

Using Ecosystem Accounting For Nature Policies: Lessons from Ghana

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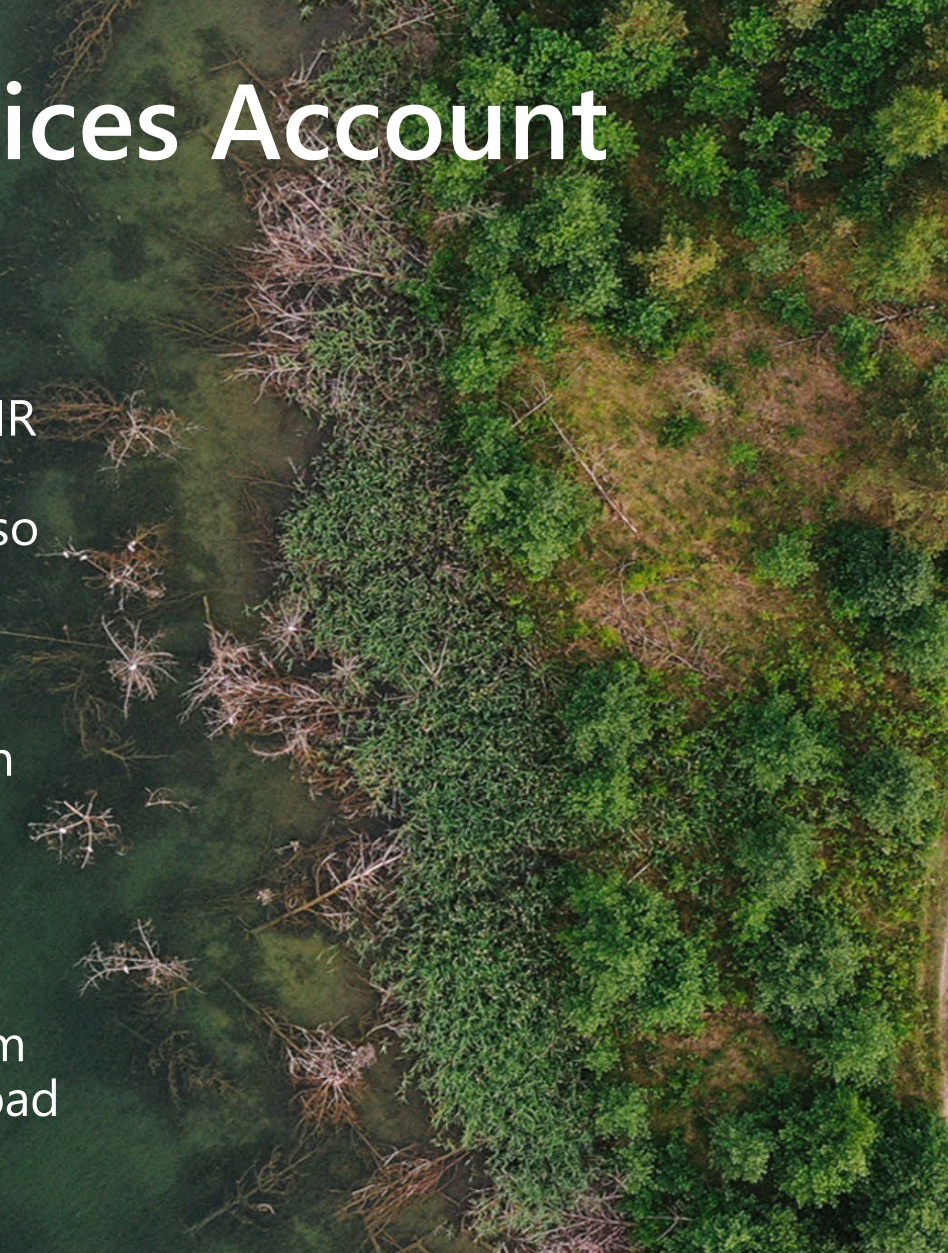


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Land, Ecosystem Extent & Services Account

- Developed using the United Nations System of Environmental-Economic Accounts (SEEA) Central Framework as a guide.
- Used existing land cover maps for 2015, 2019 and 2021 (10m Resolution).
- The Ecosystem Accounts were compiled by three (3) Sub-Working Groups (SWG)
- Representatives drawn from eight (8) Ministries, Departments and Agencies (MDAs) with technical support from the World Bank and the United Nations Statistical Division (UNSD).
- A map developed for the Red List of Ecosystems assessment (National Biosafety Authority & CSIR 2020) as part of the CONNECT project was also used.
- A 1990 baseline map representing the situation before large-scale agricultural or industrial activities was used.
- Consists of 272 ecosystem types nested within 9 broad ecosystem categories.



Land Accounts (2015/2021)



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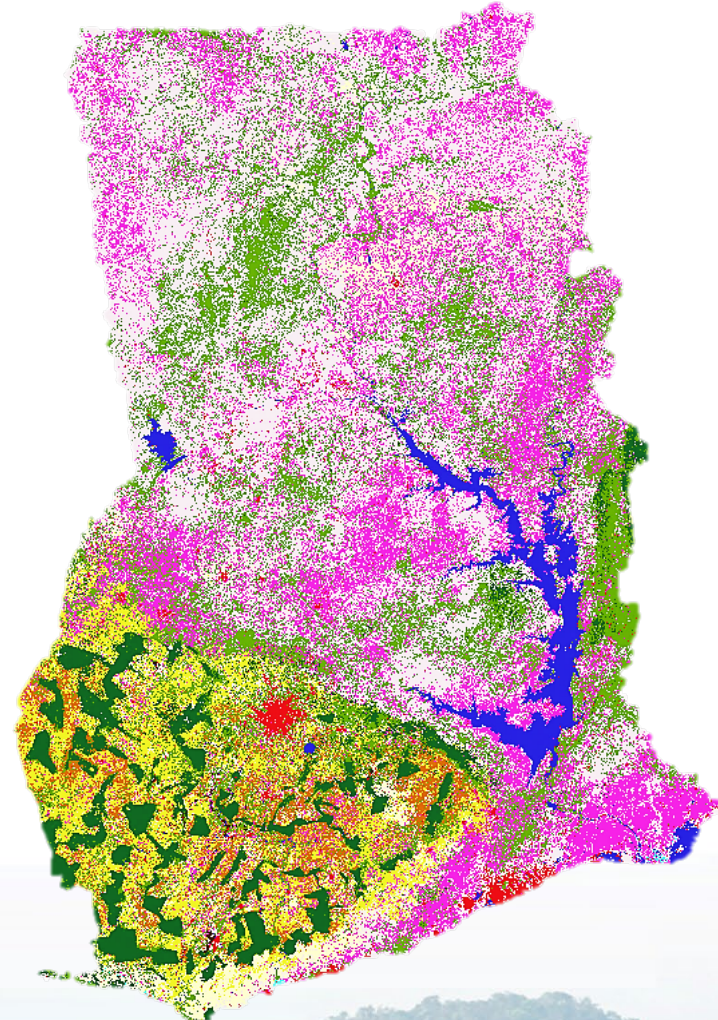
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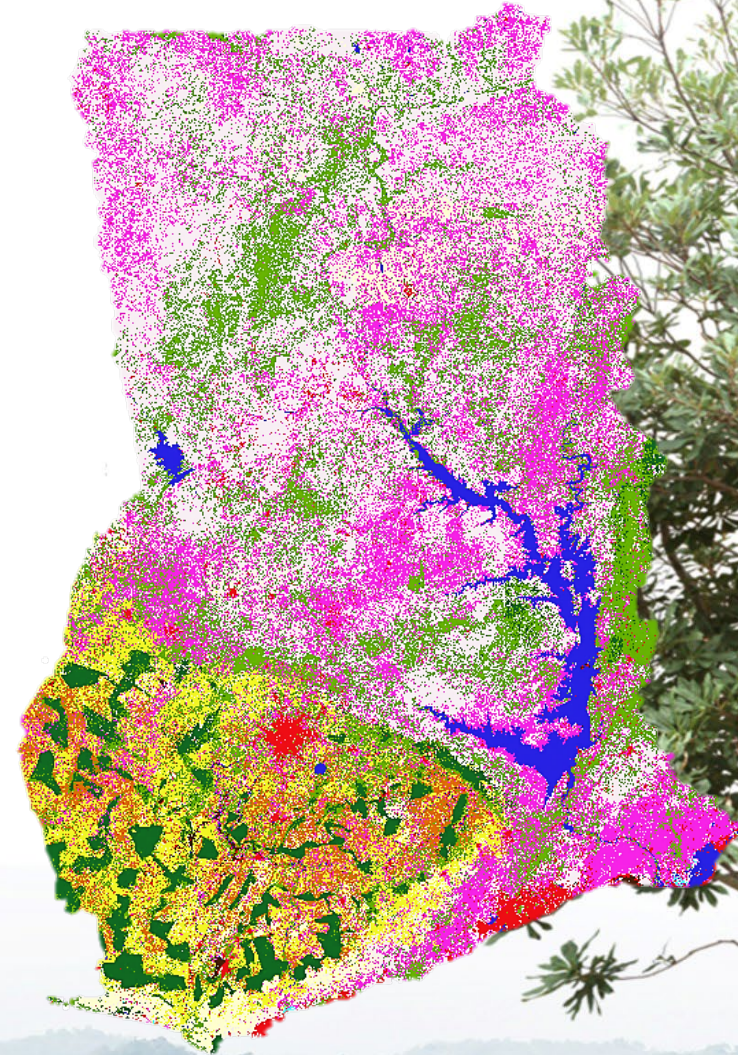
Land Cover Maps

Legend

- Closed forest
- Open forest
- Water
- Grassland
- Settlement
- Mono cocoa
- Shaded cocoa
- Other tree crop
- Food crop
- Bare surface
- Mangroves



2015



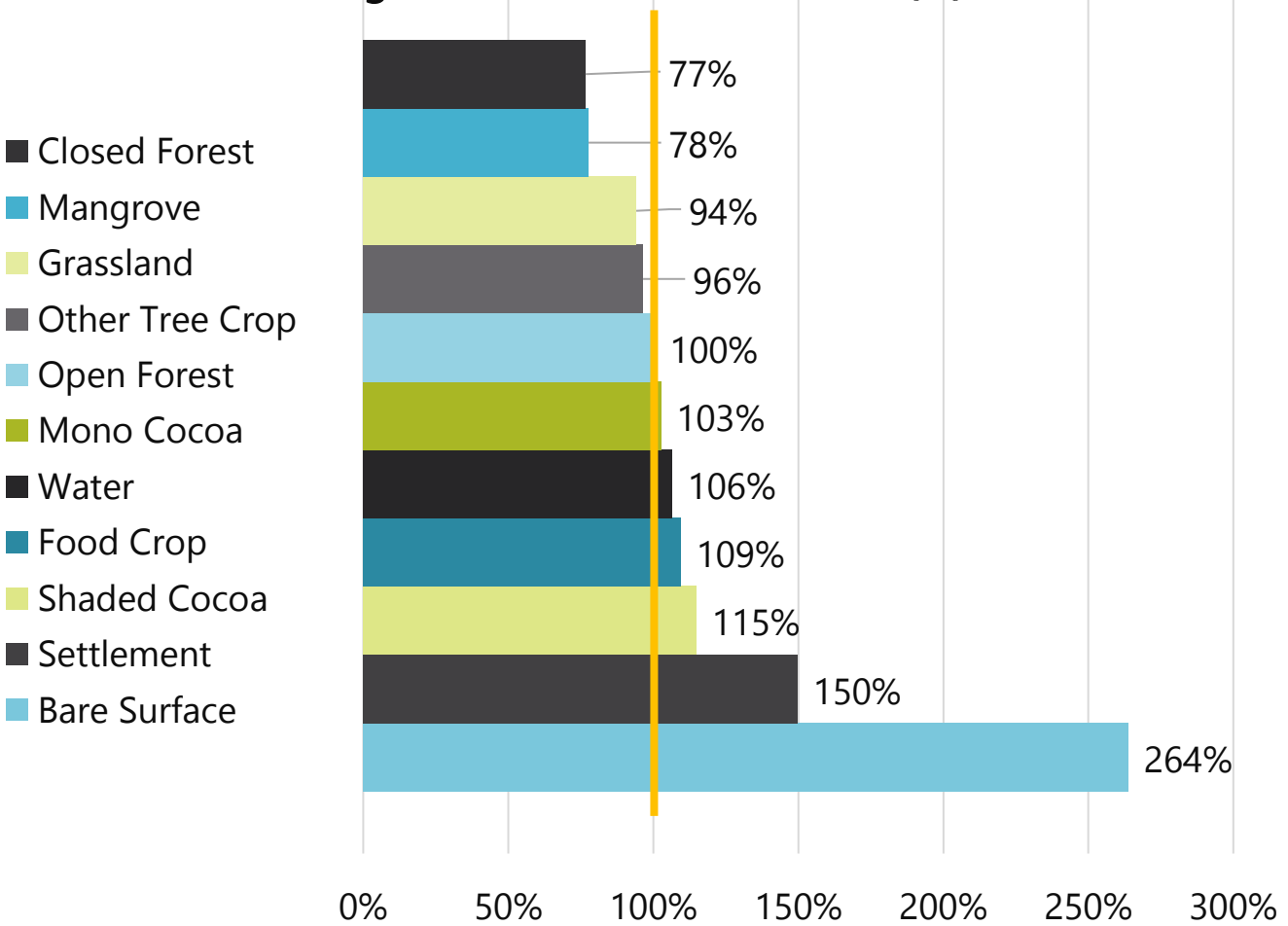
2021



Trends in Key Land Cover (2015 – 2021)

- > 20 % reduction in closed forest + mangroves
- > 250 % increase in bare land
 - > Due to mining activity (e.g., Galamsey)
- 50 % increase in settlement
 - > Due to urbanization
- Expansion in agricultural land use
 - > Shaded cocoa >> Mono cocoa
 - > Agroforestry policies at work

Change in Land Cover 2021/2015 (%)



Land Degradation (UNCCD / SDG 15.3.1) - National

2021												
Land Cover (km ²)	Closed Forest	Open Forest	Water	Grassland	Settlement	Mono Cocoa	Shaded Cocoa	Other Tree Crop	Food Crop	Bare Surface	Mangrove	Total
Closed Forest	10,995	2,113	6	362	23	523	101	141	201	13	0	14,477
Open Forest	3	40,232	73	723	0	753	161	431	1,251	139	0	43,767
Water	0	0	7,075	82	-	4	0	4	1	152	1	7,319
Grassland	92	1,539	561	80,508	1,760	337	48	510	2,273	82	4	87,714
Settlement	-	-	-	-	4,493	-	4	0	0	0	0	4,497
Mono Cocoa	-	-	5	-	-	15,684	655	580	950	83	0	17,957
Shaded Cocoa	-	-	1	-	-	-	6,313	-	158	10	-	6,482
Other Tree Crop	-	25	4	846	-	848	113	9,030	719	48	-	11,633
Food Crop	-	-	23	2	458	289	48	517	42,969	8	-	44,313
Bare Surface	0	0	47	-	-	3	0	1	0	243	-	294
Mangrove	0	3	-	10	0	3	0	8	0	0	63	87
Total	11,091	43,912	7,794	82,532	6,734	18,444	7,445	11,223	48,522	776	68	238,540

Land Degradation (UNCCD / SDG 15.3.1) – Sub-national

- Land accounts disaggregated to **the regional level and selected forest reserves** to deepen the analysis.
 - Subnational accounts for **watersheds and districts**.
 - Differences between the regions in landscape stability **Ahafo region - 24% conversion in its land cover and has the highest land degradation of almost 17%.**
 - **Upper East region has a stability of more than 98% and land degradation of less than 1 %.**
 - The main factors of change **are changes from a natural land cover type to a human-modified land cover type.**
- **Closed forest to open forest** occurs most frequently (5 instances), an indication of forest degradation.
 - In the **Savannah, Central and Western regions**, conversions between **agricultural land use** are the main factors of land conversion.
 - Two (2) selected forest reserves - **Atewa and Tano Offin** were of interest. **Atewa has experienced a very stable land cover of almost 98 %**, and **Tano-Offin had a lower stability of only 86 % with high land degradation of 13.5 %.**
 - The predominant change in both reserves was from **closed forest to open forest.**

Summary of Key Policy Uses

- The land accounts used for assessing **subnational development** i.e., used indicators from the regional land accounts to rank and compare regions or districts on progress in maintaining the forest cover.
- Inform the effectiveness of forest, wildlife, and agro-commodity policies and strategies.
- Land-use planning and monitoring of landscape restoration i.e., GLRSSMP, etc.

Ecosystems Extent Accounts (1990/2021)



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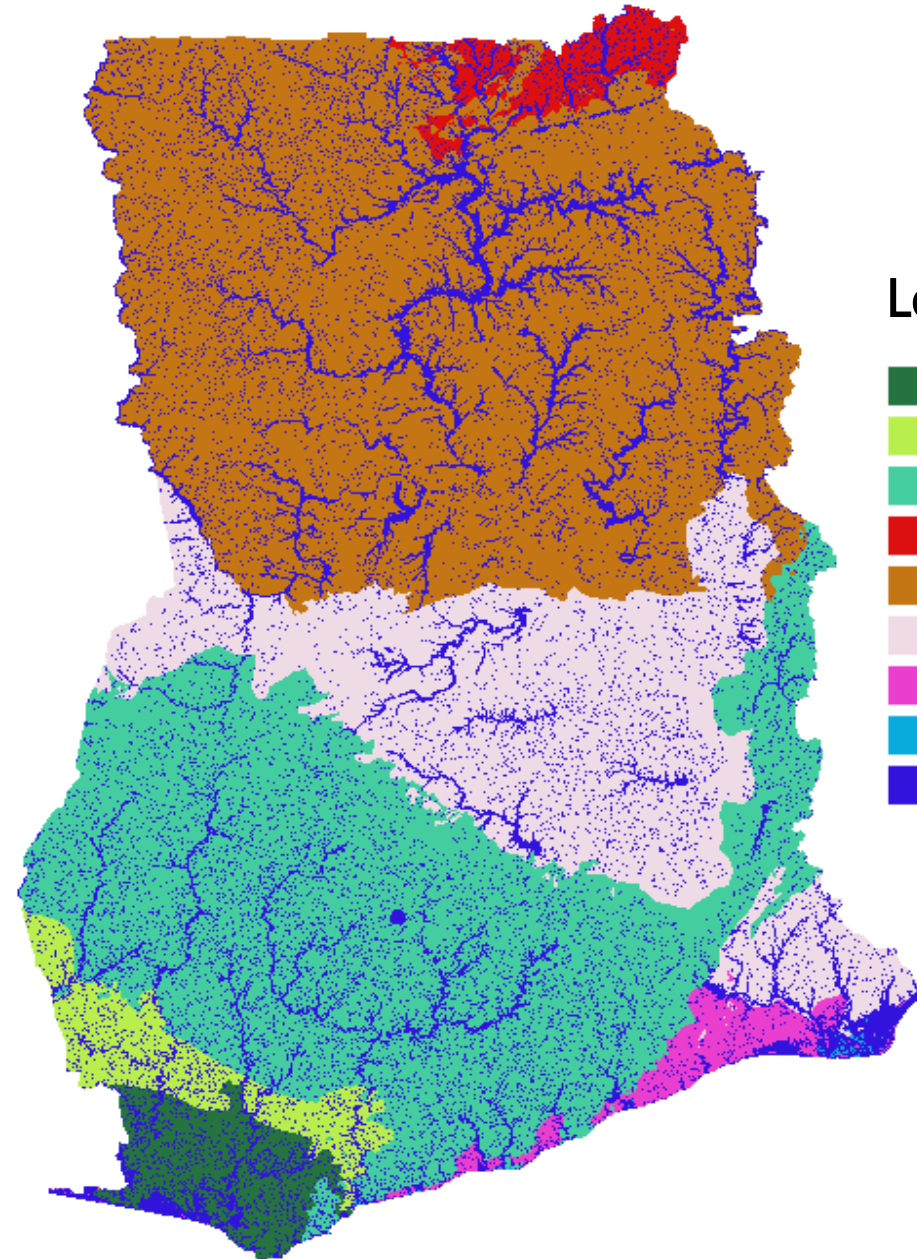


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EEA Baseline Map

- Change is tracked from a baseline onwards in successive accounting periods.
- The baseline is stable – it changes only if there's improved accuracy.
- Map from the CONNECT project was used as historic baseline -> which represents the best estimate of the natural occurrence of ecosystem types, prior to major human modification
- Links 1-1 (mostly) to IUCN Global Ecosystem Typology



Legend

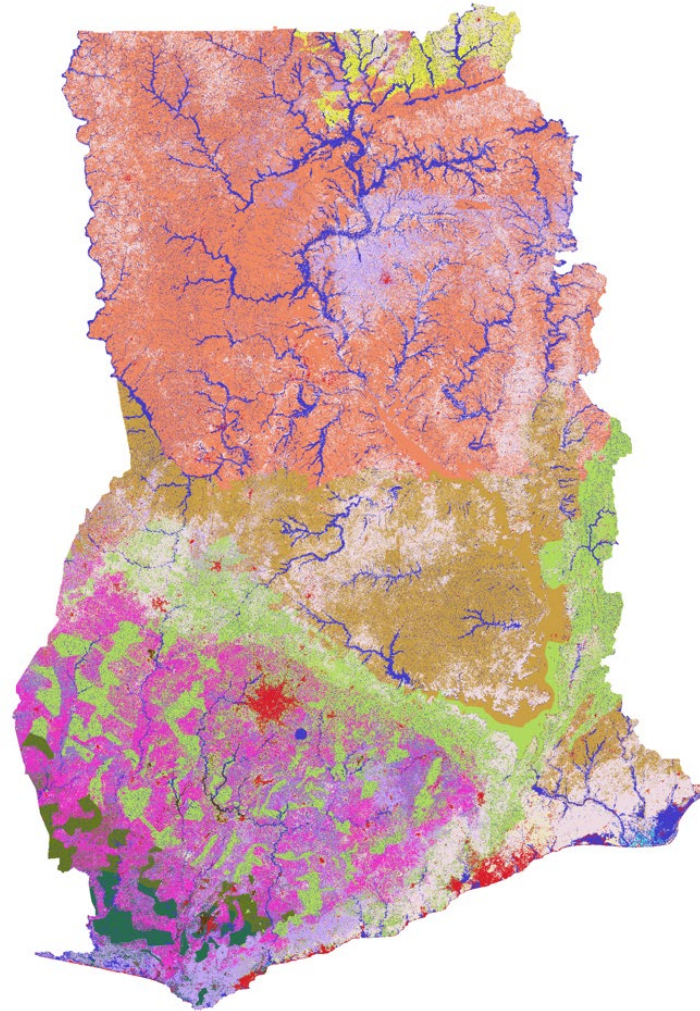
- Tropical rainforest wet
- Tropical rainforest moist
- Moist semi-deciduous forest
- Sudan savanna woodland
- Guinea savanna woodland
- Guinea transitional woodland
- Coastal scrub and grasslands
- Mangroves
- Wetlands, rivers and riparian

Ecosystem Extent 2015 and 2021

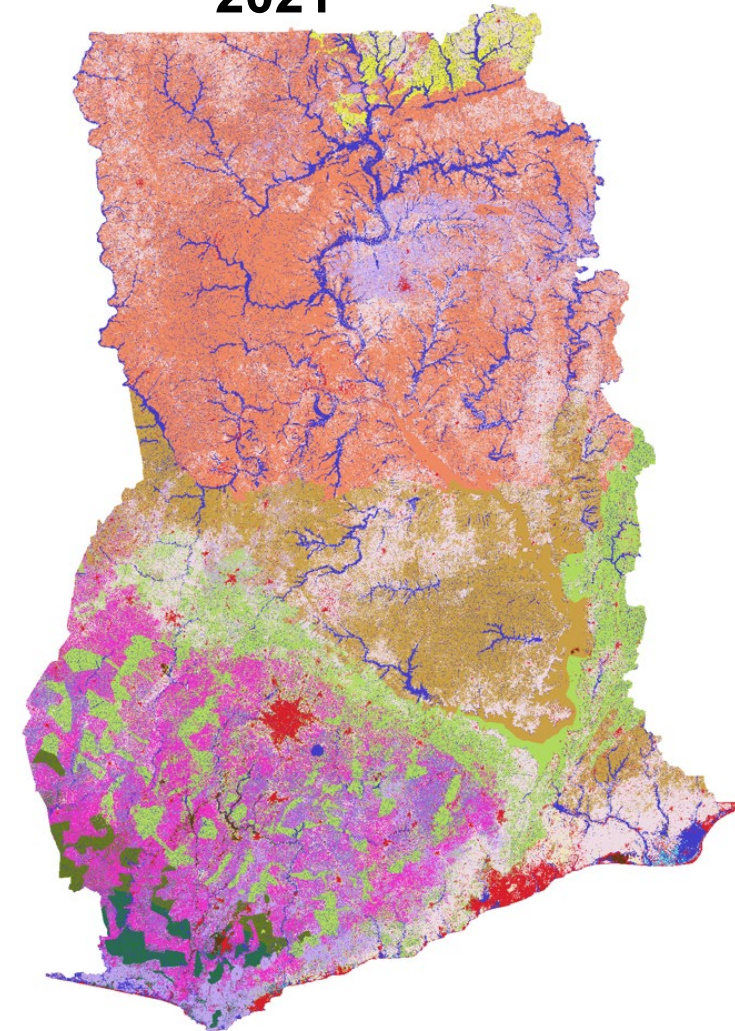
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2015



2021



RESULTS & FINDINGS: EEA (1990/2021)

- **Only 29% of original extent** remaining in coastal scrub and grassland.
- Tropical rainforest ecosystem types -> **about 40% remaining.** During 1990-2015 undergone major reductions in extent
- EEA allows for reporting towards the Post 2020 Global Biodiversity Framework - Goal A.
- Extent of natural ecosystems was **64.3% in 2015** and dropped to **60.9% in 2021.**

POLICY USES & RECOMMENDATIONS

- Ghana has experienced **large increases in human-modified ecosystem types.**
 - By extrapolating the average annual trend in reductions of natural ecosystems that occurred over the last 30 years, **tropical rainforests (wet and moist) will disappear in about 20 years**, urging the importance of further conservation measures.
- The ecosystem extent account **provides quantitative data for updating the National Biodiversity Strategy and Action Plan (NBSAP)**, indicating which ecosystems are threatened.
- Information from the ecosystem extent account **supports the national monitoring and reporting on the Kunming-Montreal Global Biodiversity Framework, specifically Goal A** on the extent of natural ecosystems.
- This headline indicator is the total remaining natural extent across all ecosystems which **87.7 % in 1990** but **dropped to 64.3% in 2015** and **60.9% in 2021.**

Ecosystems Services Accounts (2015/2021)



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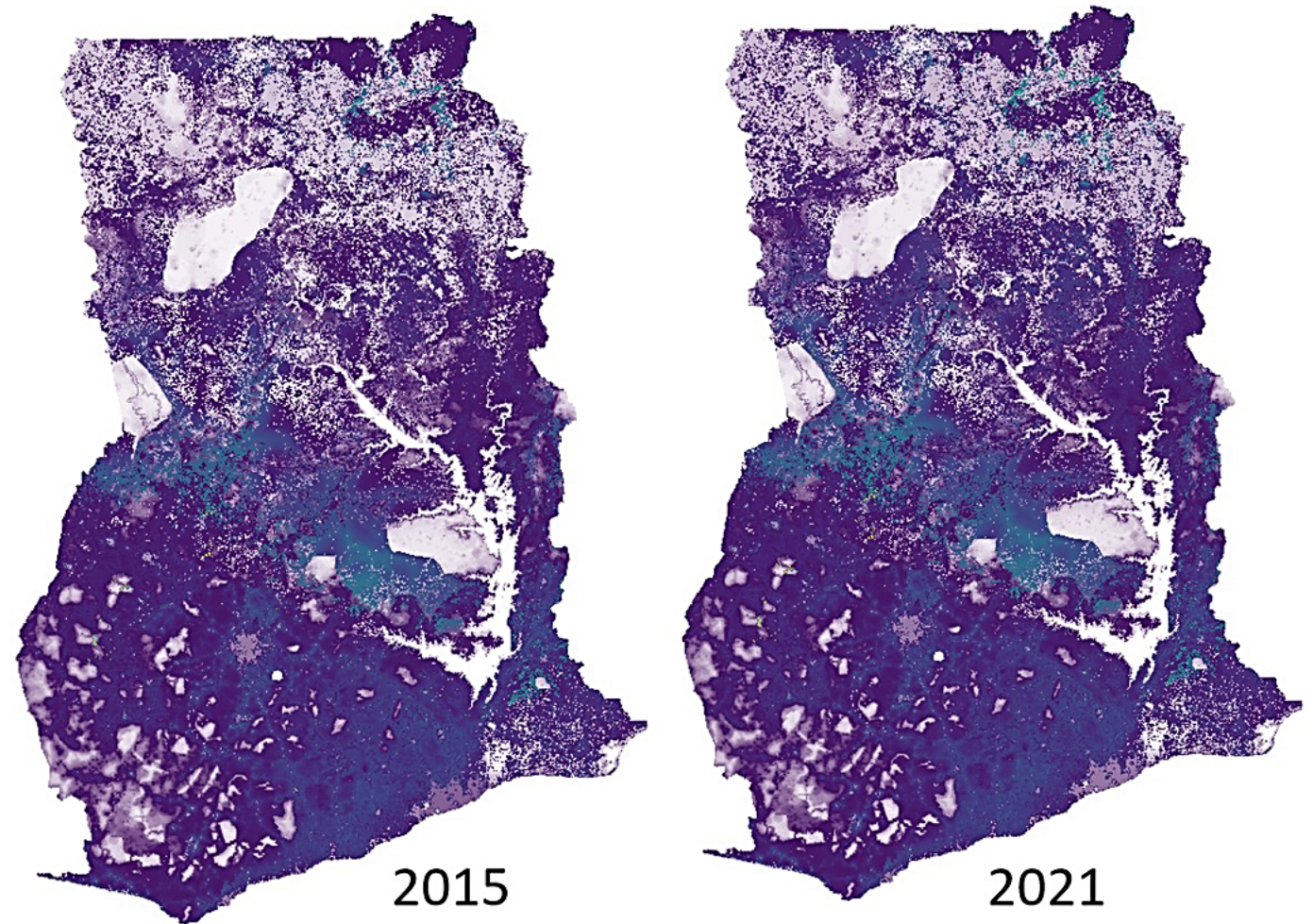


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PROVISIONING SERVICES - WOODFUELS (2015 - 2021)

- The (physical) ecosystem service consist of modeled woodfuels supply in metric tons per cell (500m²)
- The data are for approximately 2021, as the 2021 Population Census was primary input
- For 2015, linear interpolation of 2010-2021 trend on number of households depending on fuelwood for each of the 16 regions
- **Results:** increase in woodfuels consumption of 5.8 % between 2015 and 2021



CARBON RETENTION/GLOBAL CLIMATE REGULATION

- Applies FREL data + additional coefficients in combination with land cover maps
- Findings:
 - > Loss in carbon storage of 2.6 % between 2015 and 2021
 - > With price of 7.5 \$ tCO₂-> 1,154 million USD in 2021

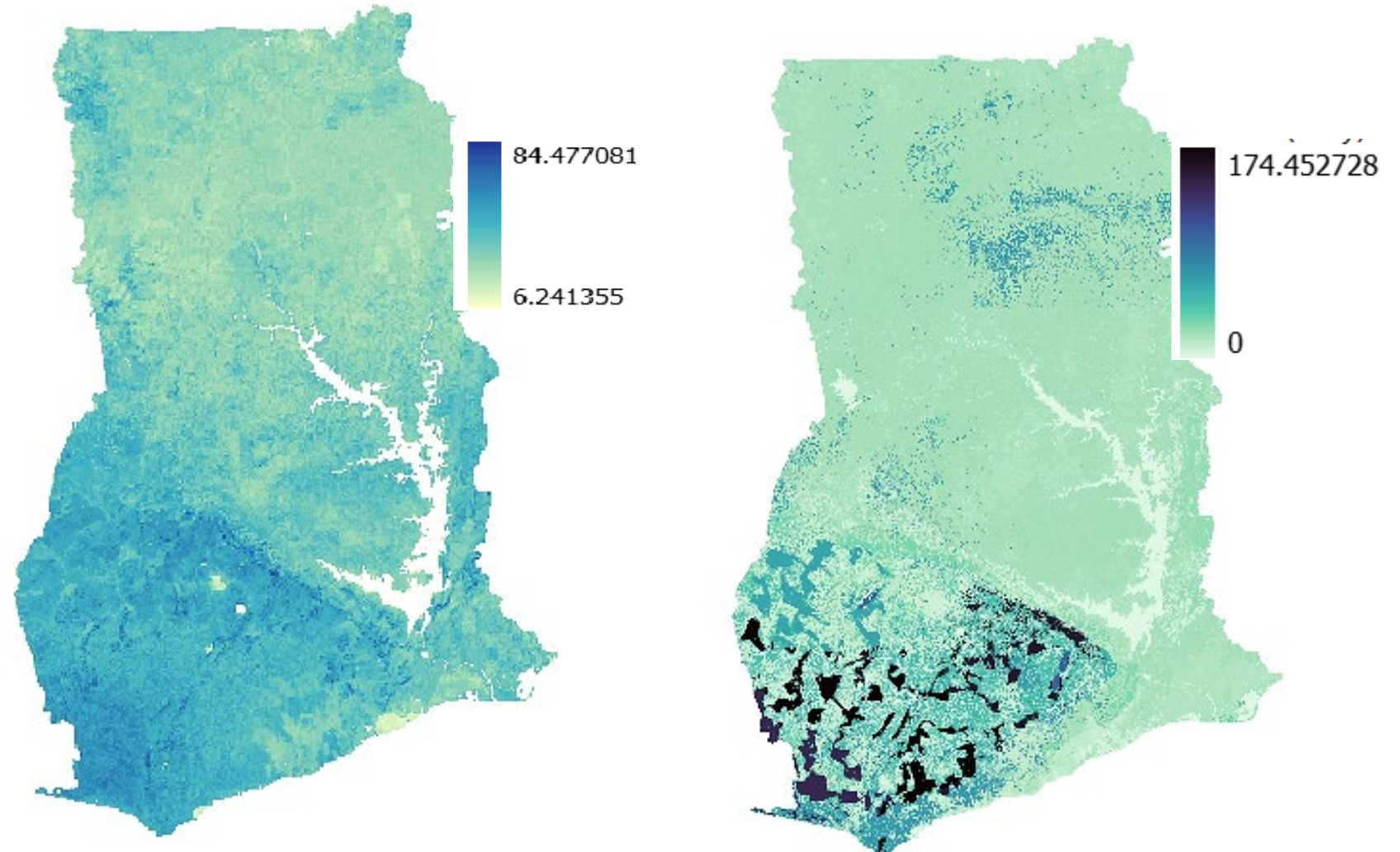


Figure: LEFT: Soil Organic Carbon (0-30 cm); RIGHT Vegetational carbon (tC/ha)

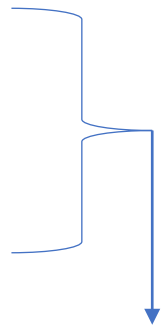
ECOSYSTEM SERVICES ACCOUNT (ESA) – ONGOING WORK

- Provisioning services

- > Timber
- > Woodfuels
- > Non-timber Forest Products
 - Wildlife trade
 - Medicinal plants

- Regulating services

- > Carbon / Global climate regulation
- > Water flow regulation
- > Water filtration +
- > Sediment retention



Soil & Water Assessment Tool (SWAT) Modeling

POLICY USES

- Land use planning:
 - Inform district land use planning
 - Plan landscape restoration interventions
 - Prioritize conservation areas or areas for Payments for Ecosystem Service targeting
- Trade-off analysis / Cost-Benefit Analysis



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