EXPERIENCES/ LESSONS LEARNT FROM THE DEVELOPMENT OF A SUB-NATIONAL FOREST REFERENCE LEVEL FOR GHANA

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GHANA'S PROGRESS IN REDD+

- **REDD+ activities commenced in 2008 when Ghana became an FCPF REDD+ Country, Ghana is currently at the stage where:**
  - ❖ readiness phase is well advanced,

  - ❖ targeted investments are being undertaken (under FIP),

  - ❖ an ambitious and pragmatic 20 year National REDD+ strategy has been formulated,

  - ❖ a performance-based Ghana Cocoa-Forest REDD+ Programme (GCFRP) is being developed as a first major step for REDD+ implementation

  - ❖ Ghana has consequently adopted a stepwise approach for the development of its Forest Reference Level commencing from the programme area of the GCFRP i.e. Ghana's High Forest Zone.
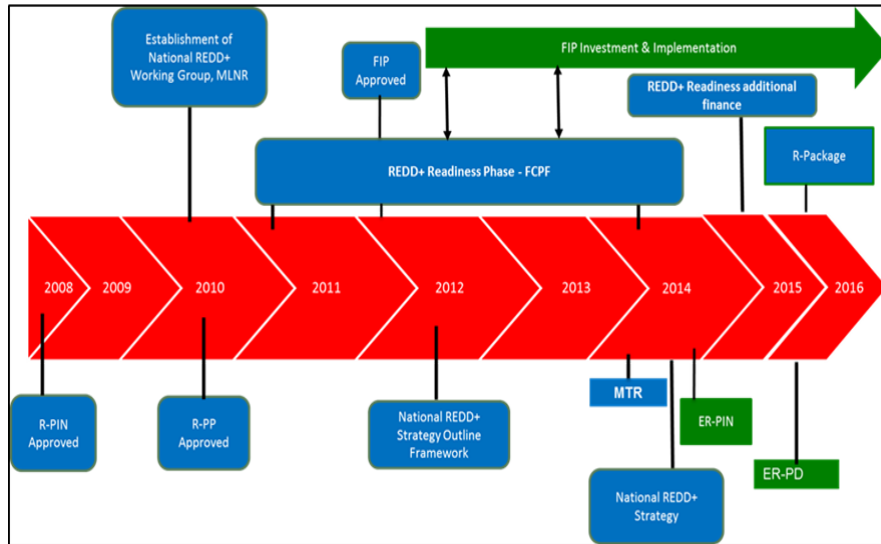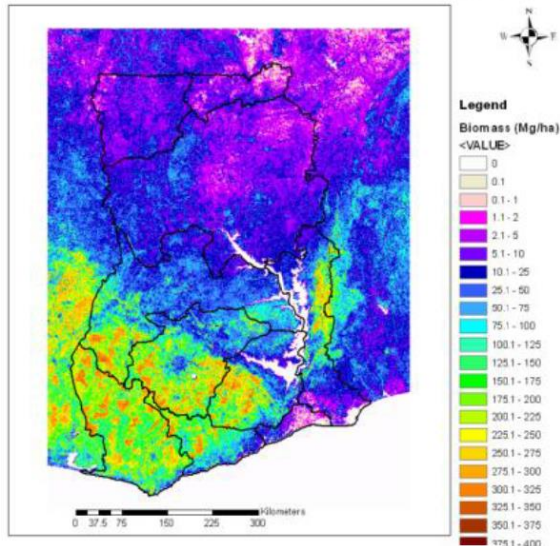

Progress made
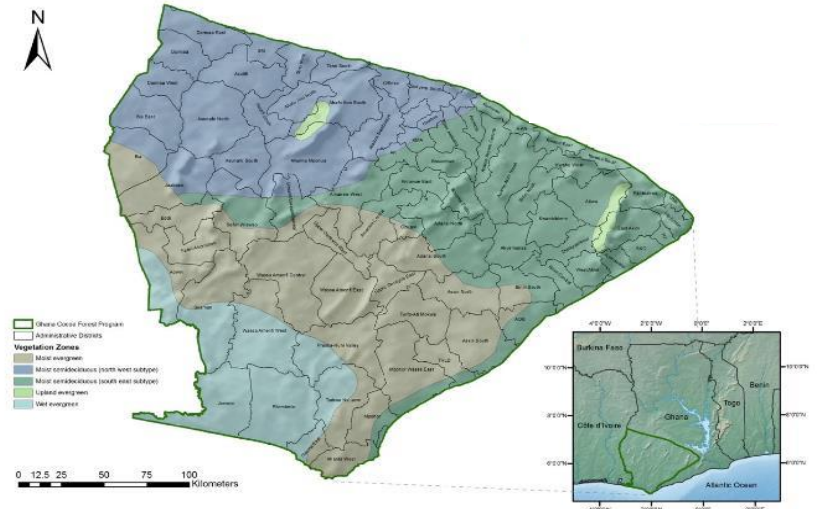
GCFRP Programme Area
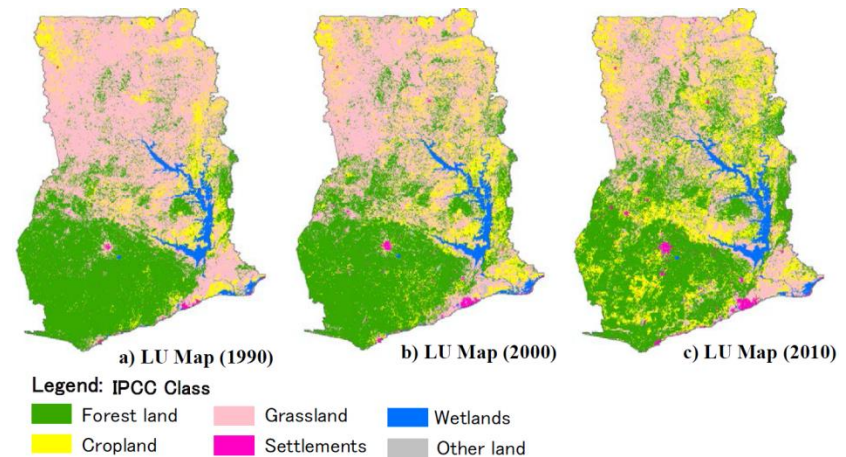
STATUS OF GHANA'S FRL

- Ghana seeks to finalise its **national FRL** by the end of this year for submission to the UNFCCC;

- However, currently Ghana has estimates of its emissions from the High Forest Zone which serves as the programme area of Ghana's Cocoa-Forest REDD+ programme (GCFRP). This sub-national FRL has been submitted to the Carbon Fund for review as part of the GCFRP programme design

- Work towards developing the FRL is building on related-tasks undertaken since 2008

- **Development of a national biomass/ carbon map in 2008/ 2009:**

Biomass Map of Ghana for 2008/2009 (Administrative Boundry)

Legend
Biomass (Mg/ha)
<VALUE>
0
0.1
0.1 - 1
1.1 - 2
2.1 - 5
5.1 - 10
10.1 - 25
25.1 - 50
50.1 - 75
75.1 - 100
100.1 - 125
125.1 - 150
150.1 - 175
175.1 - 200
200.1 - 225
225.1 - 250
250.1 - 275
275.1 - 300
300.1 - 325
325.1 - 350
350.1 - 375
375.1 - 400

- **Wall-to-wall assessment of land use change from 1990 to 2010. Undertaken as part of the Forest Preservation Programme (FPP) from 2012 – 2013. Supported by the Japanese Government.**

a) LU Map (1990)   b) LU Map (2000)   c) LU Map (2010)

Legend: IPCC Class
- Forest land
- Cropland
- Grassland
- Settlements
- Wetlands
- Other land

APPROACH/ METHODS

In developing Ghana's FRL:

1. National Circumstances was well-articulated:
a. National Definition of Forest finalised through a multi-stakeholder process in 2012;
b. Protocols (12 SOPs) were developed to guide data collection for FRL development;
c. Reference Period (2000 – 2015) selected.

2. Key Category Analyses/ Analytical Work:

a. Key Category Analyses undertaken for the selection of REDD+ Activities, pools, and gases to be covered;
b. Combination of Remote Sensing/ Ground-based/ Proxy-based approaches were utilised to determine historical emissions from the selected REDD+ Activities;
c. Annual Average Historical Approach used for future projections.

ACTIVITIES, POOLS AND GASES

REDD+ ACTIVITY	COMPONENTS	CARBON POOLS	GASES
Deforestation	Deforestation	Aboveground biomass, belowground biomass, deadwood, litter, non-tree vegetation, soil carbon stocks.	CO_2, CH_4 and N_2O
Forest Degradation	1. Legal logging 2. Illegal logging 3. Fire 4. Woodfuel extraction.	Aboveground biomass, belowground biomass, deadwood, Harvested Wood Product.	- CO_2 for illegal/ legal logging and woodfuel extraction; - CO_2, CH_4 and N_2O for fire
Carbon Stocks Enhancement	Reforestation in gazetted forest reserves in Ghana	Above- and Below-ground	CO_2

APPROACH AND RESULTS

• Historical reference period for Ghana's sub-national FRL: 2000 – 2015

Deforestation	
Activity Data	Obtained from 2000, 2010, 2013 and 2015 LC maps based on 30m resolution Landsat data. 2000 map utilised to establish time-zero forest extent.
Annual Rate of deforestation during the Reference Period	138,368 ha/yr
Emission Factors	Stock-Difference approach utilised (i.e. difference between pre- and post-deforestation carbon stocks. Estimates done in 2012/3 as part of the FPP.

Carbon Stocks Enhancement	
Activity Data	Average Annual Area planted in forest reserves under the National Forest Plantation Development Programme. Area was discounted by failure rates.
Average area of plantations established per annum in FRs in the programme area	Teak: 1,173 ha/yr Non-teak: 503 ha/yr
Removal Factors	Committed approach used. Based on long term average carbon stocks. Teak = 179 tCO_2/ha; non-teak = 196 tCO_2/ha.

APPROACH AND RESULTS

• Degradation (4 components – legal logging/ illegal logging/ fire/ woodfuel

Degradation from legal logging	
Activity Data	Average volumes of legally harvested logs. Government data
Value	916,396 m³/yr
Emission Factors	Based on Pearson et al (2014). Has 3 components: Extracted Log Emissions (ELE), Logging Damage Factor (LDF) and Logging Infrastructure (LIF). Parameters were estimated from field measurements.
Value	3.75 tCO$_2$/m³

Degradation from illegal logging	
Activity Data	Study undertaken by FORIG/ researchers (Hansen et al) to estimate illegal logging volume
Value	4.1 million m³/yr
Emission Factors	Based on Pearson et al (2014). ELE, LDF estimated for Ghana from field measurements. No LIF for illegal logging
Value	3.25 tCO$_2$/m³

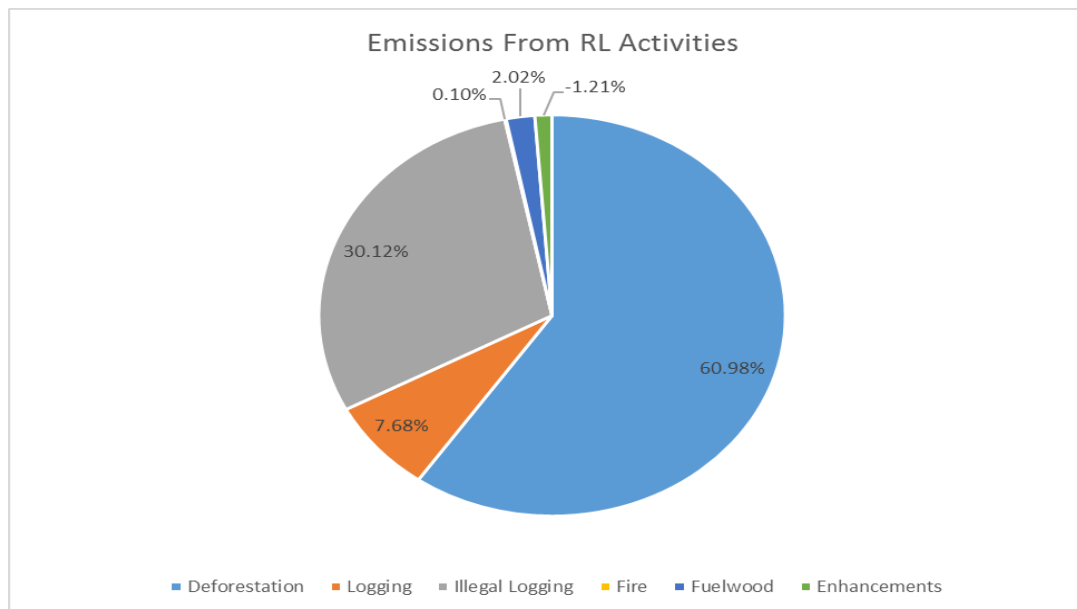| Degradation from fire	
Activity Data	MODIS burned area product.
Value	1,004ha
Emission Factors	3 components: biomass (from FPP); Combustion and emission factors (IPCC default values)

Degradation from woodfuel
Woodfuel Integrated Supply/ Demand Overview Mapping (WISDOM) Model utilised. Model provides an estimate of biomass extracted for woodfuel use in Ghana. Emissions was estimated from the biomass.

RESULTS

PRELIMINARY FRL FOR GHANA'S HIGH FOREST ZONE (SUB-NATIONAL FRL)

Average annual historical emissions from deforestation over the Reference Period (tCO$_{2-e}$/yr)	Average annual historical emissions from forest degradation over the Reference Period (tCO$_{2-e}$/yr)				Average annual historical removals by sinks over the Reference Period (tCO$_{2-e}$/yr)	Reference level (tCO$_{2-e}$/yr)
	woodfuel collection)	legal timber harvest	illegal timber harvest	Fire		
27,285,442	899,499	3,419,024	13,407,000	44,447	538,993	44,516,419

RELATIVE ANNUAL EMISSIONS FROM THE ACTIVITIES

Emissions From RL Activities

- 60.98%
- 30.12%
- 7.68%
- 2.02%
- 0.10%
- -1.21%

Legend: Deforestation, Logging, Illegal Logging, Fire, Fuelwood, Enhancements

LESSONS LEARNT

❖ Developing countries may rely on external expertise during the development of their FRL, consequently there is a need for national capacity strengthening to be incorporated in the process. This approach will ensure that there is in-country capacity to replicate the methodology during the MRV phase;

❖ Activities to be considered in the construction of a Forest Reference Level should be linked to the results of the Key Category Analyses undertaken and also take into cognisance the availability of 'usable' national data for estimating historical emissions;

❖ A step-wise approach is usually recommended for developing FRLs. Improvements can always be made with time. For example, Ghana's FRL development has commenced from the sub-national level;

❖ There is a need for a firm decision on a national definition of forests through a robust multi-stakeholder process;

❖ National buy-in during the development of an FRL is critical. Countries need to take cognisance of the fact that FRL setting has both technical and policy dimensions. The UNFCCC also recommends the TACCC principle.

THANK YOU