StatEO

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Harmonized approach for multi-purpose activity data to support AFOLU policies

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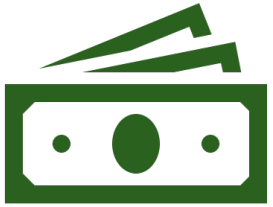
Background

➔ Upper Guinean Forest countries have committed to reduce deforestation and forest degradation including through their Nationally Determined Contributions (NDCs);

➔ The World Bank through various initiatives supports countries hosting Upper Guinean Forests in REDD+ processes and the mobilization of carbon markets related financing;



➔ World bank has mobilized a consortium of experts to support countries in the development of roadmaps, programs ideas and program documentation for reducing emissions due to deforestation and forest degradation.

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SalvaTerra

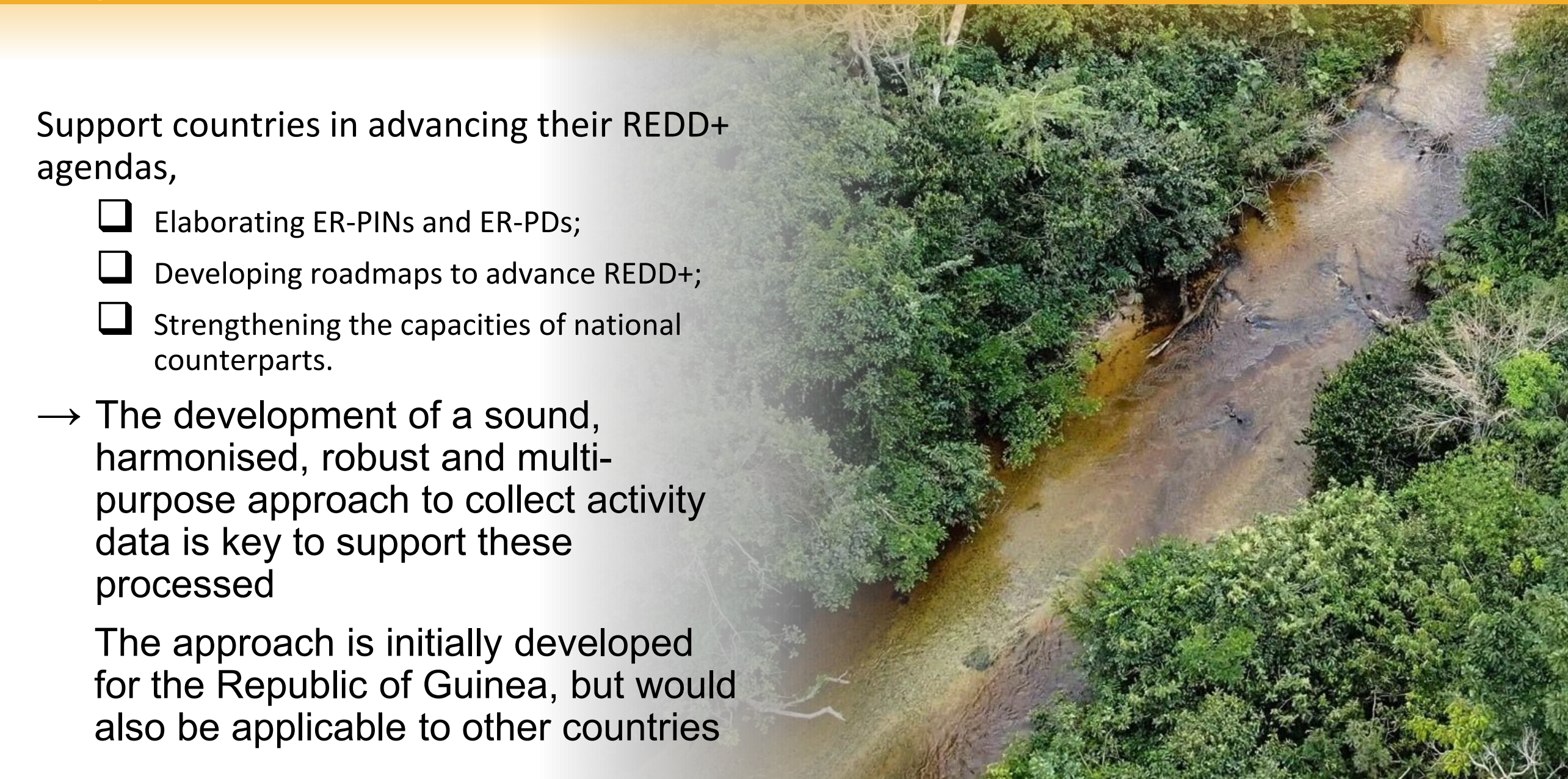
Objectives

Support countries in advancing their REDD+ agendas,

- ❑ Elaborating ER-PINs and ER-PDs;
- ❑ Developing roadmaps to advance REDD+;
- ❑ Strengthening the capacities of national counterparts.

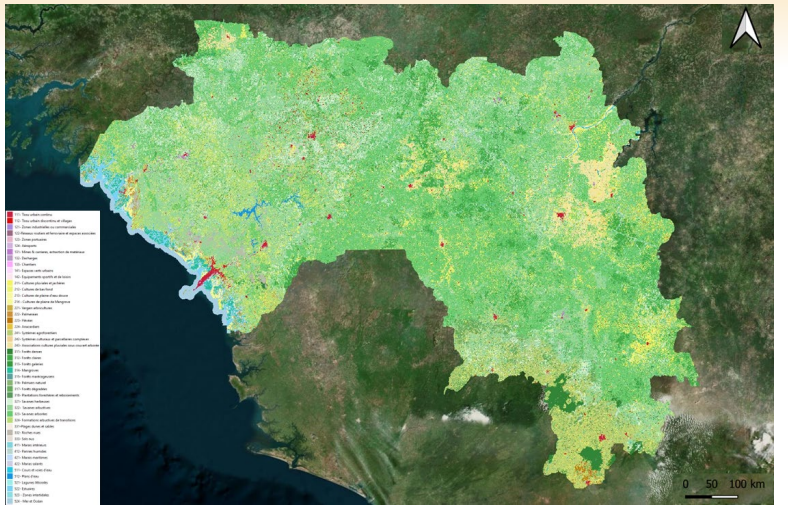
→ The development of a sound, harmonised, robust and multi-purpose approach to collect activity data is key to support these processed

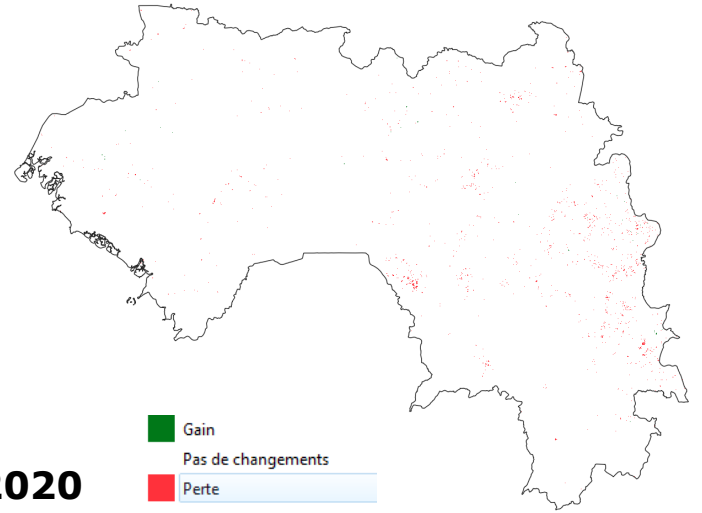
The approach is initially developed for the Republic of Guinea, but would also be applicable to other countries



Stratification and sampling design

- ➔ Main difficulty is to appropriately target changes
- ➔ Land Cover and Forest cover maps available at national level for Guinea for 2015 & 2020, global datasets used for 2025
- ➔ A stratified systematic sampling design was selected with 1km² square as Primary Sampling Units (PSUs)
- ➔ 1km² grid is overlaid over Guinea and statistics extracted from available land cover and forest cover
- ➔ 1km² cells are allocated to Non forest Stable, Forest Stable and change strata based on a specified relevant threshold.

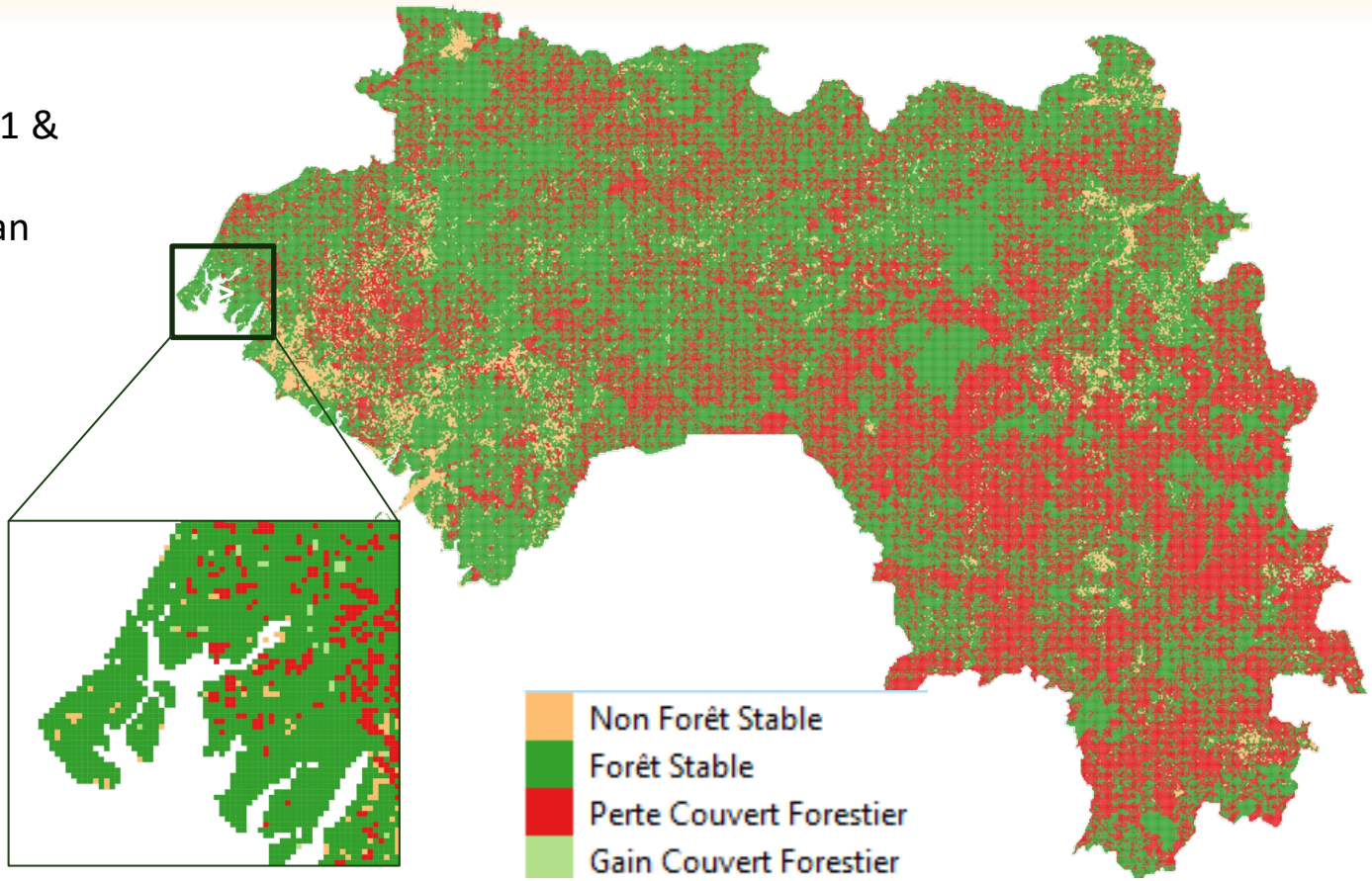




Forest cover Change 2015-2020

Sample Allocation for 2015-2020

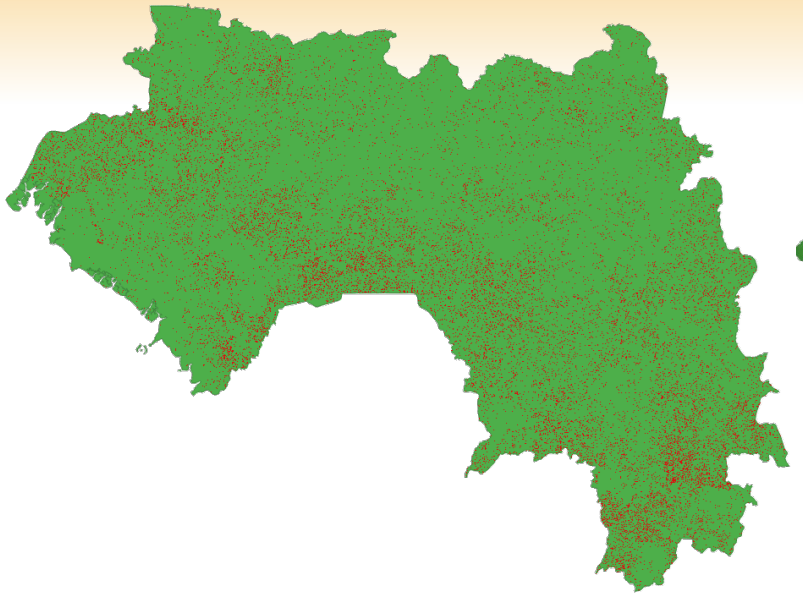
- ➔ Initial Systematic sample of 100 units across the whole of Guinea
- ➔ Assess stratification and apply Neyman optimal Allocation
- ➔ Establish systematic sampling using a kilometer grid (10/11 & 14 km²) to select the desired number of sample units
- ➔ Gain an overview of the main sources of change in Guinean forest cover
- ➔ Optimize the stratification and distribution of samples, avoiding, if possible, omissions of changes in forest cover



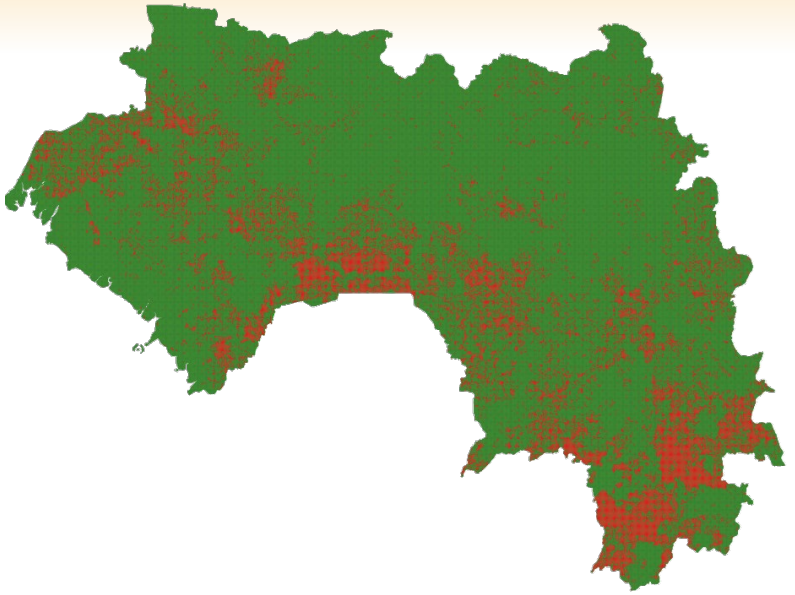
	Nh	n	Var	Var.Nh	Nb Unités
Stable NF	10507	3	0	0	110
Stable F	145030	59	0.00421	610.5831	741
Change*	99389	39	0.006471	643.1275	837
Total	254926	101			1688

*Gain stratum only represents 0,7% of total area and merged with loss stratum

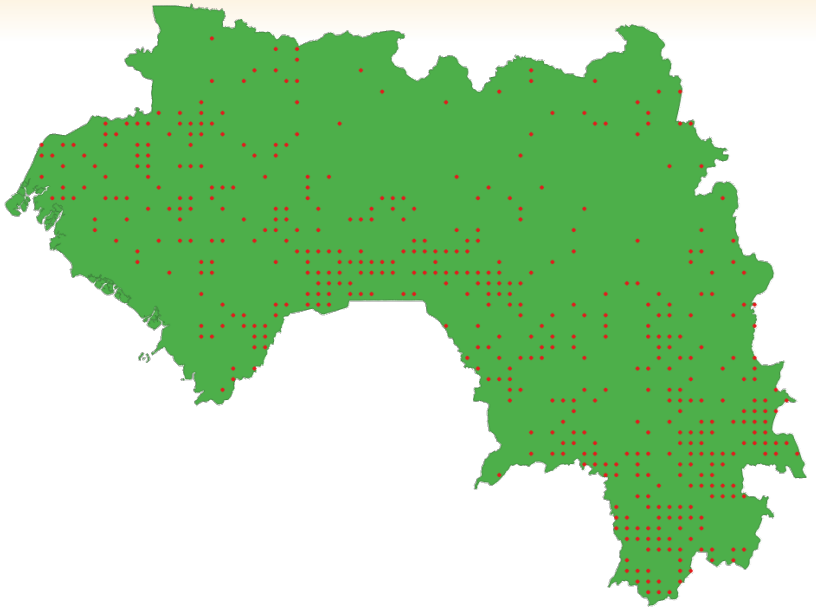
Additional Sampling for 2020-2025



Combination of GLAD RADD and TCDM Alerts between 2020-2025

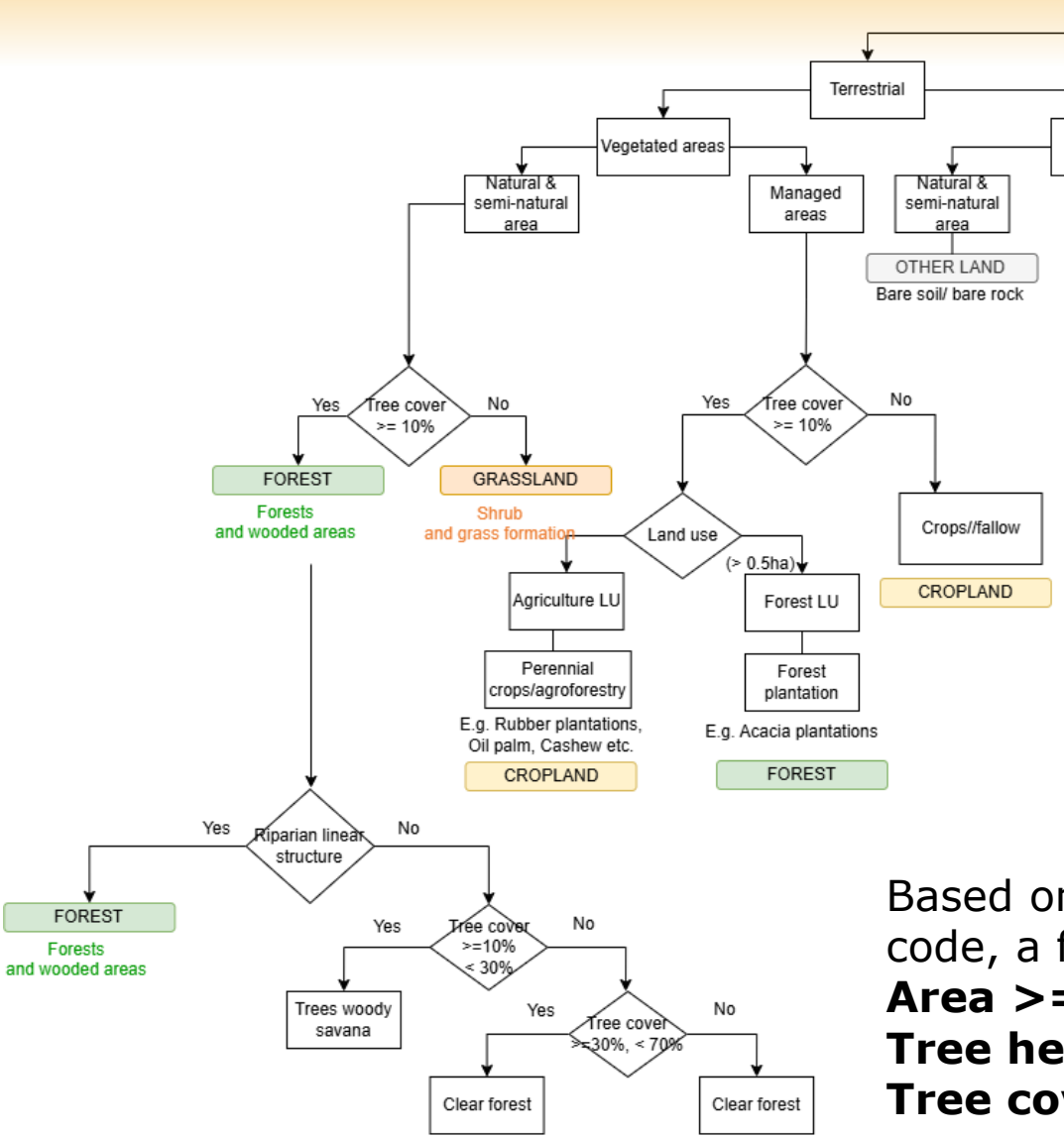


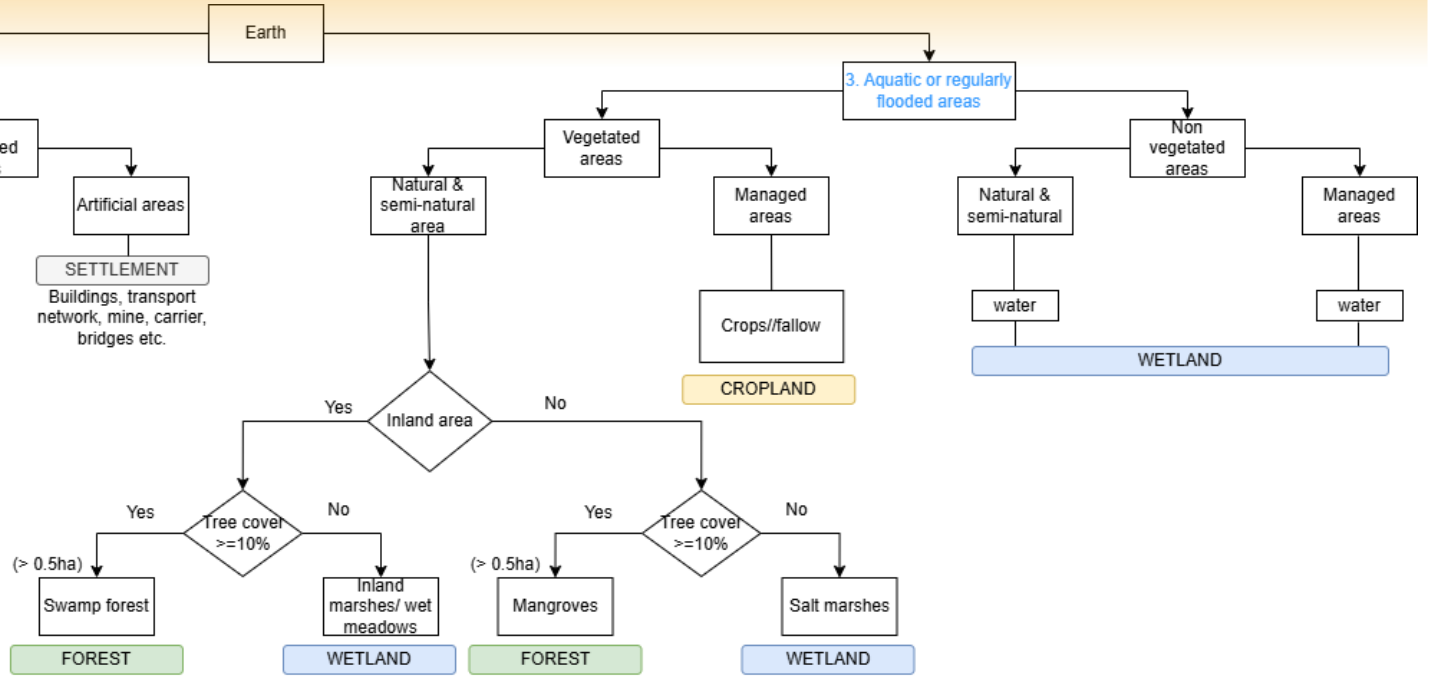
Extraction of zonal statistics over 1km grid and application of 10% change thresholds to create additional change stratum



Application of 11km Systematic grid to select 482 1km² additional Sample units to target 2015-2020 changes

Response Design - Decision trees & Nomenclature





Based on the national forest code, a forest is defined as :

Area >= 0.5 ha,

Tree height >= 5 m,

Tree cover density>= 10%

Code GIEC	Catégories GIEC	Code niveau 1 (ERP)	Légende Niveau 1 (ERP)	Code niveau 2 (GIEC/ERP)	Légende Niveau 2 (ERP)
1	Terres forestières	11	Forêts et formations arborées	111	Forêts denses (d ≥70%)
				112	Forêts claires (30% ≤ d ≤ 70%)
				113	Savane arborée 10% ≤ d ≤ 30%)
				114	Mangroves
				115	Forêts marécageuses
				116	Forêts galeries
2	Terres cultivées	21	Cultures pluviales et jachères	211	Cultures pluviales et jachères
		22	Cultures pérennes et agroforêts	221	Vergers arboricultures
				222	Palmeraies et palmiers naturels
				223	Hévéa
				224	Anacardiers
				225	Agroforêts et autres associations de cultures
				226	Plantations forestières et reboisements
3	Terres humides	30	Eau	30	Eau
		31	Marais intérieurs et marais maritimes	311	Marais intérieurs
				312	Prairies marécageuses
				313	Marais maritimes
4	Etablissements humains	40	Habitat	40	Habitat
		41	Infrastructures routières et surfaces associées	41	Infrastructures routières et surfaces associées
		42	Mines, carrières & chantiers	42	Mines, carrières & chantiers
5	Terres graminéennes (Prairies)	50	Formations / arbustives et herbeuses	50	Formations / arbustives et herbeuses (< 10% d'arbres)
6	Autres terres	60	Sols nus/ roches nues	60	Sols nus/ roches nues

Interpretation of PSUs

Sampling design

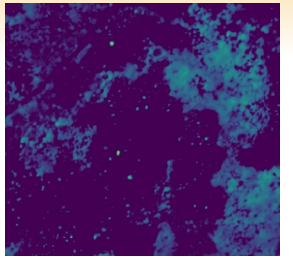
clip

1 km

1 km

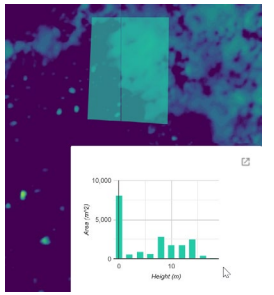
Limite of the forest mask from 2015

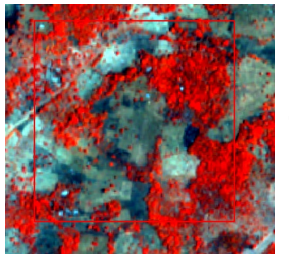
Visual interpretation and digitising of land cover and Identification of changes between 2015-2020 and 2020-2025



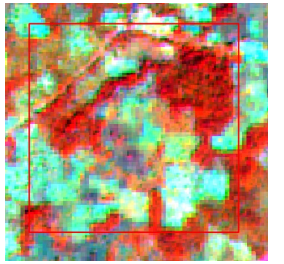
Canopy height 2020

VHR Data and historical VHR data

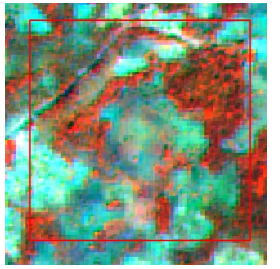




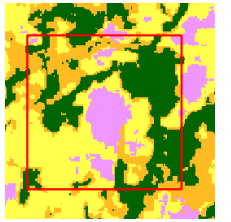
SPOT 6/7 2015



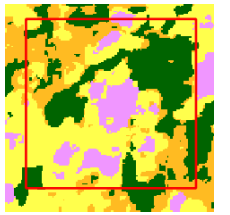
S2 2020



S2 2025



LCFM



ESA 2021

Exemple 1

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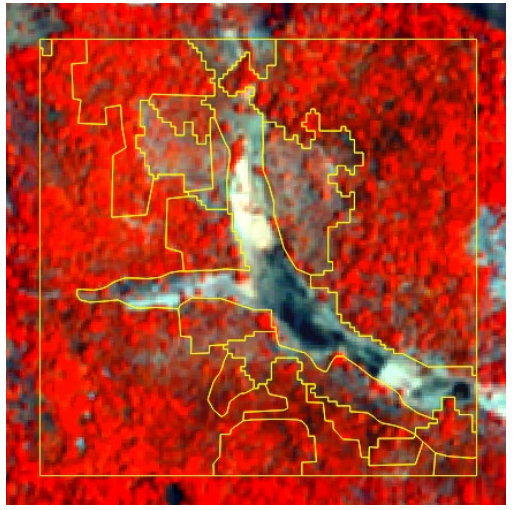

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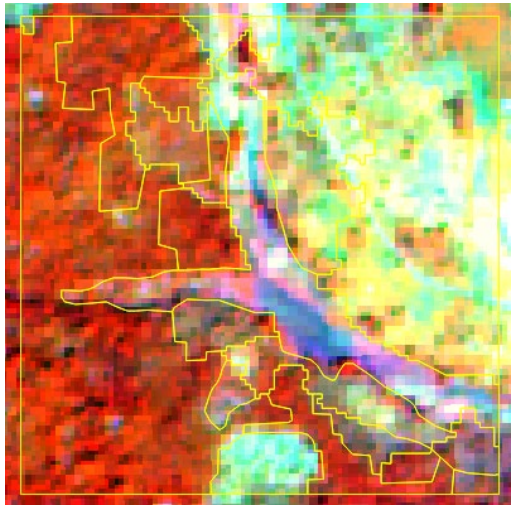

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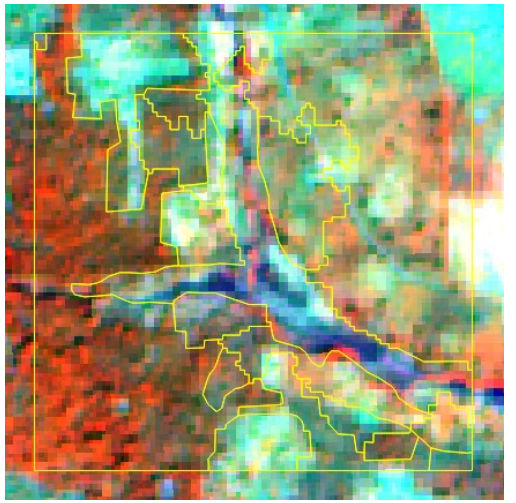

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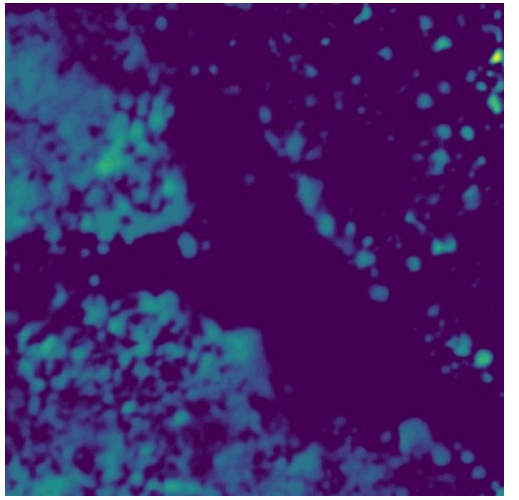
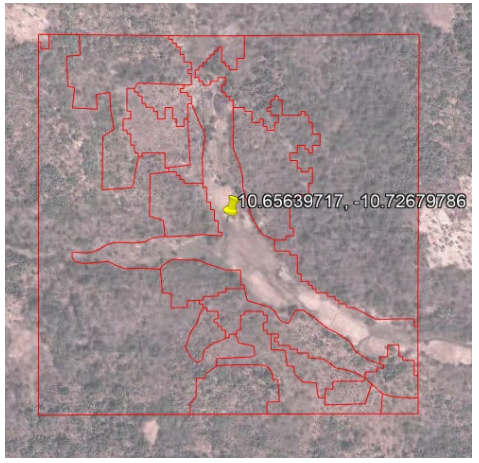
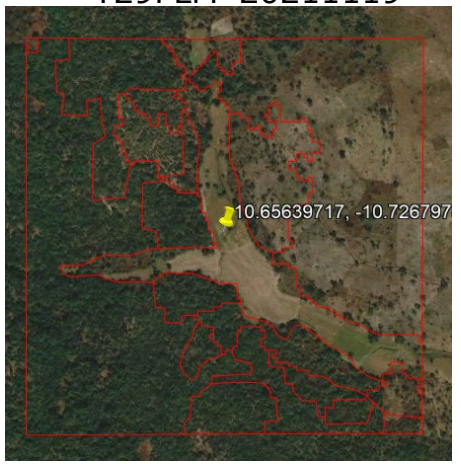


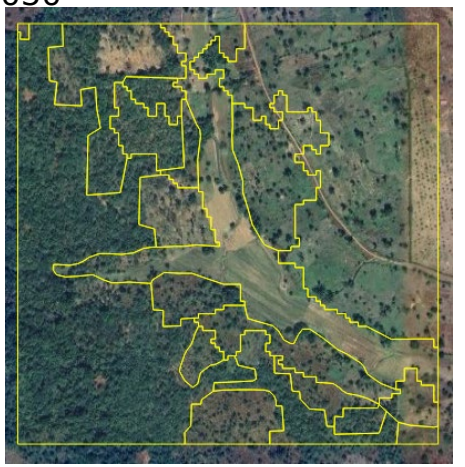
Canopy height 2020



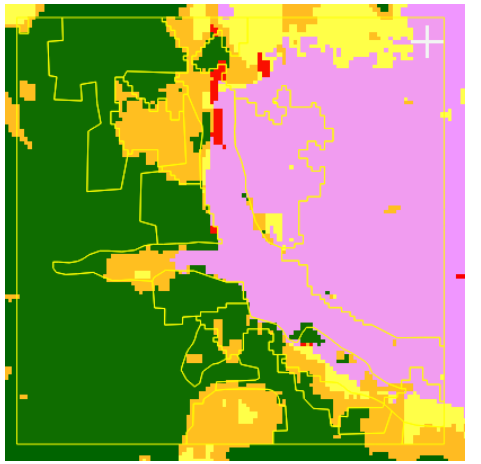
GE 20/01/2012



GE 20/01/2012



GE 19/04/2024

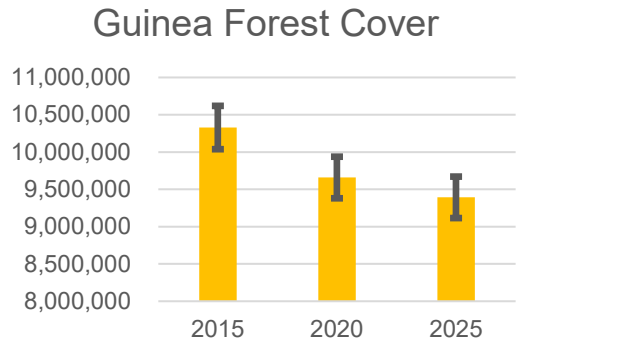


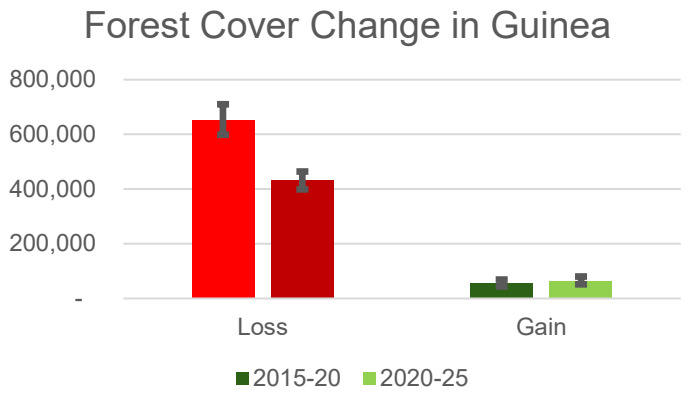
LCFM2020

Analysis & Results

- Standard stratified estimator is applied
- Forest cover represent around 40%of Guinea
- Detailed area & change estimates per land cover type
- Average deforestation > 1% for 2015-20 and < 1% for 2020-25

(ha)	Couvert Forestier			2015-20		2020-25	
	2015	2020	2025	Loss	Gain	Loss	Gain
Estimate	10.328.757	9.659.006	9.392.977	654.404	56.374	431.585	66.026
CI90	290.482	278.777	278.122	55.823	12.814	32.644	14.281
CV90CI	2,8%	2,9%	3,0%	8,5%	22,7%	7,6%	21,6%





			2020																					
Area Estimates (ha)			Forêts denses (d ≥70%)	Forêts claires (30% ≤ d ≤ 70%)	Savane arborée 10% ≤ d ≤ 30%)	Mangroves	Forêts marécageuses	Forets galeries	Cultures pluviales et jachères	Vergers arboricultures	Palmeraies et palmiers naturels	Hévéa	Anacardiers	Agroforêts et autres associations de cultures	Plantation forestière	Eau	Marais intérieurs	Prairies marécageuses	Marais maritimes	Habitat	Infrastructures routières et surfaces associées	Mines, carrières & chantiers	Formations / arbustives et herbeuses (< 10% d'arbres)	Sols nus/ roches nues	TOTAL AREA (ha)
			111	112	113	114	115	116	211	221	222	223	224	225	226	30	311	312	313	40	41	42	50	60	
2015	Forêts denses (d ≥70%)	111	363.904	501					2.129											77			3.315		369.925
	Forêts claires (30% ≤ d ≤ 70%)	112		2.924.369	3.820				96.538				2.291					76		391	82	28	41.668		3.069.263
	Savane arborée 10% ≤ d ≤ 30%)	113		2.879	5.776.452				321.174				9.692			481		118		283	1.494	5.301	146.338		6.264.212
	Mangroves	114				124.572			1.190							9			1.786						127.556
	Forêts marécageuses	115					4.633																		4.633
	Forêts galeries	116						491.407	3.115				102				848	1.447			124	79	193		497.315
	Cultures pluviales et jachères	211			5.583				2.184.525		4.983	1.908	25.730	1.974	10	3.008			10.330	3.593	392	2.294	343.139		2.587.468
	Vergers arboricultures	221								18.748										141					18.890
	Palmeraies et palmiers naturels	222							2.398		232.867									2.163	1.162	512	764		239.866
	Hévéa	223										25.809													25.809
	Anacardiers	224							317				120.361										349		121.027
	Agroforêts et autres associations de cultures	225							5.246					455.885						6.808	458		5.616		474.013
	Plantations forestières et reboisements	226													23.000								1.316		24.315
	Eau	30														129.139									129.139
	Marais intérieurs	311							1.110		40					1.543	61.314								64.007
	Prairies marécageuses	312							1.343		109							179.346			44	688	270		181.800
	Marais maritimes	313				296													42.490						42.786
	Habitat	40																		249.565		4.020			253.585
	Infrastructures routières et surfaces associées	41														364					27.951				28.315
	Mines, carrières & chantiers	42														653						9.320	84		10.057
	Formations / arbustives et herbeuses	50		4.129	47.738				671.266	629	9.341	7.638	46.125	10.139	3.155	5.142				8.645	7.635	32.982	9.972.920	1.973	10.829.458
	Sols nus/ roches nues	60														3.033						285	605	125.207	129.129
	TOTAL AREA (ha)		363.904	2.931.878	5.833.593	124.868	4.633	491.407	3.290.351	19.377	247.339	35.355	204.301	467.999	26.165	143.372	62.162	180.987	54.606	271.666	39.342	55.508	10.516.576	127.180	25.492.568

Main findings

- Approach successfully applied in Guinea
- Detailed area and area change estimates are available for multiple landcover changes
- Forest cover change estimate with uncertainty < 10% over 5 year
- The whole approach is fully documented and can be applicable elsewhere
- Can be used as input to LULUCF reporting and access to carbon finance