Nigeria's REDD+ Readiness Programme – Beyond Carbon

Consultation & joint working session on spatial planning for REDD+ in Cross River State

Workshop & Working Session Report

A workshop & working session convened as part of Nigeria's National UN-REDD Programme,

30 October – 12 November, 2014, Calabar, Cross River State, Nigeria

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Environment is your life, keep it safe.
Vision: To ensure a Nigeria that develops in harmony with the environment.
Mission: To ensure environmental protection and natural resources conservation for a sustainable development

Cross River State Forestry Commission

Cross River State Forestry Commission, Calabar, Cross River State

Website: http://www.crossriverstate.gov.ng

Vision: To be home to one of the world's greenest and biologically most diverse and richest forest by all global standards.
Mission: To protect and manage the State's Forestry resources.

The workshop and joint working session covered in this report were organised by the Cross River State Forestry Commission and the Federal Ministry of Environment as part of Nigeria's National UN-REDD Programme.

The UN-REDD Programme is the United Nations Collaborative Initiative on Reducing Emissions from Deforestation and forest Degradation (REDD) in developing countries. The Programme was launched in 2008 and builds on the convening role and technical expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). The UN-REDD Programme supports nationally-led REDD+ processes and promotes the informed and meaningful involvement of all stakeholders, including Indigenous Peoples and other forest-dependent communities, in national and international REDD+ implementation.

The UN-REDD Programme provided technical support from the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) for this workshop. UNEP-WCMC is the specialist biodiversity assessment centre of the United Nations Environment Programme (UNEP), the world's foremost intergovernmental environmental organisation. The Centre has been in operation for over 30 years, combining scientific research with practical policy advice.

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UNEP WCMC

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Acronyms and abbreviations

CERCOPAN	Centre for Education, Research, and Conservation of Primates and Nature
CRGIA	Cross River Geographic Information Agency
CRS	Cross River State
CSO	Civil society organization
EIA	Environmental impact assessment
ES	Ecosystem services
FR	Forest Reserve
GIS	Geographic Information System
GPS	Global Positioning System
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
LGA	Local Government Area
MoU	Memorandum of Understanding
NGO	Non-government organization
NP	National Park
NTFPs	Non-timber forest products
NUJ	Nigeria Union of Journalists
PGA	Participatory Governance Assessment
REDD+	Reducing Emissions from Deforestation and Forest Degradation; 'plus' Conservation of forest carbon stocks, sustainable management of forests; and enhancement of forest carbon stocks
UNEP	United Nations Environment Programme
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre
WCS	Wildlife Conservation Society

Introduction

This report presents the outcomes of three connected events organised under the Nigeria National Readiness Programme, which took place over 30 October to 12 November 2014, in Calabar, Cross River State. Aimed at progressing work on the identification of priority multiple benefits (see Box 2) from REDD+ to support land use planning, these included a consultation workshop on spatial planning for REDD+ in Cross River State, a joint working session on such spatial planning, and a report-back meeting to share the progress made.

The workshops involved around 30 participants each time, representing a range of organizations, including government agencies, both National and Cross River State REDD+ Secretariats, academia, civil society and community groups. The working session involved a smaller group of participants, many with a technical background and experience in spatial planning, including staff from the Cross River State Forestry Commission (CRSFC), representatives of NGOs based in Calabar and a member of a local community (participants lists are provided in Annex 1).

Box 1: What is REDD+?

REDD+ (Reducing Emissions from Deforestation and forest Degradation+[1]) is an initiative intended to combat climate change by changing the ways in which forests are used and managed, so that emissions of greenhouse gases from forests are reduced and carbon sequestration is increased. REDD+ may require many different actions, such as protecting forests from fire or illegal logging or rehabilitating degraded forest areas.

[1] *The "+" indicates the inclusion of the following activities, i) conservation of forest carbon stocks, ii) sustainable management of forests and iii) enhancement of forest carbon stocks.*

Box 2: What are multiple benefits and REDD+ safeguards?

REDD+ has the potential to deliver multiple benefits beyond carbon. For example, it can promote biodiversity conservation and secure ecosystem services from forests such as water regulation, erosion control and non-timber forest products.

REDD+ may also carry some social and environmental risks; for example displacing the factors causing deforestation to other areas. REDD+ safeguards are intended to help guard against risks and enhance benefits from REDD+.

1. Consultation workshop on spatial planning to support REDD+ in Cross River State

1.1 Overview

This consultation workshop was part of work to support Nigeria to enhance the potential benefits from REDD+ and reduce the potential risks through strengthened REDD+ planning, directly contributing to the delivery of Nigeria's National REDD+ Programme. The purpose of the workshop was to contribute to identifying and assessing multiple benefits from REDD+ to support REDD+ planning in CRS and in the national context. Participants of this workshop provided feedback on the priority work areas identified in the previous workshop and guidance on how information can be gathered to inform this work, including for spatial planning. The consultation helped to set the context for the collaborative production of spatial layers for decision-support maps on multiple benefits, particularly during a spatial planning joint working session, which took place during 3-12 November 2014.

1.2 Workshop objectives

i) Progress work on output 4.3 of Nigeria's REDD+ Readiness Programme "Cross River State established as a centre of excellence & learning on REDD+" and the related work streams on:
   - Developing social and environmental safeguards for Cross River State;
   - Identification of priority benefits from REDD+ to support land use planning.
ii) Build capacity for key stakeholders to guide work on safeguards and multiple benefits and spatial planning for REDD+.

1.3 Summary of workshop topics

Mr Odigha Odigha, Chairman of the Cross River State Forestry Commission, officially opened the session with a welcoming speech in which he said that effective implementation of REDD+ will produce other benefits apart from reducing emissions from deforestation and forest degradation, including enhanced ecosystem services and other benefits. He then urged the participants to take active part in the workshop and to help to identify priority areas for REDD+ planning.

Presentations:

Workshop objectives & recap from last workshop

Bridget Nkor (Chief Forestry Superintendent, CRSFC)

Bridget gave a recap of the last workshop and the objectives of the consultation workshop. She outlined the activities/discussion that took place in the last workshop on multiple benefit mapping and safeguards, including 'what is multiple benefit mapping and safeguards for REDD+, why they are important and communications and the potential areas for capacity building'. She also presented the objectives of this workshop.

Update on Nigeria's REDD+ National Programme

Moses Ama (National REDD+ Secretariat)

Mr Ama made a presentation on behalf of Mr Salisu Dahiru (Nigeria's National Coordinator for REDD+), who couldn't attend because of an official engagement. In his presentation, the history and structures of Nigeria REDD+ programme were the main focus. He reflected on the rapid depletion of forest in Nigeria, and how REDD+ could be a solution. He also reported on the activities carried out so far.

Progress on Participatory Governance Assessment (PGA) & initial results

Tony Atah (UNDP/REDD+ Secretariat, CRS)

Mr Atah gave an overview of Nigeria's experience of PGA and its links with REDD+ safeguards and multiple benefits. He outlined the governance domains of the Nigeria PGA and concluded by saying that natural resource governance should be people-centred and people-driven.

Overview of REDD+ multiple benefits, safeguards and spatial planning

Charlotte Hicks (UNEP-WCMC)

Ms Hicks gave a presentation on 'Using maps to support REDD+ planning: Exploring multiple benefits, risks and costs of REDD+'. She provided an overview of the role of spatial analysis in supporting REDD+ planning. Her presentation also covered possible ways of addressing REDD+ benefits and risks and how spatial information can be used to identify priority areas for REDD+ actions. She concluded by saying that maps cannot make decisions but can help planners to make decisions.

Recap from the last workshop: Priorities for spatial planning for REDD+ in CRS

Ashikem Akomaye (CRSFC)

Ashikem Akomaye gave a presentation on behalf of Bridget Nkor on outcomes from the last workshop, focusing on the identified priorities for spatial planning for REDD+ in CRS. He outlined the prioritized maps including: Population maps, Ecotourism maps, Mining maps, Regional-planning maps, Relief maps, Non-timber forest product maps, Watershed-management map, Migration maps, Biodiversity maps (including both flora and fauna).

Applying spatial data: important considerations

Paulus Maukonen (UNEP-WCMC)

Mr Maukonen presented on "What to consider when using spatial data in REDD+ planning". When gathering data for REDD+ spatial planning factors should be considered such as: availability and accessibility; accuracy and relevance; resolution and scale; and non-spatial information. He noted that spatial data is everywhere and can be sourced both locally and globally, and concluded by saying that consultation with different stakeholders is needed to define the scope of the map, and decide upon the data to be used.

Closing remarks

Mr Odigha Odigha, Chairman of CRSFC

The workshop closed late in the day. In his closing remarks, Chairman Odigha thanked all the participants for staying late and actively participating, and appreciated their contribution to the success of the workshop.

1.4 Results of discussion on priorities for spatial planning and future work

After the presentation of the priorities for spatial planning work from the previous workshop, the participants discussed whether this list of priority maps needed further clarification or any revision. The main points were as follows:

- The group agreed that the list still represents the priority maps, although adjustments may be needed according to data availability and to clarify the topics the maps could cover.
- Although maps showing the distribution/densities of NTFPs are preferred, there is a lack of inventory data. A potential proxy is volumes of trade in key NTFPs like bush mango.
- In terms of migration, elephants migrate for water and mating season, whereas gorillas may move around for security (e.g. to avoid disturbance). In the Afi Mountains, there are two populations separated due to agricultural encroachment.
- In terms of population maps, it was suggested that this category include socio-economic aspects, such as income or poverty levels.

- Other areas of interest could be: maps showing particular drivers of deforestation; soil erosion risk; watershed management. Natural disasters were also mentioned, but raise the question of whether accurate models/projections are available.

1.5 Group exercise: how to apply available spatial data to support REDD+ planning in CRS?

In order to provide more detailed feedback and advice regarding the priority maps identified for spatial planning work in CRS, the workshop participants carried out an exercise in small groups. Each group examined 1-2 priority maps, outlining what layers and content should be included in it and where data could be sourced. Each group also presented their findings to everyone, allowing more discussion on the maps. The results are as follows:

Layer	Content	Data
Biodiversity & migration corridors		
Species presence	Chimpanzee, high/low density	CRS Forestry Commission (data from rangers)
	Gorilla, high/low density	
	Elephant, high/low density	(NB: despite potential sensitivities, still important to show such info for REDD+, tourism, etc. Hunters also look for water sources to find wildlife)
Migration corridors	Gorilla, elephant (NB: Going in both directions)	(NB: low densities may be result of migration at certain times of year)
Watersheds		
Waterways	River , streams, water bodies	Already available
Population		
Density	Scale: for the pilot sites	Household surveys
Gender		Market surveys (NB: potentially conflict between these two datasets)
Rural/urban		
NTFPs		
Key species distribution	E.g.: cane rope; bush mango; afang; native sponge; cattle stick; chewing stick; hot leaf; eritan; otasi; bitter kola; moi moi leaf; honey. Dots for distribution points	Local community records (sales/volumes)
Volume of extraction/ (trade?)	Polygons	Data on sales/trade of NTFPs changes 'look' of map from points to shapes, e.g. s-m-l circles, etc
Periodicity/seasonality	Brown/green for dry season/wet season	(Possible proxy? Forests not used for timber…)
Mining		
Mining sites	Colour coding for clusters/intensity (high/low intensity sites) Mining applications/permits (ie approved mining sites) Illegal/artisanal mining?	Info needed: - Have GPS data for 7 sites - Gazetted forestry maps - MoUs between companies & communities - Environmental impact assessment (EIA) reports
Boundaries (admin)		
Settlements	Points (NB: mining sites more dangerous for local people)	Sources: - Fed. Ministry of Mining - CRS Dept of Mineral Resources - Dept. of Environment - Dept. of Land & Housing
Streams/rivers	Thick/thin for major/minor water bodies	
Forest/wildlife species		
Roads & bridges		

		- CRSFC - Ministry of Agriculture - Online/secondary sources (NB: data not always publicly available & can be sensitive)
Ecotourism		
Endangered species	Show feeding/breeding sites	Info needed: - Existing list of endangered species; maps of wildlife presence - List of ecotourism sites & GPS data - Historical data (local hunters' knowledge?) Sources: - Cross River National Park - Tourism Bureau/ Board - IUCN species data - CRSFC - Online/secondary sources - NGOs (CERCOPAN, Pandrillus) - Research institutes/academia
Routes/trails		
Streams/rivers		
Vegetation		
Roads		
Facilities/campsites	(NB: lots of detail, how to show at CRS scale? And is map for ecotourism promotion or REDD+ planning?)	
Regional planning (as information needed for REDD+ planning)		
Forest/land cover	CRS scale, including plantations, degraded/rocky land & farmland (NB: degraded land definition based on fallow land and period left fallow)	- Economic Planning Dept. - State Planning Commission - State Boundaries Commission - State Statistical Office (NB: tenure data not so relevant: NPs, FRs and all else community lands) (NB: all data accessed via State Statistics Office, need letter of request)
Relief map	Hills, water bodies	
Settlements	Towns, villages, farm settlements, major landmarks (NB: include development/housing areas?)	
Flora/fauna		

2. Joint working session on spatial analysis to support REDD+ planning in Cross River State

2.1 Overview

The joint working session on spatial analysis was held over 3-12 November at the CRSFC Computer Lab in Calabar. The session included 13 participants from the CRSFC, as well as two NGO representatives and one community representative (see Annex 1 for the participants list). In addition to building the capacity of the participants to undertake mapping of multiple benefits and other elements related to REDD+, the working session further contributed to the ongoing collaborative production of spatial layers to support REDD+ planning in Cross River State.

2.2 Objectives of the session

i)   Progress work on output 4.3 of Nigeria's REDD+ Readiness Programme, "Cross River State established as a centre of excellence & learning on REDD+" and the related work streams on:
- Developing social and environmental safeguards for Cross River State;
- Identification of priority benefits from REDD+ to support land use planning.

ii)   Build capacity for key stakeholders to guide work on safeguards and multiple benefits and spatial planning for REDD+, and for technical staff on REDD+ and its multiple benefits.

2.3 Topics covered

Recap of previous work

After a welcome, introductions and an overview of the agenda for the working session, **previous mapping work** undertaken with CRSFC was presented, along with the **mapping priorities and feedback** from the consultations last year and the week before. This feedback included: that socio-economic indicators be included, e.g. income levels; that soil erosion risk be considered; and that migration corridors focus on elephants and gorillas. Some other considerations were also highlighted: factors influencing the choice between different carbon stock layers; issues concerning data availability; using proxies for data that is not available/difficult to use; and which maps will support REDD+ planning, meet other needs, or potentially achieve both?

The participants then did an **interactive exercise** on using spatial information to identify priority zones for REDD+ actions using transparent map layers. The REDD+ action in question was 'extension of community based forest management in Tanzania'. The two groups defined different goals for their action, and thus chose very different layers and ended up with very different priority locations:

REDD+ action being considered: extension of community-based forest management in Tanzania		
	Group 1	**Group 2**
Goal/objective	Promote watershed management and reforestation via community forestry	Reduce forest degradation, improve protection and supply fuel
Base-map selected and why?	Natural forest: shows existing forest blocks under protection	Woody biomass carbon: to assess the carbon sources; to assess the potential pressure on the carbon source
Layers selected and why?	o Population density: indicates threats to forest o Roads/access: indicates potential use of forest resources	o Participatory forest management activities: to know how communities activities affect the pressures on the carbon stocks

	○ Waterways also important, shown in blank map that forms final layer	○ Charcoal production: charcoal production has impact on carbon stocks ○ Protected areas: areas where have management, where could enhance carbon stocks
Data unavailable that would have been useful	○ Information on community by-laws and enforcement mechanisms to show where CBFM more feasible/effective	○ Data on rate of deforestation and volumes of charcoal/fuelwood ○ Transparent layer for vegetation cover
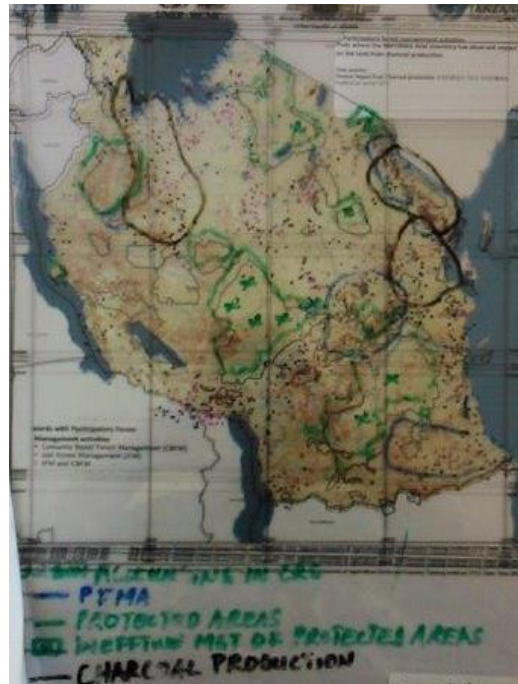
Introduction to QGIS

Quantum GIS (QGIS) software was installed for each participant, and data and other information for the session was provided on flash drives. The participants worked through a first tutorial, **an introduction to QGIS**, exploring the data, projection settings, adding and removing layers, and changing the symbology of a map. It was emphasized that use of the data provided in the session involves different requests for permission – these had to be obtained for purposes of the working session and would be needed for future different uses.

Biodiversity conservation

On the second day of the working session, we started with a discussion on why REDD+ planning may want to consider biodiversity conservation. The key reasons cited by the participants were:

- Biodiversity is another benefit from REDD+
- Biodiversity conservation helps address the Cancun Safeguards
- Biodiversity can help maintain ecosystem functionality (i.e. may help implement some REDD+ actions)
- Communities may also depend on biodiversity for livelihoods and well-being

Map 1: Richness of terrestrial species (all IUCN red list categories) in Cross River State
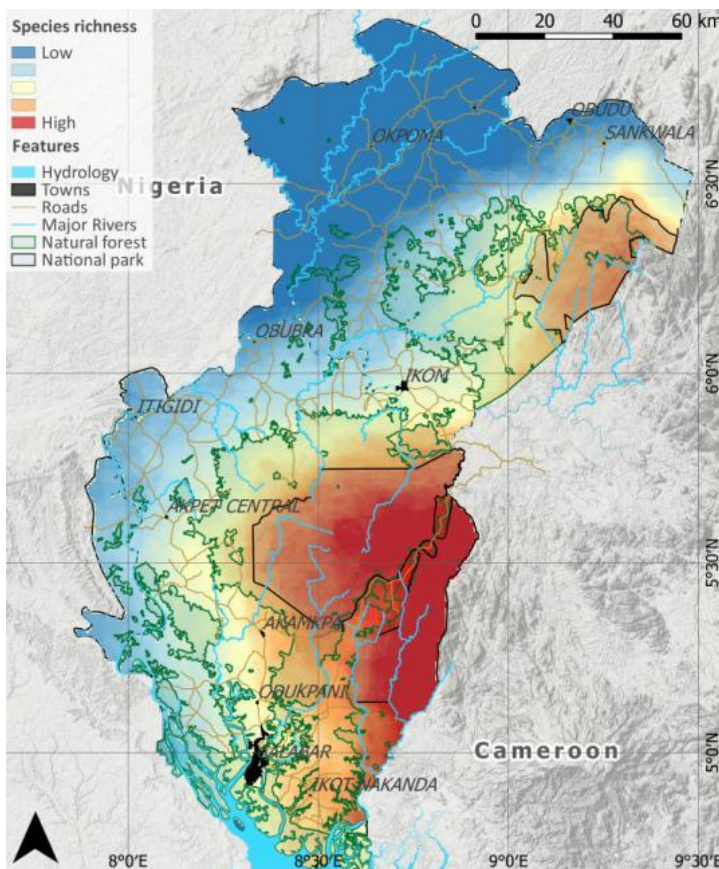
Data sources: *Species ranges:* IUCN. 2014. The IUCN Red List of Threatened Species. Version 2014.1. Downloaded October 2014 [http://www.iucnredlist.org]. *Forest extent and PA boundaries:* Flasse S, Archer D, Boschetti L and Abell T. 2002. Cross River State Community Forestry Project: Rapid Appraisal of Forest Resources from Remotely Sensed Data. Environmental Resources Management and Scott Wilson Kirkpatrick & Co Ltd for the Department for International Development (DfID). London, UK. *Map projection:* World Geodetic System 1984 (WGS84).

Map prepared by working session participants and UNEP-WCMC. Date: January 2015.

Different types of spatial information that can be useful for considering biodiversity conservation were also discussed, e.g. location of protected areas and key biodiversity areas (KBAs), points of observance for wildlife (e.g. gorilla nest sites), and species richness.

IUCN species range data was then introduced, along with where it is sourced (the IUCN Red List of Threatened Species) and the permissions required to use this data. The participants split into pairs and worked through a tutorial on processing species range data, in order to produce **a species richness map**. The parameters of the species data requested included: CR, EN, VU, LR, NT, DD and LC[1] species of terrestrial mammals, birds and amphibians in Nigeria; presence extant and probably extant; of native origin, (re)introduced, uncertain. In pairs, the participants processed the data and began work on a species richness map for CRS. Later, the dataset was reduced to just CR and EN species so that an initial map output could be produced in the time available. Map 1 above shows species richness across the State, ranging from low species richness in blue to high species richness in red.

In addition, we discussed data availability for mapping **other aspects of biodiversity**, such as migration corridors, and data on gorillas, elephants and chimpanzees. It was noted that the species range data for elephants and chimpanzees is very broad (especially if for common chimpanzee, *Pan troglodytes,* as opposed to Nigeria-Cameroon chimpanzee, *P.t. ellioti*), and it does not allow identification of potential corridors. Potential sources of information to follow up on include the University of Calabar; Cross River National Park, Pandrillus, Nigerian Conservation Foundation, CERCOPAN, and any regional conservation plans (e.g. Regional Action Plan for the Conservation of Chimpanzees in West Africa).

Ecosystem services from forests

This section began with a discussion on ecosystem services (ES) from forests, and how some of these services can be mapped. Those ES identified included: provision of non-timber forest products; cultural and recreational sites, (e.g. sacred forests and tourism sites); control of soil erosion; maintenance of water quality; contribution to pollination & dispersal of seeds; protection against extreme weather/events; carbon sequestration; and climate regulation.

Again in pairs, the participants worked on mapping **soil erosion risk** in CRS, using SAGA as well as QGIS. The role of forests in limiting soil erosion is evaluated as a function of slope, rainfall and the presence of something important downstream that could be adversely affected by soil erosion, such as a dam or water body. There was also some discussion on ways to calculate slope in the field versus using a modelling approach. After preparing three layers showing slope, precipitation, and drainage/catchments, later in the session these were then combined to produce a map indicating erosion risk in the state.


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[1] CR: critically endangered; EN: endangered; VU: vulnerable; LR: low risk; NT: near threatened; DD: data deficient; LC: least concern.

Another priority identified for mapping was **non-timber forest products (NTFPs)**. However, there is a lack of comprehensive, recent and digitized data on NTFP distribution and use in the state. After discussing some of the different ways that data on NTFPs could be sourced and mapped, the participants carried out an exercise on developing a map from non-spatial data on NTFPs. In small groups, they used survey data in 6 villages in Akamkpa to make maps showing variables related to NTFPs. Each group decided on which variables to map, how to show them, and what other layers/information to show.

Socio-economic information

This section began with a discussion about what **kinds of socio-economic data** is of interest in REDD+ planning, such as population, demographics, income, livelihoods, cultural values & customary practices, land use and tenure. The participants then prioritised which types they feel are a) possible to map and b) important to map. Top votes went to livelihoods and capacity data, followed by population, cultural values/practices, land use and land tenure. We also discussed how data on population/poverty can be interpreted both as a pressure as well as an opportunity for REDD+ implementation to contribute to social benefits.
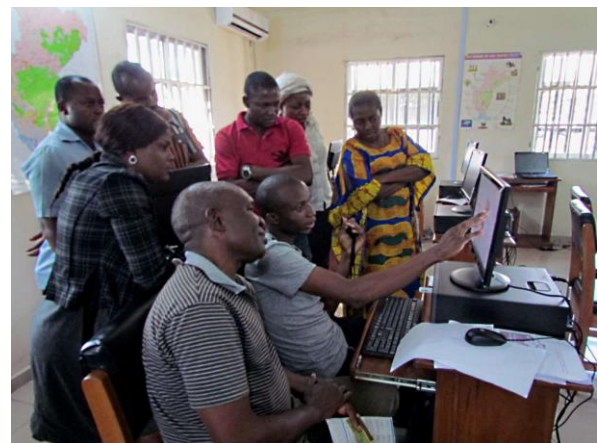
The participants then started an exercise on **adding socio-economic information to polygons,** using local government areas (LGAs), population, income, household poverty and Gini coefficient information sourced from the CRS statistical yearbook and other socio-economic reports. Each group then overlaid their socio-economic layers with other information, such as forest cover, land use, carbon, and so on, in order to develop a map that could be used to identify potential priority zones for community forestry actions. They also presented their maps to everyone for comments/feedback.

Discussion – defining forest and natural forest

The group had a discussion on the forest definitions in use in CRS, as well as implications of these, and how to define natural forest.

Is there a Nigeria national forest definition? Yes, it was decided to use the FAO definition of forest for REDD+ purposes: 0.5 ha or above in size; 5 m in height; 10% canopy cover.

But there's also a CRS forest definition? Yes, this definition has been used in other programmes: Extensive (at least 1 ha); with large (mature) trees; a diversity of species; canopy cover levels used to distinguish between THF, open forest, etc (see Flasse Consulting/DFID, 2002)

Some issues to consider:
- o The 2001-2002 vegetation map uses the CRS definition
- o What definition has been used for later forest cover datasets? Will they be comparable?
- o Which definition are the REDD+ pilot sites using?

Why is a definition of natural forest important? It relates to the Cancun safeguards (safeguard "e")
So in CRS, what is included in 'natural forest'? Based on the 2001/2002 vegetation map categories:

Veg. type	Natural forest?
Tropical high forest	√
Open forest (degraded)	√
Regenerating forest (natural regeneration)	√
Gmelina plantation	x
Rubber plantation	x
Oil palm	x
Swamp forest	√
Mangrove	√
Farm land (includes savannah, grassland, farms and fallow)	x
Town	x

The natural forest layer produced form this classification is shown below (Map 2).

Pressures affecting forests

The participants began a session on pressures on forests by discussing those pressures and drivers that they feel play a role on deforestation and forest degradation in CRS. These include:
- o Mining
- o Over-exploitation of NTFPs
- o Agricultural expansion
- o Fire
- o Urbanization
- o Removal of keystone species (e.g. hunting)
- o Logging
- o Encroachment (improving access to forests)
- o Infrastructure development
- o Some traditional practices

We then introduced a number of **spatial layers related to pressures on forests** that we had available to use, such as:

- The population and other socio-economic information used already in the session.
- Location of mining/quarries in Akamkpa - noting that more data may be available from the Dept. Solid Minerals, as mining of granite, barite, and construction materials occurs around CRS.
- Roads – the participants discussed buffering these to show potential to affect forests, deciding it should be 1-2 km, or even lower if we wanted to limit it to impacts associated with roads directly, i.e.. 500 m on either side.
- The Human Influence Index – this is a freely available global dataset, using information from 1995-2004, and including built-up areas, population density, night time lights, land use/land cover; coastlines, roads, railways, and riverways.
- The Hansen dataset showing tree cover loss and tree cover gain, 1990-2012 - bearing in mind that this is global data based on satellite images, so there may be questions related to its accuracy.

Map 2: Natural forest categories in Cross River State
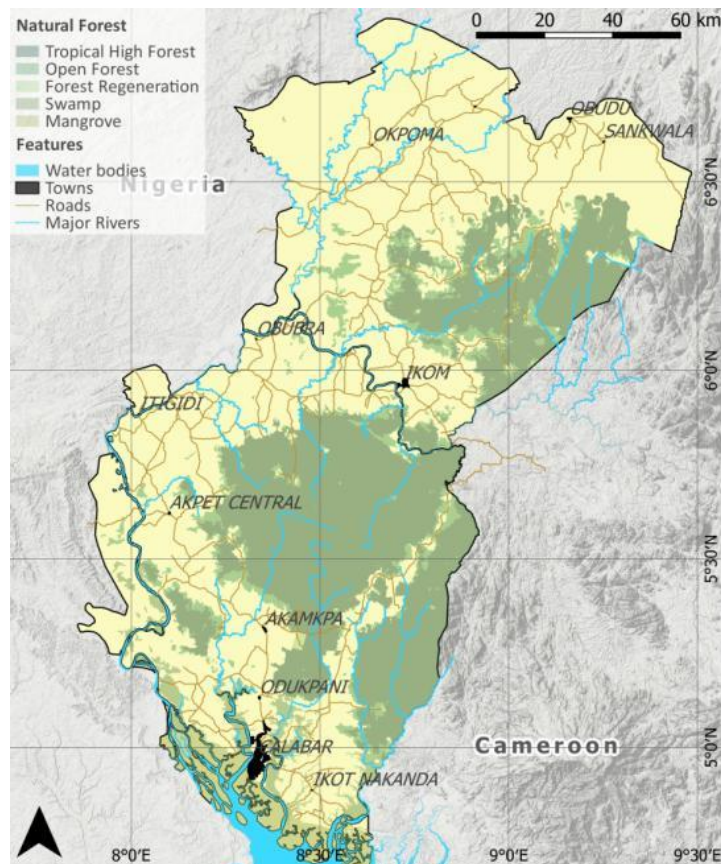
Data sources: *Forest types*: Flasse S, Archer D, Boschetti L and Abell T. 2002. Cross River State Community Forestry Project: Rapid Appraisal of Forest Resources from Remotely Sensed Data. Environmental Resources Management and Scott Wilson Kirkpatrick & Co Ltd for the Department for International Development (DfID). London, UK. *Map projection*: World Geodetic System 1984 (WGS84).

Map prepared by working session participants and UNEP-WCMC. Date: January 2015.

Drafting maps and creating map layouts

Before starting work to prepare some **draft output maps**, the participants discussed the carbon layer to be used for future maps; confirming a previous selection, Saatchi was chosen as the carbon layer for CRS because: a) it includes below-ground biomass; b) it looks more accurate for CRS and Lake Chad. Map 3 (right) shows the carbon layer prepared for CRS, with areas of low carbon stocks in yellow, ranging to green for areas with high carbon stocks. Map 4 shows this carbon layer overlaid with forest areas.

Map 3: Carbon stocks in CRS, based on Saatchi et al. (2011)
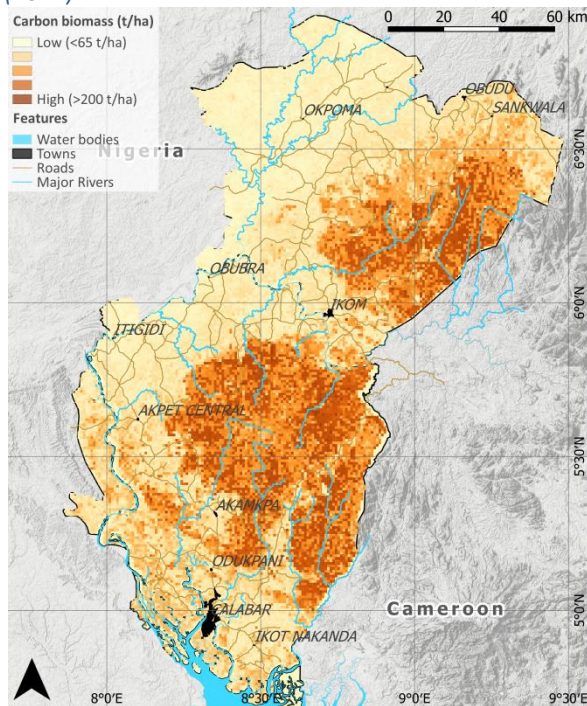
Map 4: Carbon stocks in CRS inside and outside natural forest

Data sources: Saatchi S, Harris N L, Brown S, Lefsky M, Mitchard E T, Salas W, Zutta B R, Buermann W, Lewis S L, Hagen, S, Petrova S, White L, Silman M, Morel A. 2011 Benchmark map of forest carbon stocks in tropical regions across three continents. Proceedings of the National Academy of Sciences USA. Jun 14; 108(24): 9899-9904. [www.pnas.org/cgi/doi/10.1073/pnas.1019576108]. *Map projection:* World Geodetic System 1984 (WGS84)

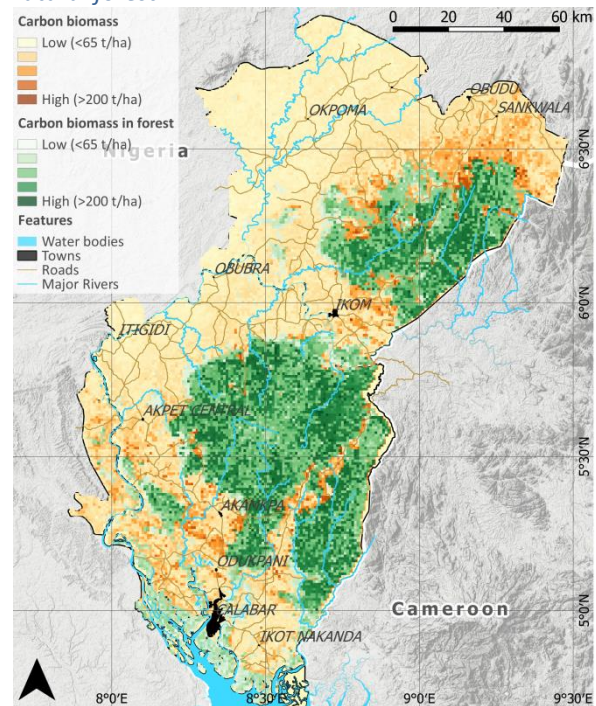*Maps prepared by working session participants and UNEP-WCMC. Date: January 2015*

In small groups, the participants then carried out an exercise on **designing map layouts**, including key features such as scale bar, north marker, grid, legend, citation, title, and so on. They then split into four teams to start work on combining layers for particular outputs maps:

- Species richness and carbon stocks;
- Soil erosion risk;
- Ecotourism;
- Road network and natural forest.

To show the usefulness of a **'peer review'** process, each team presented their initial draft map and what steps they followed to produce it. Everyone then asked questions and provided comments on the maps, covering issues such as:

- Why particular layers were chosen
- Missing layers to include
- Symbology and overall style
- Simplifying 'busy' maps
- Relevance to REDD+ planning

The teams then made improvements and adjustments to the maps, incorporating feedback from the others; the draft output maps have now been produced, although further 'peer review' and consultation with users will be needed. Three of these maps (5-7) are shown on the following page.

Using GPS devices and data

On the final day of the session, the participants had the opportunity to go outdoors and practice using GPS devices, with an exercise on **recording, downloading and using GPS data**. Four teams were formed, each responsible for recording GPS points and associated information of different features in the CRSFC botanic garden. The four groups covered:

- Location of large trees,
- Trees being used by birds
- Location of damage/degradation
- Garden facilities and boundaries

The information was then used to create a map of the area in QGIS.

Relief map

The final task of the working session was to produce **a relief map of CRS**. This was done by clipping a digital elevation (DEM) model output to the boundaries of CRS, and running a relief tool in QGIS to create a relief map showing terrain. The participants then added features to their maps, such as rivers and natural forest, and discussed why relief maps can be useful for REDD+ planning (e.g. as an indication of ease/difficulty of access to an area).

Map 5: Risk of soil erosion in CRS as a function of slope and average annual rainfall
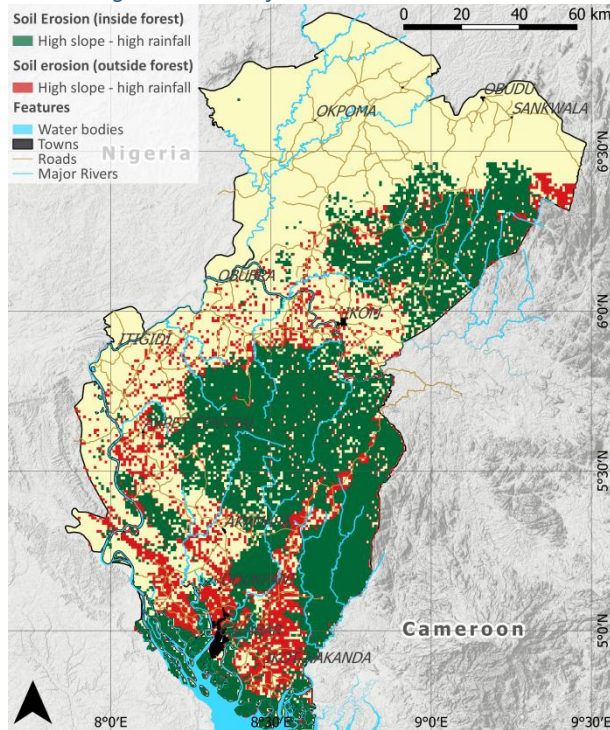
Map 6: Sites related to ecotourism in CRS
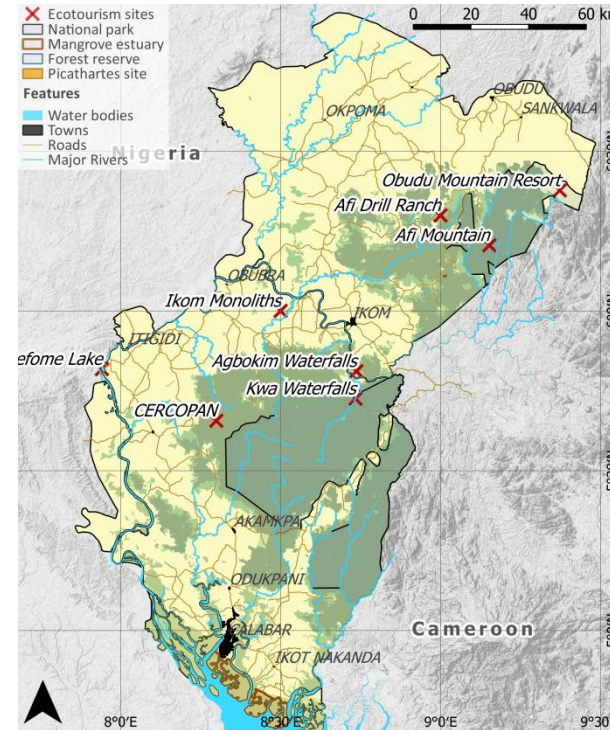
Map 7: Locations of roads (buffered to 1km) in relation to the extent of natural forest in CRS
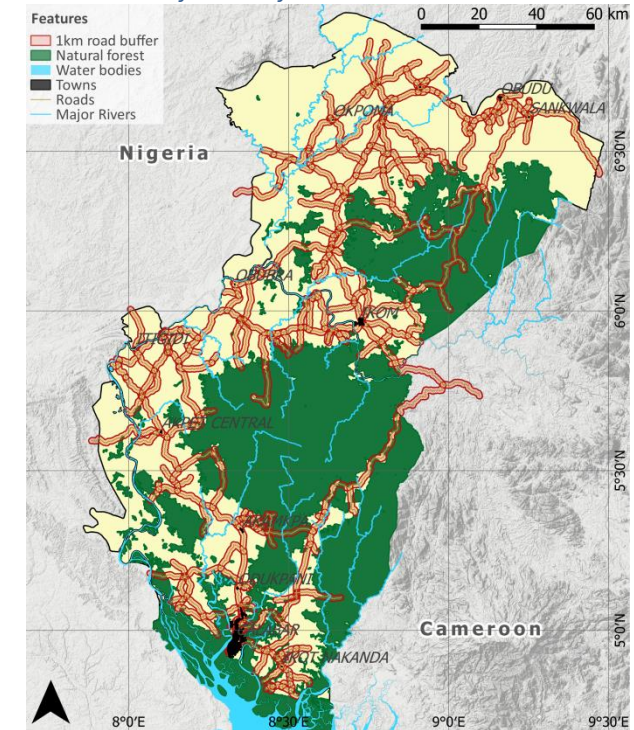
Data sources: *Slope:* generated from Lehner B, Verdin K and Jarvis A. 2008. New global hydrography derived from spacebourne elevation data. Eos, Transactions American Geophysical Union, 89 (10): 93-94. Downloaded October 2014 [http://hydrosheds.cr.usgs.gov/datadownload.php]. *Precipitation:* Hijmans R J, Cameron S E, Parra J L, Jones P G and Jarvis A. 2005. Very high resolution interpolated climate surfaces for global land areas. International Journal of Climatology 25: 1965-1978. Downloaded October 2014 [http://www.worldclim.org/current]. *Forest extent and PA boundaries:* Flasse S, Archer D, Boschetti L and Abell T. 2002. Cross River State Community Forestry Project: Rapid Appraisal of Forest Resources from Remotely Sensed Data. Environmental Resources Management and Scott Wilson Kirkpatrick & Co Ltd for the Department for International Development (DfID). London, UK. *Map projection:* World Geodetic System 1984 (WGS84)

Maps prepared by working session participants and UNEP-WCMC. Date: January 2015.

On the final day of the session, we held a discussion to outline some proposed communications materials on multiple benefits of REDD+ for CRS. Communications materials are one of the planned outputs of the current collaboration between UNEP-WCMC and the CRSFC. The participants together outlined the following:

A. Purpose of the materials
  o Convey information about REDD+ to people
  o Create awareness on REDD+ multiple benefits, especially to resource users, companies, etc
  o Target people associated with drivers of deforestation

B. Audience
  o Communities involved in encroachment/forest conversion
  o Government agencies involved in conversion of forests: Mining (Federal); Agriculture (State); Logging (State); Housing development (Local + State)

C. Format
  o For communities: maps (local scale) and posters; associated with performance/ event; plus items to hand-out (t-shirts, stickers, notebooks); documentary/ video possible?
  o For government agencies: documentary/ video; targeted maps (state scale) for different sectors

D. Key messages
  o REDD+ has multiple benefits for the State/communities
  o Your decisions have impacts on our forests
  o Tree planting is needed to restore forests
  o Forest loss affects wildlife/endangered species
  o Carbon protection/enhancement

E. Content
  o Explanation of REDD+
  o Maps: different scale for community/government; layers tailored to government agencies
  o Images should be included: from FAO Mediabase and CRSFC
  o Interaction important, i.e. events with communities, workshop/s with agencies

F. Language
  o Languages mainly spoken: English and Pidgin; but for written materials, use English
  o Languages in pilot sites: Afi-Mbe (Boki); Ekuri (many languages); mangroves (Efik)

G. Distribution/out-reach
  o Distribution should be through workshops, meetings; should also involve the media and use CRSFC website
  o Distribute copies of mapping report along with targeted maps to agencies

H. Resources/ collaboration
  o Budget to be clarified with CRSFC/Secretariat management
  o Collaborate with pilot site coordinators, NGOs and CSOS, CRSFC staff, media

I. Risks
  o REDD+/workshop fatigue in communities
  o Managing expectations of communities
  o Sending too negative a message

J. Timeline
  o Within UN-REDD Programme period
  o Be aware of rainy season and community activities, to avoid clashes

2.4 Participants' feedback

In order to gather feedback from the participants about the utility of the working session and suggestions for the future, a feedback questionnaire was distributed on the last day. The results of the questionnaire are summarized below.

Regarding how useful the working session was in **developing knowledge and capacity on REDD+ multiple benefits and safeguards**, most participants reported that the session was "very" (7 responses) to "exceedingly" (3 responses) useful. For instance, comments included:

> *"This working session has really further widen my horizons on REDD+ multiple benefits and safeguards. It has added more indicators to the benefits already known"*

> *"...it enhanced my knowledge of the importance of REDD+ and its benefits"*

Most participants also reported the session was "very" (6 responses) to "exceedingly" (4 responses) useful in developing their **capacity to use spatial analysis tools**. Participants mainly highlighted the session increased their knowledge on how to use QGIS software and tools, and how they can now perform new tasks using this knowledge:

> *"I can now draw maps and interpret them very well"*

> *"I can handle any datasets using the QGIS tool"*

> *"I could hardly use spatial analysis tools before [...] I have learnt a few things on how to use spatial analysis tools"*

> *"...this session has given me an understanding on how to use maps to get different information on types of forest cover, relief maps, topography, soil erosion, etc."*

Regarding the **most useful topics** covered in the session, four participants highlighted mapping different components (e.g. forest, degraded areas, species richness, socio-economic, pressures, and community forestry). Two participants specifically mentioned how useful it was to create a soil erosion risk map, while two others also found the matrix legend tools useful. Other aspects considered useful by the participants included using relief and image classification tools, biomass carbon stocks and general GIS knowledge.

In terms of **less useful topics**, four out of seven participants reported all content was helpful, while the others nominated basic topics like adding rasters and vectors, creating topographic maps, and the carbon, watershed and migration maps as least useful.

Seven participants considered that **the organization of the working session** was suitable or very suitable. One participant reported it as moderate.

When questioned on their **knowledge on certain GIS tasks** after the working sessions, most participants stated that they now know "a moderate amount more" or "a lot more" about the tasks, particularly about modifying the symbology/visualization of maps and exporting a map image. Fewer participants reported increased knowledge in adding delimited text files to create points and using the raster calculator.

Regarding **additional technical knowledge** that would be helpful to undertake work on spatial planning for REDD+, most participants nominated learning about geo-referencing tools (3 responses), the continuous and regular use of the skills learnt (2 responses) and learning how to use other software (2 responses). Other suggestions included learning how to acquire data and using SAGA tools. Some of the suggestions were:

"I think the knowledge is quite enough, what I need now is the encouragement and continuous use of the tools"

"Online video tutorials [and] printed step by step approach for activities such as creating a DEM map"

The participants also provided other comments and suggestions, including about more training in the future, extension to other stakeholders, their interest in further improving their skills and that certificates of participation be made available:

"Further training with longer duration"

"...once in a year this very workshop should be repeated to enable us to learn more and get connected to each other"

"I have learnt quite a lot and will definitely put it in practice"

"… More community people [should] be involved in further planning so that the message of REDD+ will be a table-name"

"I will need to understand the matrix tool and use it effectively"

"…Certificates should be provided to participants"

3. Report back meeting

3.1 Overview

Held directly after the completion of the joint working session on spatial planning, this report-back meeting took place on 12 November at the CRSFC/REDD+ Secretariat in Calabar. The meeting involved around 20 participants from the CRSFC, other government agencies including the Governor's Office and Cross River Geographic Information Agency, academia and NGOs. A list of participants is provided in Annex 1.

3.2 Objectives

i)   Report-back to CRS REDD+ planners and stakeholders on progress and outputs of the spatial planning working session on REDD+ multiple benefits and safeguards;

ii) Discuss challenges, recommendations and next steps for spatial analysis work to support REDD+ planning in CRS.

3.3 Presentations

The meeting began with a formal welcome from Mr Odigha Odigha, Chairman of the CRSFC, outlining the context for the meeting, including work to build the capacity of a range of stakeholders in the State on how to manage carbon forestry and REDD+.

Overview of working session & its objectives

Bridget Nkor (Senior GIS Technician, CRSFC)

Bridget outlined the objectives of the working session, and provided an overview of the links between REDD+ and spatial planning, noting how spatial analysis can support identifying locations for ecosystem-based multiple benefits, co-location of carbon stocks with other planning elements (e.g. land management units), and pressures on both forests and other benefits.

Topics covered and initial outputs

Paulus Maukonen (UNEP-WCMC)

Paulus highlighted the priority maps for supporting REDD+ planning in CRS, as identified by stakeholders in previous consultations, such as maps on population, ecotourism, mining and biodiversity. He outlined the draft maps produced so far through collaborative working sessions, including layers on carbon stocks, pressures (e.g. roads), natural forest, socio-economic factors (e.g. population, income), soil erosion risk, watersheds and relief, biodiversity, and ecotourism. Paulus then summarised how the various mapping priorities have been addressed so far, as well as constraints such as data availability.

Report from participants

Rose Ayang (CRSFC) and Osim Enya (Alesi Community)

Rose and Osim presented their own and the participants' perspectives on the working session. As well as noting the particular technical skills they developed (such as use of QGIS and SAGA GIS tools), they highlighted the opportunities to build understanding of the benefits of REDD+ beyond carbon, the use of spatial information for safeguards and multiple benefits, and how to interpret and show different spatial layers according to the objectives for REDD+ implementation and for the maps being produced.

Next steps

Charlotte Hicks (UNEP-WCMC)

Charlotte's presentation outlined the context of the working session, including the wider collaboration between the Nigeria National REDD+ Programme, CRSFC and UNEP-WCMC on multiple benefits, spatial planning and safeguards. She introduced the proposed next steps for the collaboration, such as finalization of spatial layers, preparation of a report on the mapping exercise, and continued work on safeguards. Several issues for discussion were also raised, including the need for consultation on draft maps and where additional data could be sourced.

Closing remarks

Odigha Odigha (Chairman, CRSFC)

Following a period of open discussion (see 3.4 below) and a goodwill message from Dr Oshaka (CRGIA), Chairman Odigha closed the meeting. He commented that the working session should also be seen as part of a 'training the trainers' process, and that he hopes the participants will further share the knowledge and skills that they have gained.

3.4 Discussion

The meeting included discussion on the outcomes of the working session, next steps, and more general issues related to REDD+ and multiple benefits. The main points of the discussion are summarized here:

- Andrew Dunn (WCS) noted that the locations of **industrial plantations** are important for regional planning maps; there is a need to know where these have encroached on forests, for example. Proforest UK has also been involved in developing **new forest cover/land cover data** in the State. Charlotte (UNEP-WCMC) also noted that other such data currently under development at the national level, and that the project will seek to access this, so that can have an updated view of land use forest cover in CRS.

- Andrew also commented that '**migration**' (as in migration corridors) was not really the correct terminology; in CRS, this should be more about corridors allowing movement of wildlife.

- Daniel Otu (University of Calabar) recommended that the **CRNP boundaries** be checked and validated. The Park was formed after the forest reserves (FRs) were established, and inherited some FRs (those that were too degraded were excluded). CRNP has proposed boundaries but it is not yet gazette, and in some areas, the Park and communities still have to come to a consensus. Only some boundaries have been demarcated (e.g. there are no disputes where rivers form the boundary). Echoing other participants, Daniel also noted that the forest cover data needs updating – likely there is less forest now.

- Answering a question about the **erosion risk map**, Paulus (UNEP-WCMC) explained that it shows soil erosion risk based on precipitation, drainage and slope, but doesn't include other forms of erosion (e.g. wind erosion). Also, it is an indication of risk, rather than the current distribution of soil erosion.

- Sylvanus Abua (POWER) noted, as a member of the **PGA**, that the assessment's scope is limited to five selected governance 'domains': participation; community organization; legal and policy; transparency; and coordination. Thus it may not result in much socio-economic data of relevance for spatial planning

work. However, some governance indicators may be of interest if data is available (e.g. communities with forest management by-laws).

- Regarding **further consultation on maps**, Andrew Dunn (WCS) asked whether the draft maps could be circulated for comment. Charlotte clarified that this would happen, but that further consultation may also be necessary on some topics (e.g. experts to advise on biodiversity/corridors).

- Chairman Odigha (CRSFC) briefly discussed some of the **continuing challenges for the forest sector** in CRS, such as reconciling protection with timber shortages, and the need to prevent further land degradation.

- Dr Oshaka (CRGIA) noted that CRSFC has **some significant powers** to control how people manage their own timber; Chairman Odigha (CRSFC) explained that while people have a right to cut own timber, this right is still regulated as there is a need to consider the other roles played by trees.

- Mr Henry Tiku Takon (Statistics/Research Dept. CRSFC) asked how genuine and useful are the data that were gathered from CRSFC. He also noted that **data concerning the State** must be approved by the Bureau of Statistics. For example, they have been involved in the PGA. Charlotte (UNEP-WCMC) commented that they have not generated any new data for mapping, as in the PGA; instead, the maps have used existing data (e.g. from the statistical yearbook and socio-economic survey). If they use published data, they hope that it would be considered appropriate.

- On the topic of **other available data**, Andrew Dunn and Francis Okeke (WCS) stated that they have prepared a forest cover report for the CRS northern forest block, and this can be shared. Dr Oshaka (CRGIA) also informed the group that his agency will be acquiring the latest satellite imagery for the state next year.

- Sylvanus Abua (POWER) further commented on the **accessibility of the spatial planning work**, pointing out that not all people can use computers and GIS; there is a need to involve the community level as well, to help them appreciate the role of forests, e.g. via participatory mapping.

- Charlotte and Paulus (UNEP-WCMC) agreed that the maps should not be too top-down. They should be seen as guidance, indicating trends/impacts, but they can't make decisions for us. There is a need to **involve others stakeholders** and the working session included some discussion about how some maps could be used as communications tools with communities and others.

Annex 1: Participants lists

1A Consultation workshop, 30 October 2014

Name	Organisation
Odigha Odigha	Chairman, Cross River State Forestry Commission
Perpetua Ali	Cross River State Forestry Commission
Angela Ngajiuto	Cross River State Forestry Commission
Agala Atte	Cross River State Forestry Commission
Ekpenyong Ita	Cross River State Forestry Commission
Ayeni Segun Boluwaji	Cross River State Forestry Commission
Mary Jane Ebri	Cross River State Forestry Commission
Ojah Egbai	Cross River State Forestry Commission
Ashikem Akomaye	Cross River State Forestry Commission
Bridget Nkor	Cross River State Forestry Commission
Caswel Esate Nkoro	Cross River State Forestry Commission
Joseph Ashibekong	Information, CRSFC
Tony Atah	UN-REDD CRS
Rosemary Oboh	UN-REDD CRS
Bassey Ituen	UN-REDD CRS
Vincent Oyamo	Ekuri Community
Oku Okang	Etara Community
Rev. Anthony Essien	Mangrove Community
McStephen Kembre	Mbe Community
Osim Enya	Alesi Community
Moses Ama	National REDD+ Secretariat
Ochuko Odibo	National REDD+ Secretariat
Tijjiani Ahmed	National REDD+ Secretariat
Daniel Otu	University of Calabar
Edwin Usang	Africa Representative at UN-REDD Policy Board
Emerald Ojong	NUJ Center
Martina Ubi	Ministry of Agriculture
Barr Enya Echeng	CRGIA

1B Working session, 3-12 November 2014

Name	Organisation
Sylvanus Abua	POWER (NGO)
Donatus Adie	Cross River State Forestry Commission
Ashikem Akomaye	Cross River State Forestry Commission
Moses Ama	National REDD+ Secretariat
Agala Atte	Cross River State Forestry Commission
Rose Ayang	Cross River State Forestry Commission
Ayeni Segun Boluwaji	Cross River State Forestry Commission
Osim Enya	Alesi Community
Harrison Ndifon	Cross River State Forestry Commission
Angela Ngajiuto	Cross River State Forestry Commission
Bridget Nkor	Cross River State Forestry Commission
Deborah Ogri	Cross River State Forestry Commission
Francis Okeke	WCS (NGO)

1C Report-back meeting, 12 November 2014

Name	Organisation
Odigha Odigha	Chairman, Cross River State Forestry Commission
Sylvanus Abua	POWER (NGO)
Donatus Adie	Cross River State Forestry Commission
Rose Ayang	Cross River State Forestry Commission
Osim Enya	Alesi Community
Bridget Nkor	Cross River State Forestry Commission
Deborah Ogri	Cross River State Forestry Commission
Francis Okeke	WCS (NGO)
Tony Atah	CRS REDD Secretariat
Daniel Otu	University of Calabar
Okon Isoni	Ministry of Environment
Nkor Nathaniel Nkor	Ministry of Agriculture
Andrew Dunn	WCS (NGO)
Dr. Clement Oshaka	CRGIA
Ntufam Innocent Ntuyang	Cross River State Forestry Commission
Bassey Justus Nyony	Cross River State Forestry Commission
John A. Ugbe	Cross River State Forestry Commission
Esther Ekpo Ekpe	Cross River State Forestry Commission

Henry Tiku Takon	Cross River State Forestry Commission
Emo Harrison	Cross River State Forestry Commission
Joseph Ashibekong	Cross River State Forestry Commission
Abba, Kanu	Cross River State Forestry Commission
Atim A. Okon	Cross River State Forestry Commission
Archibong, Clement	Cross River State Forestry Commission
Patrick Ayang	Cross River State Forestry Commission
Glory E. Okon	Cross River State Forestry Commission
Brian Patrick	Cross River State Forestry Commission
Eld. E. B. Ekpenyony	Cross River State Forestry Commission
Felix A. Edim	Cross River State Forestry Commission
Nkeben A.	Cross River State Forestry Commission
Rose E.	Cross River State Forestry Commission
Edem, Fidelia	Cross River State Forestry Commission
Regina Imoke	Cross River State Forestry Commission
Ntun Nkwam E.	Cross River State Forestry Commission
Edu Ikana	Cross River State Forestry Commission
Mary B. Ekpenyong	Cross River State Forestry Commission
Umo, Veronica Effiong	Cross River State Forestry Commission
Effiom E. O.	Cross River State Forestry Commission