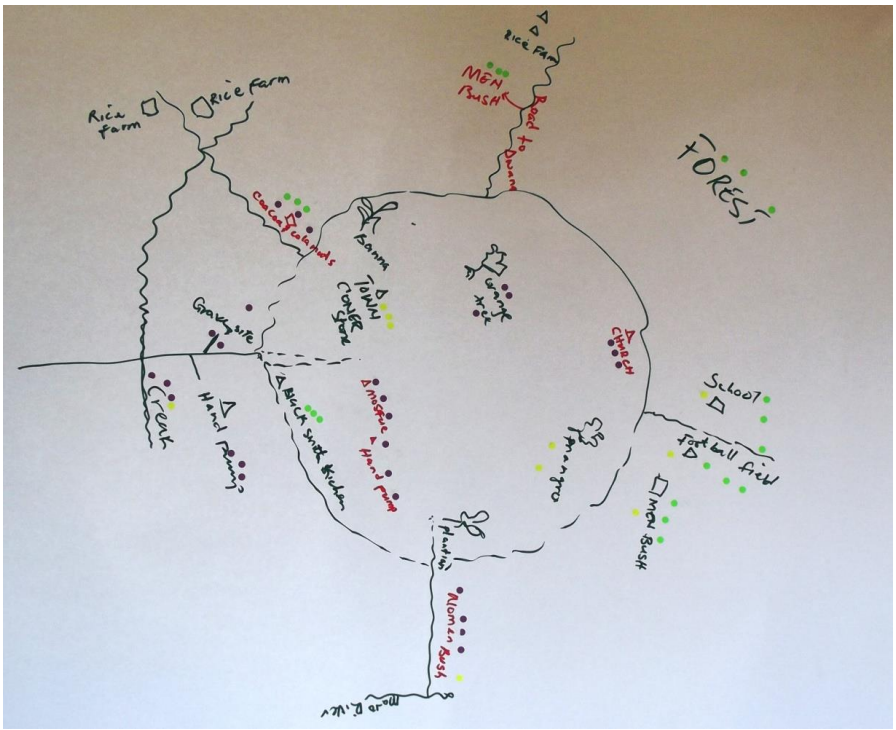


Figure 8c: Resource map produced in workshop with men in Small Saw Mill

3.2 Customary land tenure and property rights

Statutory and customary land tenure systems co-exist in Liberia, as is the case in most African countries (Wily, 2007; Lomax, 2008; Toulmin, 2008). As Unruh (2009) notes, this duality is not problematic per se, but rather the limited recognition and connection between the systems causes a lack of clarity and is a potential source of conflict and grievance. Within the system of traditional customary law, the state recognises certain communal rights to land, but not others (Unruh, 2009). Bopolu district was formerly a single district in Lower Lofa county, which has a long established customary land deed, although the boundaries changed slightly when Gbarpolu county was formed under President Taylor, reducing the area of Bopolu district. Many participants confirmed that the original Bopolu district was 'deeded land' [land held under customary tenure], which comes under the control of the chief who has a communal deed ('Tribal Certificate'[1]) to tribal areas and who administers its distribution. The land in particular communities was regarded as belonging to the descendants of the elders who originally settled and established the town and who allocated the land to different family heads. As the population expanded, new areas of land were cleared and new farms established in agreement with the chief and elders of the community. The area of land farmed depended on the size of the household and labour requirements (Unruh, 2009).

The land participants used for shifting cultivation had not been surveyed for each family; some men estimated that they farmed approximately five acres of land; while in Totoquelleh, elders suggested that each large extended family (comprising 300 or more people, some of whom may live elsewhere in Liberia or abroad) may have use rights to 800-900 acres of land. The eldest male 'family head' was usually responsible for decision-making about any changes in land use: '*He cannot*

[1] Acquiring a 'Tribal Certificate' is only the first step towards obtaining a formal land deed.

do anything there without the old man approval. If the old man says no don't use the land this way, he will not do it. Because he's controlling all of them now'. Participants explained that family land was transferred from one generation to the next predominantly through patrilineal inheritance practices. While both sons and daughters could inherit land from their father, patrilocal marriage practices meant that women usually accessed land through their husband and their sons would inherit the land they farmed with their husband. In one town, however, a women's group had been allocated a large area of land by the chief, which they farmed collectively.

Use rights to land could be allocated to newcomers and migrants who would usually be attached to a host family. However, they would not be regarded as 'owners' of the land and would not be permitted to plant tree crops (referred to as 'life crops'), such as rubber, oil palm, cocoa etc. without agreement from local leaders. As one participant explained:

> *if you want to live here with us we can give a portion of land for farming, but that does not mean that you own that land. So a person cannot plant life crop on such land, like rubber, palm, cocoa etc. You can only plant like rice, vegetables, cassava etc.*

Tree crops are regarded as consolidating ownership of the land and customary deed holders and family heads feared that the planting of tree crops could be used as an attempt to claim the land, as has been found in other contexts in Liberia, Ghana and elsewhere (Unruh, 2009; Berry, 2009). Another participant commented that 'strangers' could be granted permission to plant tree crops, but such a granting of communal property rights and change of land use was dependent on the newcomer's social relations with community members and their commitment to the town:

> *All depends on how you live with us in the town. If you live here for more than 10 years, and been suffering for the town, by right they are supposed to give you spot. For example car road maintenance, bridge maintenance, payment of taxes, you doing everything, at least you are supposed to be given the go ahead to plant the life crop.[…] One cannot just come and start to plant life crops on the land; that would be overlooking the owners of the land.*

Intergenerational tensions were evident in one community between elders and youth about the allocation of land to an individual who was a former government representative. The elders had agreed to allocate several hundred acres of land to the individual without the consent of the youth. Some feared that this was part of a strategy to gain private ownership of communally held land which would then be leased to Sime Darby:

> *We the youth think that he is carrying on some strategy in favour of Sime Darby; we think he wants to get our land and lease portion to Sime Darby to plant the oil palm, so he can sell to them so they start thinking on the percentage, we look at it and said no our land belongs to us, let it stay as it is.*

Men and women reported that they had taken their complaint to the Representative and Senator, but the matter was unresolved at the time of the fieldwork. They expressed their frustrations that elders were not taking into account their views and not acting in accordance with customary land inheritance practices:

> *They are our old people, we cannot do anything to them, but they have to apologise to us.[…] We inherit the land from our old people after they have died, but now we see them giving the land*

> *up. This is surprising to us, because previous elders were not involved in this practice, but our present elders are engaging in this practice of giving land up without consulting the youth.*

Land conflicts were otherwise reported to be relatively uncommon.

3.3 Ecosystems services

Ecosystem services (section 2.1.2) were evaluated within each Landscape unit (Figure 6) based on two sources of information: local information from the focus groups (Section 2.3) and expert judgement. The evaluation and mapping provides a baseline of current conditions ('state of the environment') at a broad, landscape scale against which to, (i) measure the impact of future land clearance, and (ii) identify sites that may be suitable for palm oil where the impact of land clearance is predicted to be lower.

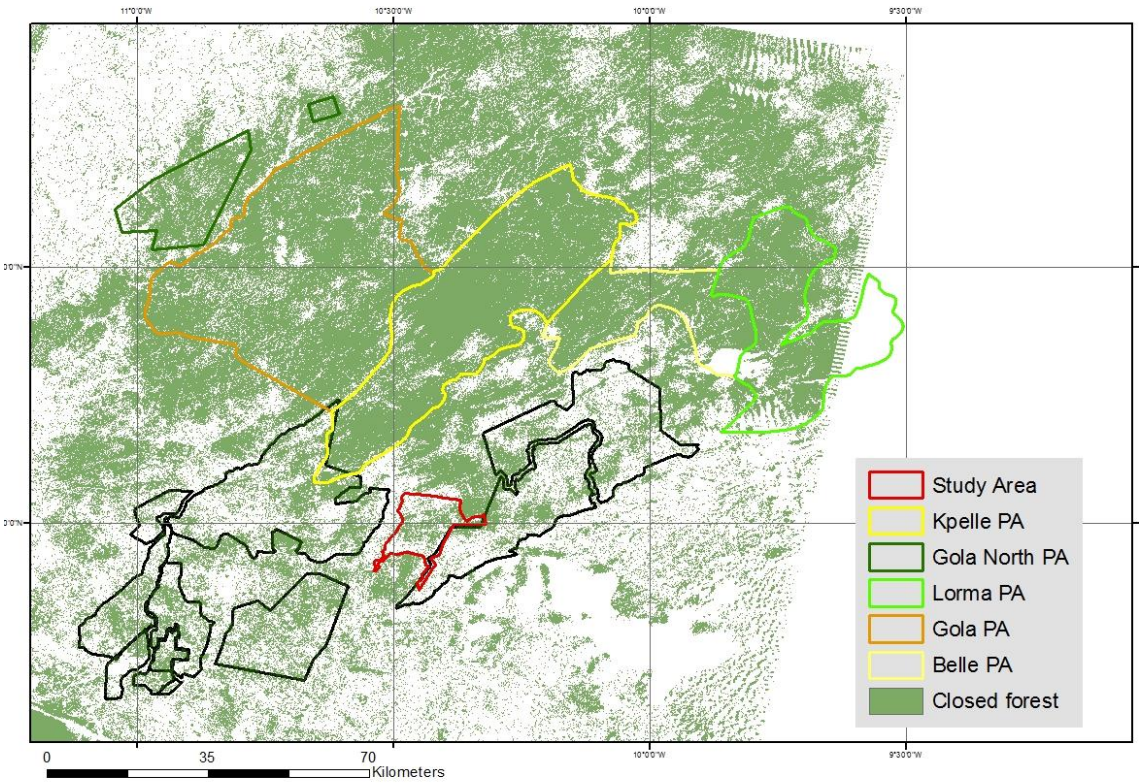
The meetings with local people during the first and second periods of fieldwork provided invaluable information about the different ways in which the local resource base was being used. This information was related specifically to different ecosystem services, namely *provisioning* (crop growth, the use of forest and non-forest products) and *cultural* services (sites of cultural significance, sense of identity) that tend to be *locally* relevant.

3.3.1 Biodiversity and Protected Status

The region falls with the Upper Guinea forest belt, a region of high diversity and endemism and considered to be a global biodiversity hotspot (Birdlife International, 2013). Liberia's forests constitute the largest remaining blocks (43 per cent) of the Upper Guinean Forest Ecosystem, making these forests a global hotspot for biodiversity. It is important to protect areas of extant Closed forest within this region given its global biodiversity significance.

The region is part of the extensive, extant forest of Upper Guinea that extends in a north-easterly direction between the two major rivers of the St Paul to the east and the Moa River on the border with Sierra Leone to the west. This is clearly shown from the classified Landsat ETM satellite image, classified into broad land cover classes. The classified image (Figure 9) shows Closed forest (dark green) extending northwards from the area of the concession (black line) towards the protected areas of Kpelle, Lorma, Gola and Belle, at their closest point only about 10km from the Study area.

Figure 9. Protected areas to the north of the Bopolu concession [source: UNEP WCMC Protected Planet; http://protectedplanet.net/about]



Obtaining data on the presence and distribution of species without extensive and time-consuming field survey is not possible, especially in a region of high biodiversity and limited access in the dense forest that characterises large parts of Liberia. However, some useful proxy measures are available, notably the Endemic Bird Areas (EBA). Bird Life International (2013) has identified regions of the world where the distributions of two or more restricted-range species (species with a range less than 50 000 km^2) overlap to form *Endemic Bird Areas*. Half of all restricted-range species are globally threatened or near-threatened and the other half are vulnerable to the loss or degradation of habitat owing to the small size of their ranges. The majority of EBAs are also important for the conservation of restricted-range species from other animal and plant groups. For example, there is an overlap of 70 per cent between the location of EBAs and areas which are similarly important for endemic plants globally. The unique landscapes where these species occur therefore, amounting to approximately 4.5 per cent of the earth's land surface, *are high priorities for broad-scale ecosystem conservation.*

The natural habitat in most EBAs (83%) is forest, especially tropical lowland forest and moist montane forest. Geographically, EBAs vary considerably in size, from a few square kilometres to more than 100,000 km^2, and in the numbers of restricted-range species that they support (from 2 to 80). The Upper Guinea EBA encompasses all of the Bopolu concession and most of the overall concession (Figure 10) and contains 15 restricted range bird species (Table 4).

Table 4. The names of the bird species included in the Upper Guinean EBA including their IUCN conservation category [source: Birdlife International, 2013].

Species	IUCN Category
White-breasted Guineafowl (*Agelastes meleagrides*)	VU
Rufous Fishing-owl (*Scotopelia ussheri*)	VU
Brown-cheeked Hornbill (*Bycanistes cylindricus*)	VU
Western Wattled Cuckooshrike (*Campephaga lobata*)	VU
White-necked Picathartes (*Picathartes gymnocephalus*)	VU
White-eyed Prinia (*Prinia leontica*)	VU
Sharpe's Apalis (*Apalis sharpii*)	LC
Liberian Greenbul (*Phyllastrephus leucolepis*)	CR
Green-tailed Bristlebill (*Bleda eximius*)	NT
Yellow-bearded Greenbul (*Criniger olivaceus*)	VU
Black-headed Rufous Warbler (*Bathmocercus cerviniventris*)	NT
Rufous-winged Illadopsis (*Illadopsis rufescens*)	NT
Copper-tailed Glossy-starling (*Lamprotornis cupreocauda*)	NT
Nimba Flycatcher (*Melaenornis annamarulae*)	VU
Gola Malimbe (*Malimbus ballmanni*)	EN

VU – vulnerable; **LC** – Least concern; **CR** - Critically endangered; **NT** – Near threatened; **EN** - Endangered.

Figure 10. The Upper Guinean Endemic Bird Area (grey area) [**source:** Birdlife International, 2013].

3.3.2 High Conservation Value Forest (HCVF)

To meet principle 9 of the Forest Stewardship Councils Principles and Criteria for responsible Forest Management, there is a need to determine if all or part of a forest area is High Conservation Value Forest (HCVF) (Table 5).

Table 5. The six High Conservation Values (HCVs)

HCV 1	Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia)
HCV 2	Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance
HCV 3	Forest areas that are in or contain rare, threatened or endangered ecosystems
HCV 4	Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control)
HCV 5	Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health)
HCV 6	Forest areas critical to local communities' traditional cultural identity (e.g. areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities)

The concept provides a useful schema for the classification of forests, determining the type of management and long-term monitoring required to maintain/enhance the forest and at what spatial scale. In practice, assigning forested areas into HCV categories is an expert job requiring extensive fieldwork and consultation with local communities. Nevertheless, the HCVF toolkit provides useful and important guidance and this was consulted, both in the field and subsequently, as a significant component of the evaluation of ecosystem services (ProForest, 2003).

3.3.3 Carbon Maps

The Study Area (Bopolu) is a relatively small proportion of the total area of the concession (c. 6 percent; Figure 1). However, from Landsat satellite imagery and field validation, about 40 percent of this total remains as Closed forest, albeit disturbed by sporadic logging (pit-saw operations) (Section 2.3.5, Table 2). This figure is close to the proportion of Closed forest within the whole concession (c. 42 percent). Both within the Study area and the whole of the Sime Darby concession, dense, Closed forest remains a significant proportion of the total land area. This is a potentially important carbon store with a high capacity for carbon sequestration, an important regulating function for the global carbon budget. The loss of remaining forest cover in Liberia would have potentially negative consequences for any future national system of carbon accounting as part of international obligations towards the development a low-carbon economy, for example REDD+ (Reducing Emissions from Deforestation and Forest Degradation).

This has prompted the need for improved information about the carbon store and sequestration capacity of natural ecosystems, a need that has resulted in rapid improvements in spatial information at a global level including the production of carbon maps, for example recently in Ghana (WCMC & UNEP). These maps, largely based on the interpretation of satellite imagery combined with field-derived allometric equations[2] enable land cover to be converted into estimates of above- & below-ground biomass.

According to Whitmore (1990) the above-ground biomass (AGB) of a typical tropical lowland primary forest is about 400 Mg ha^{-1}. However, the AGB may be considerably lower than this value as the values do not reflect the spatial heterogeneity of forest areas caused by differences in

[2] Equations that enable above and- below ground biomass to be estimated from standard tree measurements, principally diameter at breast height (dbh) for above-ground.

environmental factors and human impact. Logging or fragmentation for example, causes a marked loss of AGB due to an increase in tree mortality and tree damage near fragment margins. Lasco (2002) reviewed published data and derived from these a typical AGB loss through logging ranging from 22 to 67 per cent. A recent report by Golden Atlantic Resources (GAR, 2012) in Kalimantan, Indonesia in collaboration with Greenpeace and The Forest Trust (TFT) demonstrates a possible approach for mapping different forest/land cover categories in combination with fieldwork to assign an estimate of above-ground biomass to each forest category. Of critical significance is the assignment of a relatively low threshold (35 Mg/C/ha^{-1}) - above this value a forest type would be protected on the basis of its inherent and potential capacity to store and sequester carbon. Thus only 'Young scrub' and 'Cleared/open land' (in the context of this study) are included as below the threshold and therefore *suitable* for palm oil planting.

It was not possible in the present study without the opportunity for extensive fieldwork to estimate above-ground biomass for the different categories of forest cover mapped. Literature was consulted however, to determine expected values for humid tropical forest interspersed with slash and burn agriculture, typical of this part of West Africa. An extensive review of the evidence by Germer and Sauerborn (2008) demonstrates that forest conversion for oil palm on mineral soils typical of Bopolu, with and without burning, yields the values given in Table 6. The clear conclusion from the review is that palm oil plantations on degraded tropical grasslands yields a net benefit (reduction of greenhouse gas (GHG) emissions) but the *converse* is true for tropical forests with a net increase in GHG emissions of c. 650 (± 350) Mg ha^{-1}.

Table 6. Greenhouse gas balance in carbon dioxide equivalents (Mg ha^{-1}) for oil palm plantation establishment in forest on mineral soils [**source:** Germer and Sauerborn, 2008]. The data are presented for mineral soils, without and without burning of cleared timber.

	Land clearing	**Change in soil carbon or peat decomposition**	**Fixation in oil palm plantation biomass**	**Balance**
Forest conversion (zero burning) on mineral soil	627 ± 326	150 ± 75	–129 ± 40	647 ± 361
Forest conversion (burning) on mineral soil	648 ± 337	150 ± 75	–129 ± 40	668 ± 372

3.3.4 Evaluation of ecosystem services: data integration

The combination of local knowledge and expert judgement enabled a database to be developed, itemising and scoring the ecosystem services identified from field observations and meetings with local communities (Table 7).

Table 7. The combination of local knowledge and expert judgement to 'score' (1 – 5) each land cover class (Figure 9) according to the ecosystem service provided.

Land cover type	Carbon storage/ sequestration	Biodiversity	Bushmeat	Timber	NTP	Soil protection	Water quality	Flood mitigation	Spiritual sites	Identity/ belonging	Cultivated crops - local	Cultivated crops - export
Closed forest	5	5	5	5	5	5	5	5	5	5	1	1
Open forest	3	4	4	4	4	5	4	4	2	1	1	1
Mostly cropland	1	1	1	1	1	2	1	1	1	1	5	3
Swamps	4	3	3	2	3	1	3	4	1	1	3	1
1 Not significant 2 Some significance 3 Significant 4 Important 5 Very important			Closed forest: Open forest; Cultivated land; NTP: non-timber products.									

The scoring system is *relative*, providing a simple categorical assessment of ecosystem services provided by each land cover category. The ecosystem services provided by each of the different land cover types is discussed below.

Closed forest

Regulating: Closed forest plays a critically important role in the regulation of the global carbon budget (section 2.1.4). However, approximately half of the tropical biome globally is likely to be in some stage of recovery from past human disturbance, most of which is now secondary regrowth growing on agricultural lands and pastures. This is the typical situation within the Bopolu concession where it is unlikely that much of the remaining forest is 'primary' in the strict sense of never having been disturbed by logging/former cultivation. The field survey revealed large areas of forest containing a diverse range of species, however, including many timber-valuable individual trees and a forest cover characterised by emergent trees (>20m in height), a canopy, understory and forest floor layer typical of primary forest structure.

Work reviewed by Silver et al. (2000) shows that above-ground biomass (AGB) increases at a rate of 6.2 Mg/C/ha^{-1} over the first 20 years of regrowth and at an average rate of 2.9 Mg/C/ha^{-1}over the first 80 years of regrowth. This depends critically upon a range of complex factors including the diversity (complexity) of the ecosystem (Bunker et al., 2005), the density of woody cover and former land use, soil type, and elevation. Based on field observations including estimates of tree height, tree density and dbh (diameter at breast height), it is likely that the AGB of areas mapped as Closed forest in the Bopolu concession (Figure 5) in undisturbed conditions would be comparable to the typical values given by Whitmore (2000; Section 2.1.4). Certainly, even in areas of disturbance and fragmentation, the situation typical of Bopolu, it is likely that the AGB exceeds the minimum threshold of 35 Mg/C/ha $^{-1}$ suggested by the GAR study in Kalimantan (GAR, 2012; Section 2.1.4).

Closed forest also has an important role as a wind-break, protecting crops and houses from wind-blow at certain times of the year. This was mentioned frequently during the focus groups.

Provisioning: Closed forest is of critical importance as a source of bush meat. Interviews and focus groups with local communities provided clear evidence of the primary importance of bushmeat in the diet of local people. Anecdotal information suggested that bushmeat was more abundant during the civil war because of the relative depopulation of this part of Liberia and that with the return of people, the abundance of some species has declined, but remains important. Local people will travel considerable distances during the night to set and collect from traps, often up to three to four hours but sometimes for up to 12 hours from their home (section 3.1).

Closed forest is also important as a source of building material (pit saws), medicinal plants ('uncountable' numbers of potential plant species according to one local source during an interview at Lowomah on 27th June, 2012).

Supporting: Soil carbon accumulates at an estimated rate of 0.41 Mg/C/ha^{-1} in secondary regrowth (Silver at al, 2000), the rate depending upon the substrate and other environmental conditions. Soil forming processes are also critically important where forest cover reduces rates of erosion and allows for the accumulation of a protective layer of organic material, thus maintaining nutrient cycling and plant growth. The reduction in soil erosion and the increased infiltration/reduced evapotranspiration from cool, moist forest cover is vital for the continued replenishment of the aquifer and the availability of the supply of good quality water, either from wells (pumped and hand-drawn) or directly from streams/creeks. This was mentioned as important at all of the 10 settlements visited during the first fieldwork period and subsequently in focus groups during the second period of fieldwork.

Clean, sediment free water is also important for fish, an important source of food, mentioned at six of the 10 settlements visited and in the focus groups.

Cultural: during fieldwork, no specific instances were provided of important cultural sites within the forest, except where these adjoin settlements, although it is known that forests are important in this respect. Results from the focus groups demonstrated clearly however, the importance of the forest in creating a sense of identity, belonging and way of life.

Open forest

Open forest is defined as secondary regrowth following cultivation. In many cases and where abandonment has been relatively recent, there exists a complex mosaic of stands of secondary regrowth with recently abandoned cultivation. The regulating, provisioning, supporting and cultural services provided by Open forest were scored in the same relative rank order as for Closed forest, but with lower scores to reflect the reduced services provided by a generally fragmented and highly disturbed forest cover of generally lower AGB.

Cultivated land

Cultivated land is characterised by a mosaic of recently cleared land, standing crops and fallow.

Regulating: Generally low, reflecting the relatively low biomass, highly disturbed nature of this land cover type.

Provisioning: High, reflecting the critical importance of the main crops grown to support local populations, mostly on a subsistence basis but with some cash cropping. Crops include rice, cassava, plantain, sweet potatoes, beans, peppers (subsistence) and rubber, cocoa, and coffee (cash crops).

Supporting: Crops contribute toward soil protection but increased pressure on the fallow cycle may be resulting in a loss of soil fertility.

Cultural: Farmland was mentioned during the focus groups as being important for generating a sense of identity, contributing directly towards independence and food security.

Swampland

Regulating: there is some evidence that the rate of forest growth on continuously wetted soils is generally higher than for dry soils, thus contributing towards high rates of carbon sequestration. However, mapping Swampland from satellite imagery proved to be difficult given the spectral confusion with Open forest, although from field observation areas of Swampland are relatively *extensive.* There is a critical need to map the extent of this habitat, especially as it is likely to be important for biodiversity, as well as providing a range of provisioning services for local people. In this respect Swampland is often used as insurance against a poor harvest from other crops.

Provisioning: Swampland is critically important as a source of rattan for furniture making and, in some years, areas are cleared and planted for 'emergency' crops of rice during periods of shortage. Fish is also a significant food source from Swampland, highlighted during the focus groups.

Supporting: Swampland is potentially important for flood mitigation and water quality.

Cultural: Income from fishing is an important livelihood strategy, especially for women, as indicated in the focus groups. Women's income may enhance their autonomy in household decision-making and wider participation in society.

3.3.5 Mapping ecosystem services

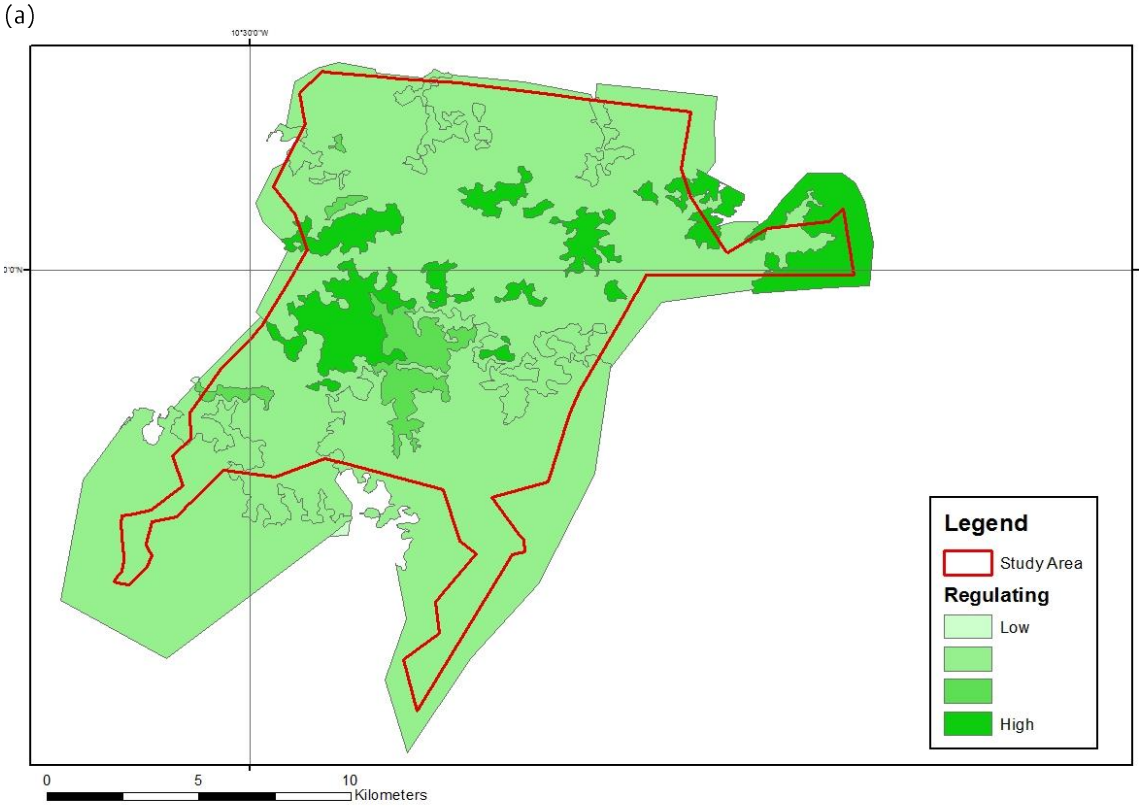
Typically, each Landscape unit contains a mosaic of land cover types in varying proportions. The Landscape units were therefore superimposed onto the classified Landsat satellite image of land cover and the *proportions* of the different land cover types within each unit estimated visually and multiplied by the scores for each ecosystem service by land cover class to produce four maps: Regulating, Provisioning, Supporting and Cultural (Figure 11). The maps are scales numerically (1 – 5) translated into:

1 – Minimal
2 – Low
3 – Medium
4 – High
5 – Very high

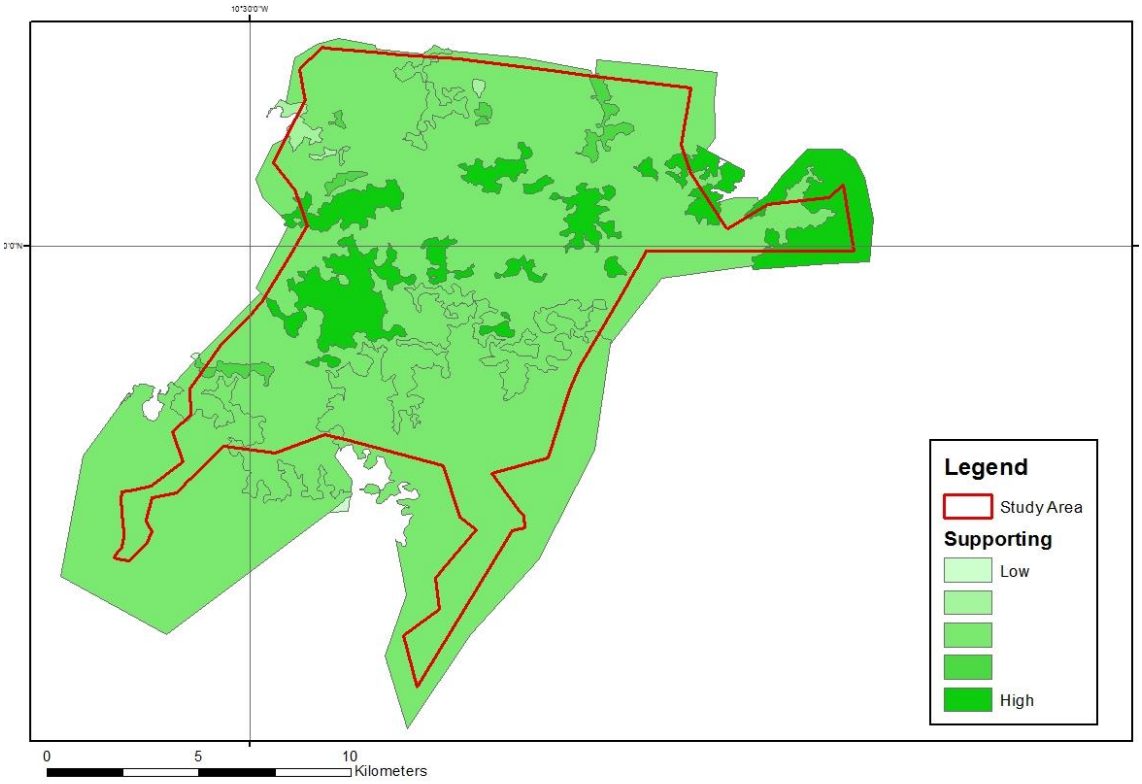
The maps show a contrasting picture depending upon the 'service' being mapped. However, the primary role of Closed forest on higher, steeply sloping land that is generally marginal for agriculture is depicted as 'high' or 'very high' in all four of the maps.

Figure 11. Maps of the four primary ecosystem services in the Bopolu concession: (a) Regulating; (b) Supporting; (c) Provisioning & (d) Cultural.

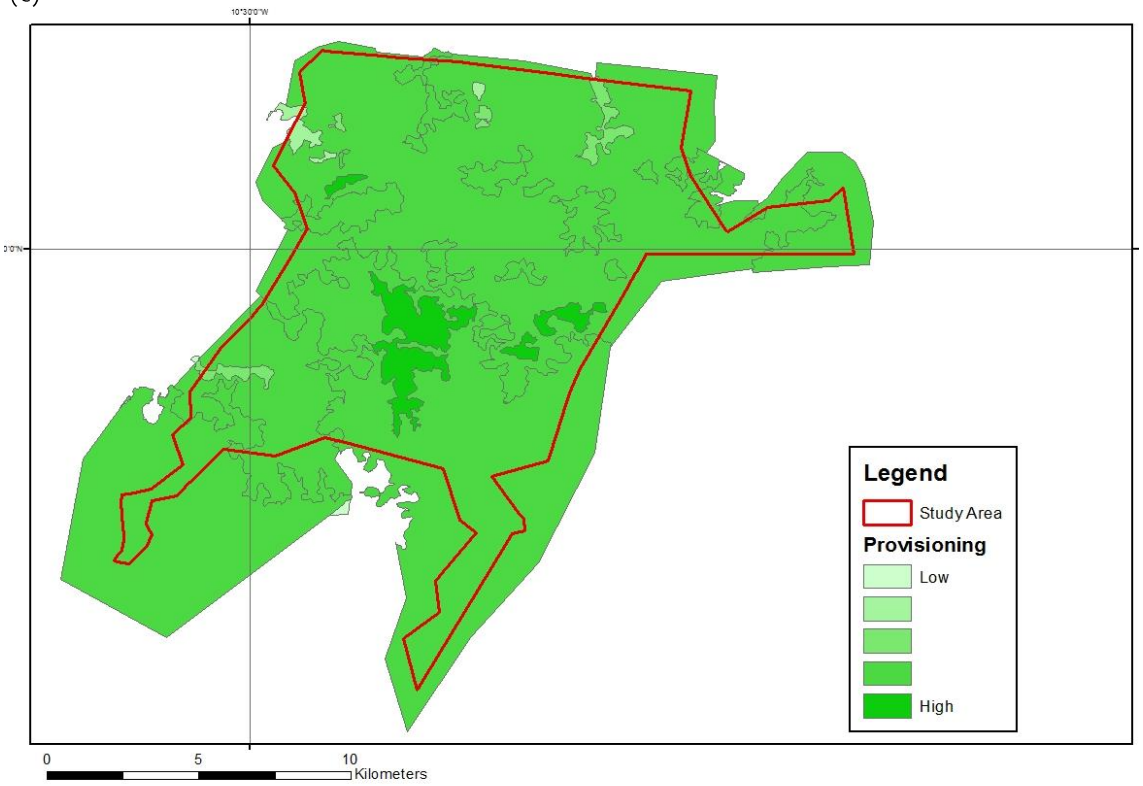
(a)



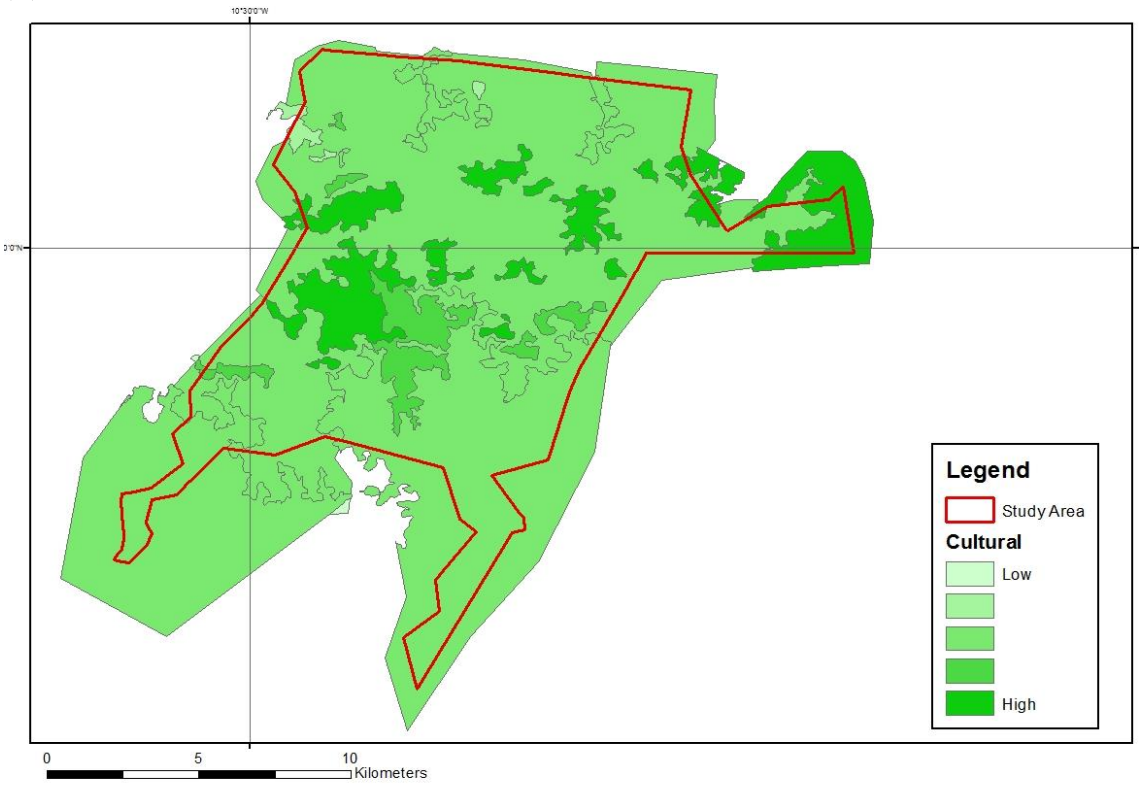
(b)



(c)



(d)



The maps of ecosystem services provide a baseline against which to evaluate the impact of the concession, particularly in vulnerable areas of high ecosystem service provision (section 3.6.5).

3.4 Community perceptions of the impacts of the palm oil concession on livelihoods and property rights

Following the mapping of current livelihoods, resource use and ecosystems services in the Bopolu concession, this section discusses participants' perceptions of the potential impacts of the change in land use to a large-scale palm oil plantation on local people's livelihoods and property rights. Resistance to the proposed plantation was expressed in two of the three research locations and community members could see very few, if any, benefits. Men, women and young people were very concerned about the impacts of the clearance of land and the resulting loss of farmland, forest and water resources on their livelihoods, food security and way of life, both in the present and for future generations. As one woman commented: *'When those people come here we will not have access to our own land! We will be slaves, even our own children from this town will not get place to sit down. So we don't agree*'.

Men and women whose livelihoods had depended on the land and natural resources that the forest provided for generations feared that they would no longer be able to farm, to fish, hunt and their children would not be able to inherit the land and continue their way of life in future. Land was perceived as integral to people's livelihoods, sense of belonging and cultural identity:

> *Our fear is when Sime Darby comes here we will not own our land any more. We will not own it no more! Then we will become strangers on our own land. We will not have place again to do anything, which will make life vulnerable. We will not have fishing area, we will not farm, our children will not [have a] place to establish themselves in the near future. That is our fear, that is the reason we say we don't want Sime Darby to come here.*

Older and young men and women highlighted how the loss of the forest and farmland would mean they were no longer able to grow food crops such as rice or to hunt bushmeat, which were their main sources of income and food, which they would otherwise struggle to buy:

> *if they come here and clear the bush, there will be no other area for us to go, so it will be difficult for us. Cup of rice now is LD 25 and LD 30 [equivalent to 0.34-0.54 US$] and some of us, we don't have the first five dollars to buy the cup of rice, that the only thing we can do to make farm and sustain our family, so we don't want for them to come.*

Men and women were particularly concerned about the loss of important tree crops such as rubber and cocoa plantations, which they feared would be uprooted. Participants commented that the 6 US$ price per rubber tree that they understood was the compensation price for destroyed crops was inadequate compensation if their land was cleared, since tree crops like rubber provided a sustained income over generations[3]. As CICR (2012) discuss, crop compensation cash payments only compensate for the price of one harvest for each tree or plant; rubber trees had been particularly undervalued, given that they constitute an important source of cash income for many subsistence farmers.

[3] Crop compensation for rubber was substantially re-valued at 97.92 US$ per tree in 2012 (Ministry of Agriculture, 2012), although community members did not appear to be aware of the revised prices at the time of the research.

Participants were also very concerned that their sources of drinking water and the creeks where they fish would be polluted, while the swamps which were used for rice cultivation would be filled with dirt. This may particularly affect older people's food security, as one older man commented:

> *this water here, we get fish from there to eat, sometimes when you are getting old you will not be able to farm the forest, but swamp [low land farming], when they fill all the swamps with dirt, then you will not be able to brush high bush. Like that we won't be able to get food.*

Several participants had visited the Sime Darby plantation in Grand Cape Mount county, while others had heard stories of how the plantation operated there, which informed their views. Research with affected communities where a plantation is already in operation appears to confirm anecdotal reports from participants. According to CICR (2012) communities encircled by plantation land reported an increase in food scarcity and swamplands previously used for rice cultivation were filled with dirt and palm seedlings were planted over them, leading to a shift in dietary habits from rice to cassava and other plants. Furthermore, company rules about fire hazards prohibited farmers from using the conventional slash-and-burn farming practices they rely on for food cultivation (CICR, 2012). NGO representatives confirmed the extent of changes brought about by large-scale land clearance and palm planting in Gawula district, Grand Cape Mount:

> *in Gawula, the people lost their livelihoods[...], they have lost their farm land, they have lost their hunting spots, they have lost their traditional attachments, their secret societies, they have lost their ancestors homes, where their fore fathers were buried, and so those experiences have taught us to move forward. [...] what has been done in Cape Mount cannot be undone, the land has been cleared.*

Workshop participants commented on their fear of losing communal property rights to tree products such as wild palm and other natural resources within the concession:

> *Our country palm [wild palm] is what we live on. We lived on it. Right now you can find it to harvest, but when the company comes and do their clearing, they will clear everything, we need to eat oil where will get oil from? The traps we now set to hunt animals, everything will be gone away, so how will we live? Only the big river, but all the creeks will be cover with soil, we see what is happening in Cape Mount...*

The loss of communal property rights to the land could result in the criminalisation of behaviour considered part of people's customary rights, such as using palm kernels from palm trees, as one woman pointed out. Such a loss of the ability to gather, produce and market local foods and products could impact particularly on women's livelihood strategies, reducing their financial resources and autonomy in decision-making within the household.

Some participants highlighted the loss of communal rights to other natural resources such as water and firewood within the concession, drawing on their experience of the company's operations in Grand Cape Mount:

> *I went inside the area where Sime Darby is operating in Cape Mount, I went there myself, I never saw any pumps installed by Sime Darby [...] I saw people drinking running water. Even places the people used to plant cassava are no more and the people are idle, to find firewood one has to travel two hours. If we allow these people to come here the same thing happening to people of Cape Mount will happen to us.*

Alongside the loss of/ pollution of natural resources, another participant commented on how he had seen that important community resources and cultural sites, such as the *Sande* bush and a community seed barn, had been destroyed in the land clearance. Furthermore, security measures that control plantation land as a gated surveillance area were reported to result in restrictions of movement that could reduce access to emergency healthcare. One woman whose daughter lived in the plantation area being developed in Grand Cape Mount, for example, reported that her pregnant daughter who was in labour had been forced to give birth in the car, '*because they refused to open the gate for them to pass*'.

These issues about access to basic services such as water and healthcare and communal property rights to natural resources raise the question of what rights are included or excluded with regard to concession holders. As Unruh (2009: 429) comments, while a concession is issued for the purpose of exploiting specific resources, such as timber, rubber, minerals, or agriculture, in practice, concessions have been used to 'pursue a very broad set of rights to claim and exploit land resources in whatever way suits the concession holder - although it may have little to do with the business proposal that was used to obtain the concession'. Several participants perceived the operations of a logging or mining companies as far more preferable than those of a palm oil company, since they exploited the specific resources they were interested in without '*destroying the land*'. In such a situation, land and natural resources would still be available for farming, prospecting or other livelihood strategies, while the agricultural concession appeared to provide broad, undefined rights to the land. As one participant explained:

> *if logging company comes, they will not get mineral from under the ground. They only take the tree they want, wood they want from the forest and carry then our forest remain. Then other group too will come which may want something from under the ground, then people that will be here will work to get some money, but if Sime Darby closes this whole thing, it will be hard for us. It means we will die; we will be in slavery, and we don't want to be in slavery anymore in Liberia.*

In participants' views, mining or logging did not threaten people's livelihoods and way of life to such an extent as agricultural concessions, which appeared to involve the complete loss of communities' communal property rights to the land and other natural resources. People living in communities affected by concessions who survive on these natural resources for their livelihoods and food security, often have little education and few resources they can draw on to challenge such violations of their rights.

In the research location where Sime Darby had employed some young men, participants perceived benefits of the proposed plantation regarding employment opportunities and improved infrastructure and basic services, such as building the road, better quality housing, a school and clinic. They thought that a health facility needed to be built in the centre of the town for it to be of benefit to the community and that everyone in the locality should be able to access it whether or not they worked for the company: '*I want it be for the whole people. You work, you don't work, oh but you, but just go to that clinic.*'

Both men and women in this location said they would welcome any job opportunities that were offered, although some were sceptical about the duration of employment contracts that the company would provide. Participants in the other locations expressed their concerns that employment would not be offered to everyone in the family and that it would be mainly young people who would benefit. Many were concerned that without education, the employment offered

by the company would be limited to insecure temporary wage labour, clearing land, weeding/spraying and harvesting, which would not necessarily provide a secure, sustainable income in future. Some young men who had received little education thought that, although they might obtain work clearing the land when the plantation was being developed, the company's own employees would be used when the palm was ready to be harvested. Furthermore, since all the animals they used to hunt and fish would have disappeared and they lacked farmland to grow food crops, they would need to use all of their wages to buy food:

> *If they gave me small money like 30 US$, I go change it, I buy fish, I buy rice. Everything [animals, fish etc] gone from me so it will affect me because I did not go to school to learn, to be in car or to learn trade so it will affect me.*

Many participants in two of the communities said that they would not be interested in working for a company when they were used to working as farmers on their own land, as one woman commented: '*We wouldn't want Sime Darby jobs at all. Their jobs would make us old quicker. The job we love is farming and that is the job we are used to doing*'. Working for a company was perceived as threatening subsistence farmers' autonomy and sense of security: '*...people don't like to be controlled, especially for people who like working in the village. You want me 6 o'clock to wake up to go on the plantation, get in the tractor, I don't even know whether the money you paying me will sustain me...*' Older people in particular considered that they were too old and lacked the strength to work on a commercial plantation. They articulated a sense of hopelessness about the future if their land was taken away and there was no land or livelihoods for their children to come back to following their studies or if they had migrated abroad and decided to return to Liberia.

Some participants expressed their pride as citizens of the historic Bopolu 'deeded' district, which was '*older than Liberia*', and felt a sense of injustice if they were forced to relocate to another part of Liberia where they might be resented by others. NGO representatives also highlighted the risk of exacerbating conflict dynamics if people lost their farmland and were forced to request new areas of land where they could live and farm in other towns and communities in the concession. The risk of conflict and grievance caused by competing community land rights and government mandated concessions, alongside wider inequalities in land and property, lack of clarity in legal pluralism and a non-inclusive legal system are important issues that need to be addressed in the post-war socio-political environment in Liberia (Unruh, 2009).

3.5 Community consultation

As noted in Section 1.2, 'Free, Prior and Informed Consent' (FPIC) is regarded as a key principle in international law and jurisprudence related to indigenous peoples and has been endorsed by the RSPO as a key principle in its Principles and Criteria. In the workshops, participants reported that some meetings had been held in their community to provide information about the proposed development by representatives of Sime Darby and the Land Commission and other local authorities. In addition, some men had gained information about some aspects of the planned development, such as the length of the lease, through pamphlets and other awareness-raising activities of NGOs who came to talk to community members. Few women or young people participating in the research, however, had attended any meetings about the proposed development.

Despite the meetings that had taken place, participants in all the workshops had received little information about or were unaware of the details of the contract, resettlement or compensation

plans. Many participants expressed anger and frustration with government representatives about the lack of consultation about the contract and negotiations over the proposed development, as men in different research locations commented:

> *People that we sent as representatives did big blunder, they came they never consulted with us that was the plan then they went and signed those documents, whereby we find out that some of those documents can relocate this town. This is one of the historical towns, why must it be so?*

> *We told them to bring the contract between the government and the citizens. They don't want to bring the contract. How will you come to the people without bringing the contract, that is the place the problem is?*

A representative of the Land Commission acknowledged that there had been no consultation with local communities about the concession prior to the company starting operations. He explained that local people's consent was needed before the company could operate there since the majority of the land in Bopolu district was held under customary tenure (referred to as customary 'deeded land'): '*they [the company]have to get clearance from the local people and that clearance should have been guided by the government before allowing the people to go there*'. Following protests by local people and contractors in 2011, President Johnson-Sirleaf acknowledged that mistakes had been made (CICR, 2012). Frustration was expressed by the interviewee that the Land Commission was called on to resolve potential land disputes when they had often not been involved in the original negotiation process with investors and existing land use was often not taken into account.

Some community members thought that the limited consultation with communities was due to the financial benefits that government and local officials would gain from the development: '*They didn't involve us inside. They left us and did their thing because they wanted money in their pockets. That's what they did*'. Community members said that local disenchantment with county- and district-level representatives had resulted in them being voted out of office at the last elections.
Participants in two communities were distrustful of plans shared in meetings to improve infrastructure and basic services in local communities, such as building a school, drawing on anecdotal accounts of operations in Grand Cape Mount.

Young men who had been employed by Sime Darby for initial 'under brushing' (manual slashing of undergrowth) near the road in one research location expected to be employed again before planting began, although they did not know when the company would return. Participants in this research location reported that meetings with representatives of Sime Darby had been held in the community to discuss the development, jobs and building the road, a school and clinic, as well as the Outgrower scheme to provide seeds and advice to farmers about planting oil palm on their land and selling the harvest to the company. Residents attending the meeting had been asked to indicate with a show of hands their approval for the company to go ahead. Women participating in the workshop reported that the majority of residents agreed that the company could go ahead. However, men said that they had not seen the contract and they were not aware of any plans for compensation for the loss of land and property. Participants were hesitant about giving their views about the planned development without elders' consent, but considered that if the elder who held the land deed agreed, the town would give their approval for the company to proceed.

Some strategic interviewees saw lack of political will, fear of challenging government officials and others in positions of authority, weak institutions and ineffective legal implementation as the main challenges hindering the involvement of local communities in negotiations with government and

investors. As one interviewee commented: '*politicians have started to manipulate these chiefs, and put them at the head of the people and then the chiefs are making decisions on behalf of the people without consultations*'. Local officials interviewed (including a clan chief and district commissioner) were reluctant to discuss the proposed development and reported that they had no knowledge of plans for the plantation, the concession agreement or any resettlement plans, and had not been approached to discuss these issues.

The limited consultation and information about the proposed development reported by community members and local leaders calls into question whether the principle of Free, Prior and Informed Consent has been observed to date regarding the proposed development in the study locations. NGO accounts of an independent review of the process of Free, Prior and Informed Consent (FPIC) commissioned by Sime Darby suggest, however, that efforts are being made to ensure FPIC is carried out effectively with affected communities in Grand Cape Mount County and other areas of the concession.

3.6 Mitigating negative impacts and enhancing positive impacts

3.6.1 Displacement, resettlement and compensation

The concession agreement between Sime Darby Plantation (Liberia) Inc and the Government of Liberia provides that Sime Darby may, by notice to the government, request that certain settlements be relocated, if the investor can demonstrate to government that such a settlement and its inhabitants would impede development in the project area (GreenCons, 2011). The concession agreement provides for compensation to mitigate the loss or impact to property. GreenCons (2011: 116) note that according to international best practices, the compensation strategy and all aspects of resettlement should be 'a consultative and participatory process through which affected people are consulted properly and choose for themselves from among acceptable and clearly defined alternatives'.

CICR (2012) state that the Sime Darby contract mandates the creation of three funds which could potentially be used to compensate for the social impacts of its operations: 'Oil Palm Development Fund'; 'Rubber Development Fund'; 'Community Development Contribution'. According to CICR (2012), although the first fund will not receive any contributions until the palm trees become productive in the next three to five years, contributions should have already been made to the latter two funds. The researchers comment: 'Company representatives were unable to provide researchers with information on contributions to the two funds, and there is no mechanism to ensure that development projects are funded in areas where the livelihoods of farmers have been significantly impacted' (CICR, 2012: 39).

As noted in Section 3.5, workshop participants were not aware of any resettlement plans; to their knowledge, these issues had not been discussed in any of the meetings held with affected communities by representatives of Sime Darby, government officials or local leaders. Furthermore, when representatives of the government Ministries responsible for establishing a 'Resettlement Committee' were interviewed, very little information was provided about plans for resettlement or compensation. Given the potential scale of loss of communally held land in Bopolu district, there is an urgent need to develop appropriate resettlement and compensation plans with the full participation of community members of different genders and generations in the affected communities.

3.6.2 Employment

As discussed in Section 3.4, participants in one research location welcomed the potential job opportunities that would be provided by the proposed development. Participants in other locations were more apprehensive about, or were resistant to, employment opportunities that might be offered. Drawing on knowledge of the available jobs offered by Sime Darby in Grand Cape Mount, NGO staff considered that the prospects for secure, long-term employment for local people would be limited. They thought that insecure, unskilled jobs, such as weeding the plantation, would mainly attract young men. In taking up such short-term job opportunities, they would miss out on longer term education and training opportunities that could offer a more sustained income for themselves and their families in future. Representatives of government ministries also thought that young people would benefit most from unskilled job opportunities, while those with skills such as carpentry and masonry living in towns in the concession would also benefit; meanwhile subsistence farmers, particularly older people, would be most disadvantaged. NGO staff reported that although workers may earn 125 US$ per month, they pay income and social security taxes and the company usually deducts money for bags of rice at a discounted price, reducing the overall cash income workers receive. Reliance on limited wage employment, alongside the irreversible loss of farming and other livelihood opportunities they formerly relied on, reduces local people's ability to sustain their families in the future.

One community member thought that if the company was operating in the area, they should also build an oil palm processing factory, as this might enable more local people to benefit from employment, as well as enabling those who lived downstream to use waste water containing oil to produce palm oil for sale in local markets. Sime Darby's long term plan to establish an oil palm mill is noted by GreenCons (2011); this is seen as 'adding value to the industry and creating job opportunities', as part of the attempt to 'address issues of income generation and poverty reduction in Liberia' (p.18). However, little information was available about any such plans from Ministry representatives interviewed.

3.6.3 Outgrower programme

As part of the concession agreement, a Liberian small-holder Outgrower programme to support local oil palm farming on an area of 44,000 hectares is proposed (GreenCons, 2011). CICR (2012) note, however, that no farmers in the counties where Sime Darby is already operating had been incorporated into such a programme by early 2012. Neither the government nor the company had invested in the creation of the programme, despite a provision in the concession agreement that requires its establishment within three years of the signing date (CICR, 2012). A Ministry of Internal Affairs representative interviewed reported that an Outgrower programme had been suggested to Sime Darby at the time of the interview, but that it had not yet been developed in Grand Cape Mount or elsewhere.

Male participants who were aware of the proposed Outgrower programme were generally positive about planting palm oil on a portion of their land and selling it to the company, since this would enable farmers to keep control of their land and benefit in terms of providing an additional source of income: *'if they do come, we must tell them yes, this our land, but you can't be the boss for this land, plant the oil palm on portion of my land, time for harvest, I will harvest so you can cut your percentage. That is improving our living.'* Community participants emphasised that farmers should retain their land and ownership of the products of their labour: *'Sime Darby should help the community people and they work on the farm, own the farms, and sell the products from that farm to Sime Darby. It should not be Sime Darby selling the products'.*

Participants also highlighted the long term implications of growing oil palm for food security and the agricultural productivity of the land, since it is difficult to grow food crops on land that has been used to grow oil palm. They expressed their preference for growing rubber, since food crops could be grown more easily following the removal of rubber trees. This highlights the importance of farmers being able to decide on the area of their farmland they wish to allocate to palm oil cultivation to ensure their needs for food crops are met. As CICR (2012) comments, the 44,000 hectares allocated for the Outgrower programme within the concession agreement should not be seen as a single tract of land, but rather farmers should be able to cultivate palm trees along with other food crops in areas adjacent to their residences. This would enable local communities to continue to cultivate food while allowing the company to purchase palm products from farmers once the trees become productive (CICR, 2012).

3.6.4 Buffer zones

In one workshop, men expressed dissatisfaction with the extent of the land area in the county allocated to the concession and thought that the negative impacts of the proposed development could be mitigated if the company used a smaller part of the county. Some community members and strategic interviewees commented that company plans to allocate a reported 500 feet around each town for local communities' farmland was insufficient. Some interviewees saw this as part of the government's and company's approach not to be seen to evict and forcibly displace people, but to implicitly encourage people to leave the community voluntarily:

> *they say they give the town 500 feet to farm, and town like 3000 to 4000 thousand persons, you leave like 500 feet, what is 500 feet? So what they are doing to the town is, they don't care whether you move or not they don't care for your relocation, but you can move out if you want to [...] 500 feet cannot take care of us as a family, so that is the kind of strategy they are using.*

No information was available from a representative of the Ministry of Internal Affairs about the potential buffer zone distance around each town that would be allocated for farmland or how this area would be determined.

Men in the research location where the company had set up an initial camp appeared to have been told that the palm plantation would be located at least one hour's distance away from the town: '*They will not plant the palm around the town, the bush that they will leave near the town we talk about, the one hour distance. That where we will make our farm*'. Participants emphasised the importance of leaving adequate distance for farmland for local communities. Some were particularly concerned that if the plantation was located near the town, farmers would be forced to farm much further away from the town (two to three hours walk) which, without a road to people's farms, would restrict their access to markets for their produce, as well as restricting their access to basic services such as health and education.

As Section 3.1 shows, participants draw on natural resources from a far larger area of land for their livelihoods than merely the area surrounding their settlement. Based on the results from the focus groups it is clear that members of the community usually walked between 45 minutes to one hour to tend their farms, although some walked for up to two hours. Hunting for bushmeat is undertaken over a much larger area, men typically walking two to three hours into the forest to set and collect from traps. This information needs to be taken into account when developing plans for buffer zones to enable local communities to continue to practice food and cash crop cultivation on their communally held land.

3.6.5 Environmental buffers

The information about resource use collected from all the communities visited during the two periods of fieldwork but specifically from the focus groups in the three communities, can be translated into a final map indicating areas that should be maintained under current land use if the current livelihoods of each community within the concession are to be maintained.

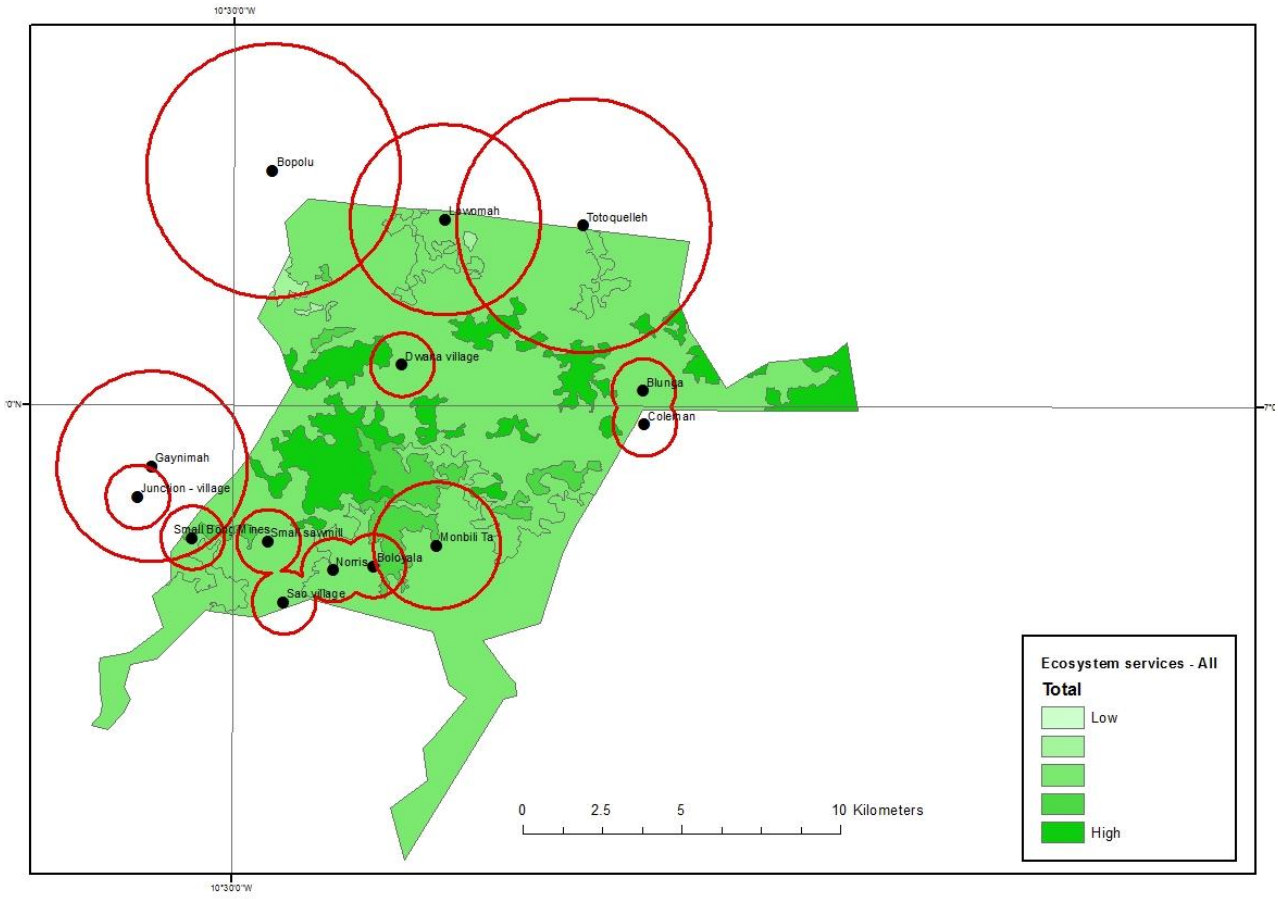
Information from the focus groups indicated that local people are prepared to walk for up to an hour (often further) to tend crops, equivalent to about 3km distance. Whilst not all of this land is cultivated at any one time, it is a significant part of the bush-fallow system practiced in this region. It is acknowledged however, that settlements with smaller populations will need access to less land and for this reason a *variable buffer distance* was used based on estimates (from fieldwork) of the population of each settlement within and close to the concession:

Population	**Buffer distance**
➢ 3000	4km
➢ 1000 – 3000	3km
➢ 500 – 1000	2km
➢ < 500	1km

The map of buffered settlements is shown in Figure 12 which also includes a map of the combined ecosystem services[4], i.e. supporting, regulating, provisioning and cultural (Figure 11). A substantial area of the concession is either within the estimated critical buffer distance of a settlement **or** intersects areas of significant (medium/high) ecosystem services (Figure 12). It should be noted however, that the satellite imagery (October 2010) indicates areas of cultivation *outside the buffered distances* shown on Figure 12.

[4] A simple linear sum of the individual ecosystem services, with no variable weightings applied.

Figure 12. Buffered distances around settlements superimposed onto the mapping of ecosystem services combined.



3.6.6 Renegotiation of the contract

As discussed in Section 3.5, community members expressed considerable frustration at the limited of consultation over the concession agreement. They were also concerned about the length of the lease (63 years). Some participants perceived that the only way to mitigate the negative impacts of the development was to renegotiate the concession agreement with the full participation of local communities. As one participant commented:

> *All our land has one deed, Bopolu District, all our land has been surveyed. If Government wants to give some of our land to Sime Darby, we must sit down, dialogue and reach an agreement. Whatever agreement Sime Darby and Government have reached must be in our interest, that is the only way we and Sime Darby work together in Bopolu District. [...] That is the only way we will be satisfied, besides that no way.*

Participants wanted their government representative and senator to request that the Government revised the contract to reduce the length of the lease. They were also very concerned that the concession agreement ignored their communal land rights and after the 63 years lease ended, their land would simply be regarded as belonging to the government. Such concerns reveal the tensions and potential grievances caused by the lack of clarity about community land rights, statutory law and land tenure policy in Liberia.

In addition, Ministry representatives highlighted the problem of limited capacity, specialist knowledge and expertise about different sectors, a lack of data about land use, as well as limited co-ordination between government Ministries and other institutions which hindered the negotiation of effective foreign direct investment contracts, concession agreements and resettlement and compensation schemes with large investors.

While a reduction in the length of the lease could potentially reduce some of the negative social impacts of the proposed development if communities were able to regain access to their communal lands, this would not necessarily reduce concerns about food insecurity and longer term environmental impacts. As noted in Section 3.4, large-scale oil palm cultivation may have major impacts on water resources, soil nutrients and land productivity. Thus, even if the length of the lease was reduced, it would be difficult for farmers to intercrop food crops with oil palm trees as part of an Outgrower scheme or use land formerly used for large-scale palm plantations for growing food crops to the same level of productivity as when they practiced conventional slash-and-burn cultivation.

3.6.7 Other strategies to safeguard customary land rights

Many participants considered that the main means of seeking to secure their customary land rights was to express their dissatisfaction and opposition to the planned development to government representatives and senators and work with NGOs and others to seek to ensure that government officials involved local communities in decision-making processes. Civil society organisations saw their role as to work with communities to share information, advocate on their behalf and lobby government to survey and clarify the areas of land that could be developed with minimal environmental and social impacts, to seek to renegotiate the terms of the contract and to develop the Outgrower programme.

Civil society organisations also considered it important to work with communities to input into national and international policies and forums to develop a formal process of 'Free, Prior, Informed Consent', to achieve effective implementation of relevant newly reformed laws such as the National Forestry Reform Law for Liberia and the Community Rights Law, and to develop and strengthen legal protection mechanisms for communities when contracts are negotiated and when seeking legal redress when rights are violated. Alongside greater political will, they saw community cohesion and mobilisation as key to achieving change: '*the major challenges [are the] lack of political will and then I would say, the loose or non-cohesive community relations. Because in communities where people are organized, the community will stand up and say we are not going for this*'.

Some community members saw investing in tree crops such as rubber as a key strategy to consolidate their property rights and protect their land for future generations, as well as providing an important source of income. As discussed in section 3.2, tree crops are often viewed as individual property that could be used as evidence supporting a more permanent claim to the land in question (Unruh, 2009). One woman identified this strategy: '*If we plant rubber, because nobody will be able to take it from us, because we have our crops on it*'. Similarly, one young man who had planted 4000 rubber trees saw this as a key strategy to secure the land and a sustainable income for his children: '*to develop my land because, now, now, the way I like this, I planting my rubber, I leave it with my children them, that one I can live on it and get good money*'.

Many participants, especially women and young people, emphasised the importance of education and vocational training to enable young people to develop more diverse, sustainable livelihoods in future. They saw the government as responsible for improving access to education and training and that this would bring 'good development' to their community. Improved infrastructure such as safe

drinking water, access to healthcare, and good roads to improve access to markets were also seen as important priorities for the future.

3.7 Green Consultants Environmental and Social Impact Assessment

The GreenCons Inc assessment of the socio-economic impacts was based on a structured survey of 53 participants (31 male, 22 female) from nine communities in Gbarpolu county and a series of 'public hearings' in 14 affected communities. With the exception of Totoquelleh and Lowoma, only between one and three men and women were questioned for the survey in each community, limiting the generalization of the findings. The report provides brief records of the 'public hearings'/ 'community consultation meetings' held by GreenCons representatives in 14 selected affected project communities in early 2011. Concerns were raised about: the loss of farmland and forest resources; whether employment would be available to skilled and unskilled workers; how older people would benefit; what would happen after the 63 year lease ended; and the need for basic services and infrastructure such as hand pumps for safe drinking water, adequate health care facilities, schools, roads and access to markets. While some of the 'recommendations' listed appear to respond to these concerns, more fundamental issues and questions, for example, about the loss of farmland and forest resources and the lease, are not referred to in the meeting records or in the overall report recommendations.

GreenCons (2011) acknowledge that given the nature of the proposed development and supporting infrastructure, it is 'highly likely for the resettlement of a number of communities and people from the project area to occur' (p.73). The report also states that 'the impact of the project on local communities as a result of displacement is considered to be highly significant' and that 'mitigation measures in the form of resettlement and compensation strategies will be required' (GreenCons, 2011: 73). These mitigation measures are not outlined in the report.
Regarding employment, which is seen as a key mechanism for mitigating some of the negative impacts of the development, the GreenCons (2011) report acknowledges that farmers from local communities may not want to be employed as plantation labourers and that the development may lead to the in-migration of workers (often young, single men with few local connections) from other parts of Liberia or from other countries. This may result in demands on basic services and infrastructure, as well as the risk of increased levels of crime, drug trading and use, increased sexual networking and sexually transmitted infections, squatter problems and so on, which may 'create an atmosphere of fear and distrust with the local communities' (GreenCons, 2011: 74). The report does not outline how these potential negative social impacts can be mitigated.

The GreenCons report also comments that employment opportunities provided may change the traditional division of labour between men and women in communities in close proximity to the site and will lead to a shift from traditional farming and food gathering practices to dependence on wage labour to provide for families. The implication is that if more men are employed than women and women's income earning opportunities are reduced, families may become more dependent on men's wages than formerly, which could exacerbate gender inequalities and have implications for long term development and poverty alleviation in the region. The report notes that the plantation may also result in negative changes in diet and higher food prices, with the risk of causing malnutrition among women and children, 'especially if the costs of food become prohibitive due to higher salaries of project employees' (GreenCons Inc, 2011: 80). It is unclear how these potential impacts would be mitigated and these problems identified are not referred to in the report recommendations.

4. Conclusion

This study has provided an in-depth mapping of current resource use, livelihoods and ecosystems services, in addition to analysis of community consultation and perceptions of the potential future impacts of the proposed Bopolu palm oil concession in Gbarpolu County, Liberia. The research reveals that land and forest resources were crucial to people's livelihoods, food security, sense of belonging and cultural identity in the present and in the future in rural communities, as has been found in other African countries (Lenz, 2007). Tree crops were regarded as consolidating ownership of land, confirming the findings of other studies (Unruh, 2009; Berry, 2009). The 63-year concession lease which allocated customary 'deeded' land for the development of a large-scale palm oil plantation was regarded by many community members as infringing their customary land rights and alienating the land and natural resources they depended on.

This research has highlighted some of the potential risks of large-scale agricultural concessions in Liberia and other African contexts. The most salient potential risks of the Bopolu palm oil concession identified include:

- loss of livelihoods, food insecurity and potential for chronic poverty
- loss of customary rights to land and forest resources and access to cultural sites, threat to identity and place-based sense of belonging
- growing marginalisation of vulnerable groups and increased gendered and generational inequalities
- conflicts over land and resources, displacement of rural communities and rural-urban migration
- restricted mobility and reduced access to basic services due to security measures on plantation land
- pollution of water sources and reduced access to safe drinking water
- potential loss of biodiversity, particularly the Upper Guinean Forest Ecosystem, which includes globally endangered and vulnerable bird species in the Upper Guinean Endemic Bird Area
- land clearance of substantial areas of Closed forest and the resulting reduction in current carbon storage and future sequestration capacity.

Although community perceptions did not differ significantly according to gender and age, the research suggests that the concession is likely to have some differential effects on different social groups. Young men and migrant labourers are most likely to benefit from unskilled work opportunities, while men and women engaging in small business activities may benefit from workers' increased spending power in the towns located in or near the concession. The concession may reinforce existing social inequalities in local communities. Men and women who are small-holder farmers with little education are likely to be most disadvantaged and vulnerable groups such as older people, women and children are at particular risk of chronic poverty, food insecurity and malnutrition. Reduced access to land and income-earning opportunities from the sale of food crops, vegetables and fruit, fishing, local palm oil production and bushmeat may particularly affect women's livelihoods, potentially leading to increased dependence on male wage labour and reduced autonomy in household decision-making. Research from many countries has shown that

reductions in women's income, control of assets and resources and decision-making autonomy may have negative impacts on investments in children's health, nutrition and schooling, increasing the likelihood that poverty will also be experienced by the next generation (Quisumbing, 2007; Kabeer, 2000).

Some participants recognised the potential benefits of improved physical and social infrastructure that may accompany the company's investment in the region, such as roads, schools and health clinics, better quality housing and employment opportunities. Participants emphasised that basic services and facilities should be available to all residents, rather than only to company employees. They also identified the importance of ensuring appropriate routes through the plantation to ensure community members' access to healthcare, drinking water, education and other basic services, in addition to ensuring that access to markets and transport was not restricted.

The research highlights the importance of ensuring that employment opportunities, paid in accordance with national minimum standards and with adequate protection and security of contract, are available for men and women from diverse age groups who have a range of educational backgrounds and skills. Community members, particularly young people, identified the need for training programmes where appropriate to ensure that residents of affected communities benefited from such employment opportunities. The research suggests that the establishment of an Outgrower programme, an oil palm mill and/or the promotion of other non-farm/ non-forest livelihood opportunities could provide important alternative livelihood strategies within affected communities. Community members particularly welcomed an Outgrower programme if this enabled farmers to cultivate palm trees alongside their other food and cash crops on land adjacent to their homes and enabled them to sell their produce once the trees became productive.

Community members participating in the research expressed frustration with the limited consultation with affected communities and wanted the length of the lease and land area allocated to the concession to be re-considered, taking into account local communities' customary land rights, current resource use and future land use priorities. This research has revealed the importance of ensuring the free, prior and informed consent of affected community members, including women, youth, older people, migrants and newcomers, in addition to men, community elders and representatives of local authorities, before operations start in affected communities[5]. As part of this process, the research highlighted the importance of appropriate resettlement and compensation plans being developed with community members, informed by nationally agreed standards (for example, crop compensation prices) and internationally agreed principles (such as the Roundtable on Sustainable Palm Oil Principles), in accordance with the UN Declaration on the Rights of Indigenous Peoples (2007) and other UN human rights conventions.

The landscape approach provided a useful spatial framework for the assessment of ecosystem services. The participatory mapping workshops with groups of men, women and young people provided in-depth insights into livelihoods, food security and customary land rights and perceptions of how these would be affected by the proposed concession. Further work is required to refine this approach based upon additional meetings and research with a wide cross-section of people within each of the potentially affected communities to determine their priorities for future land use, especially in relation to cultural sites and customary land rights. The research indicates that local people have a precise knowledge of their customary land rights (only a small proportion of the land within the concession is held in private deeds) and the natural and community resources which are

[5] NGO representatives reported that, at the time of writing, The Forest Trust (TFT) was seeking to ensure that the principles of Free, Prior and Informed Consent were adhered to in Grand Cape Mount County.

important for their cultural identity, livelihoods and food security both in the present and for future generations.

The research reveals the need for accurate surveying of the land and community resource use (including customary land rights) within the study area and the wider concession. This would enable the identification of potential areas that are suitable for palm oil with minimal environmental, social and economic impacts. Surveying of ecosystems services and customary land rights and resource use should be used to establish buffer zones around settlements and areas of Closed forest and high ecosystem service provision. A variable buffer distance around settlements of different population size was used to ensure that each community continues to have access to their farms and other natural resources. A programme of surveying should be linked to a programme of intensive fieldwork to develop an improved spatial framework of landscape units across the whole concession. This would enable more accurate information on land cover and resource use to be integrated within a comprehensive assessment of ecosystem services at landscape scales.

4.1Limitations

A number of limitations are evident, in relation to data sources and the extent of the fieldwork that was possible within the available research time:

- The most recent good quality (cloud-free) Landsat TM imagery was only available for October 2010: further analysis is required to update this mapping with more recent imagery across the whole concession, with validation of land cover classes from field visits.
- Additional detailed information on soil type (texture, pH, organic content, trace minerals etc.) is essential to develop a more refined landscape framework and to identify land that is highly suitable for cultivation for subsistence crops and other land that is more suited to palm oil. This information should be combined, if possible, with data on slope steepness to ensure that steep slopes are avoided for palm oil, given the known difficulty of effective terracing in areas of very high rainfall.
- The time available for fieldwork for the environmental assessment was restricted to five days, insufficient to conduct a detailed ecological survey of species and habitats.
- The time available for fieldwork for the social assessment was also limited to five days, which restricted the sample of community members and strategic stakeholders who could be recruited. In addition, some participants, particularly strategic stakeholders, were reluctant to express their views and provide information about the proposed concession and how it would affect local communities. Questionnaires, interviews and focus groups with a larger number of participants, including those already affected by the development in Grand Cape Mount County, would have provided a more representative sample and enabled a more comprehensive analysis of the potential socio-economic impacts across the concession.

4.2 Wider policy implications

This case study of a palm oil concession in Gbarpolu County, Liberia has highlighted a range of wider policy considerations regarding land acquisition processes and interactions between international investors, government and local communities in the global South:

- Formal mechanisms may be needed to ensure the process of Free, Prior, Informed Consent takes place effectively with affected communities and customary land rights are safeguarded. Key stakeholders whose views should be sought include: diverse community members (including women, children, youth, older people, migrants and other marginalised groups) affected by agricultural, mining and other concessions, local leaders, civil society organisations, government representatives, international investors and other stakeholders, such as members of the Roundtable on Sustainable Palm Oil.
- Rigorous Environmental and Social Impact Assessments need to be conducted before operations start. Accurate mapping of customary land rights, community resources and cultural sites, livelihoods, land use, biodiversity and ecosystems services is a critical tool in this process.
- Greater clarity and awareness-raising is needed at all levels about customary and statutory land tenure laws and the relationship between these different systems, in addition to processes for land allocation at local and national levels. Accessible means of communication such as radios, community meetings and so on should be used to ensure community members are aware of their customary land rights and legal protection mechanisms to seek redress and compensation. Good governance and capacity-building of key institutions (such as the Land Commission) and relevant Government Ministries would help to ensure effective implementation of relevant land tenure laws and policies[6].
- Efforts are needed to improve basic services and infrastructure in rural communities and invest in food crop cultivation to enhance food security and poverty alleviation. This includes increasing male and female farmers' access to inputs, equipment, training and advice in order to enhance agricultural productivity and food security and alleviate poverty. Such assistance is especially important if small-scale farmers are no longer able to practice shifting cultivation due to the reduction/ loss of customary land and the need to farm more intensively on smaller areas of land.

[6] In the Liberian context, these include the National Forestry Reform Law for Liberia and the Community Rights Law.

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