

Using Ecosystem Accounting For Nature Policies: Lessons from Ghana

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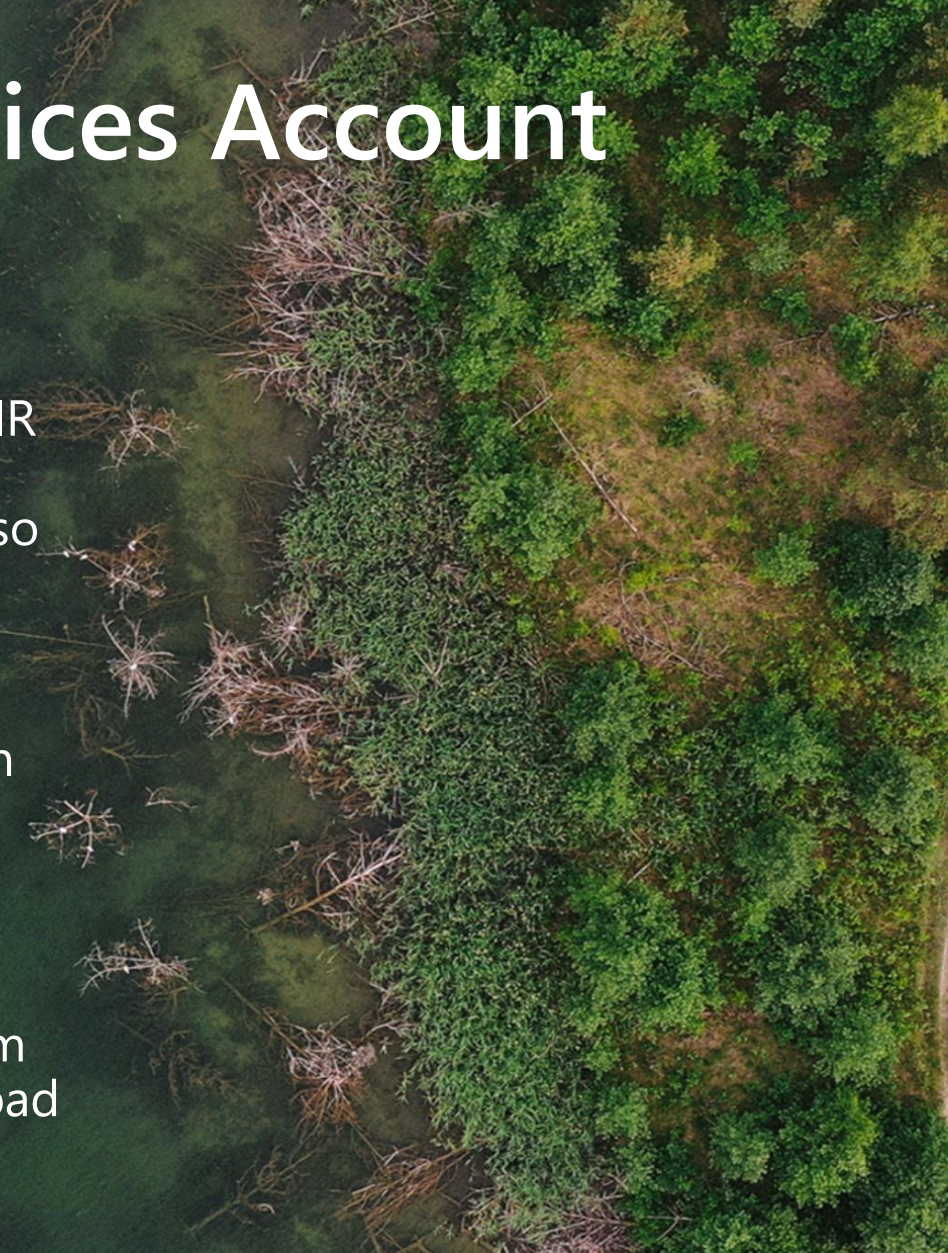


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Land, Ecosystem Extent & Services Account

- 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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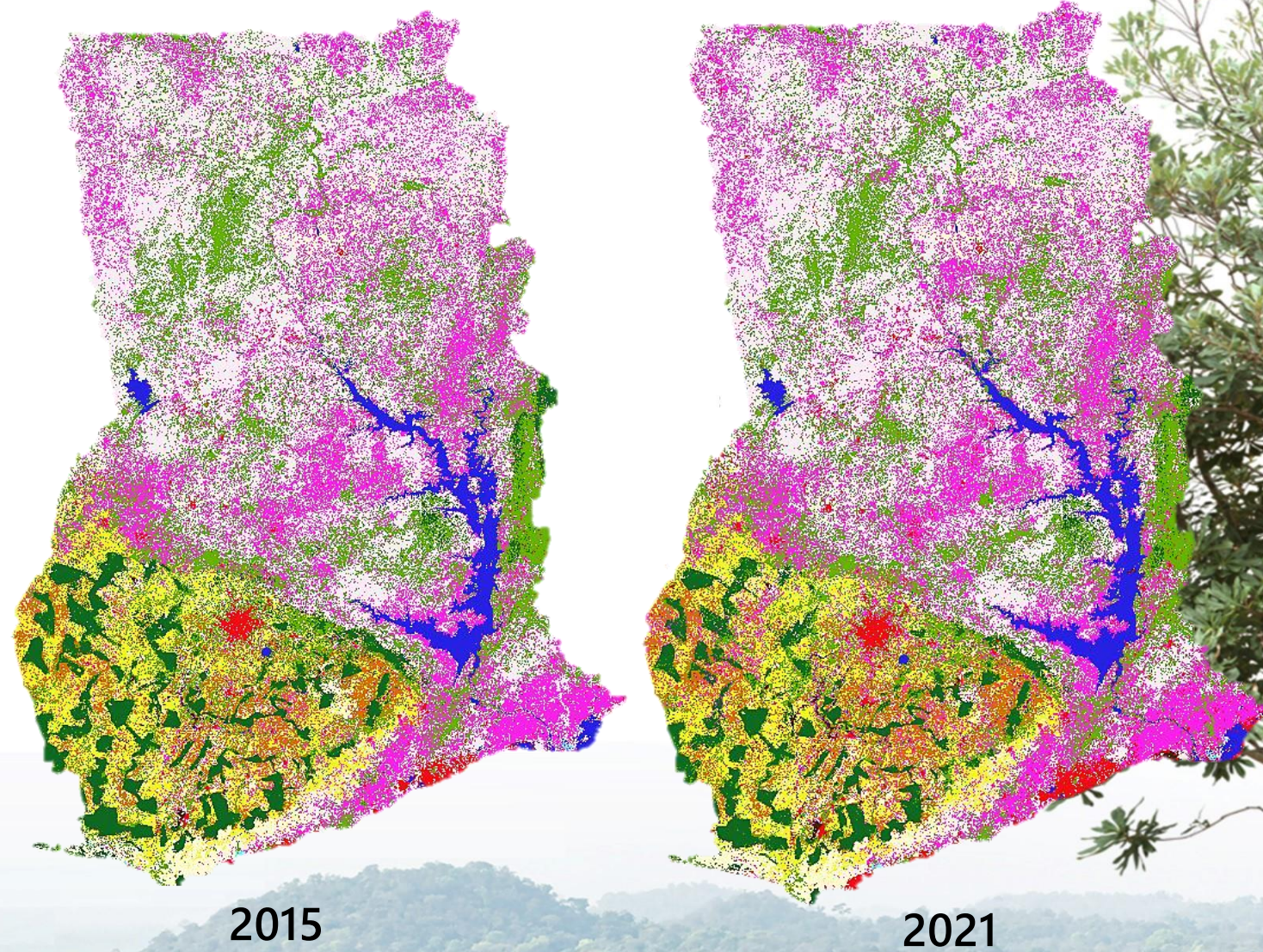
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Land Cover Maps

Legend

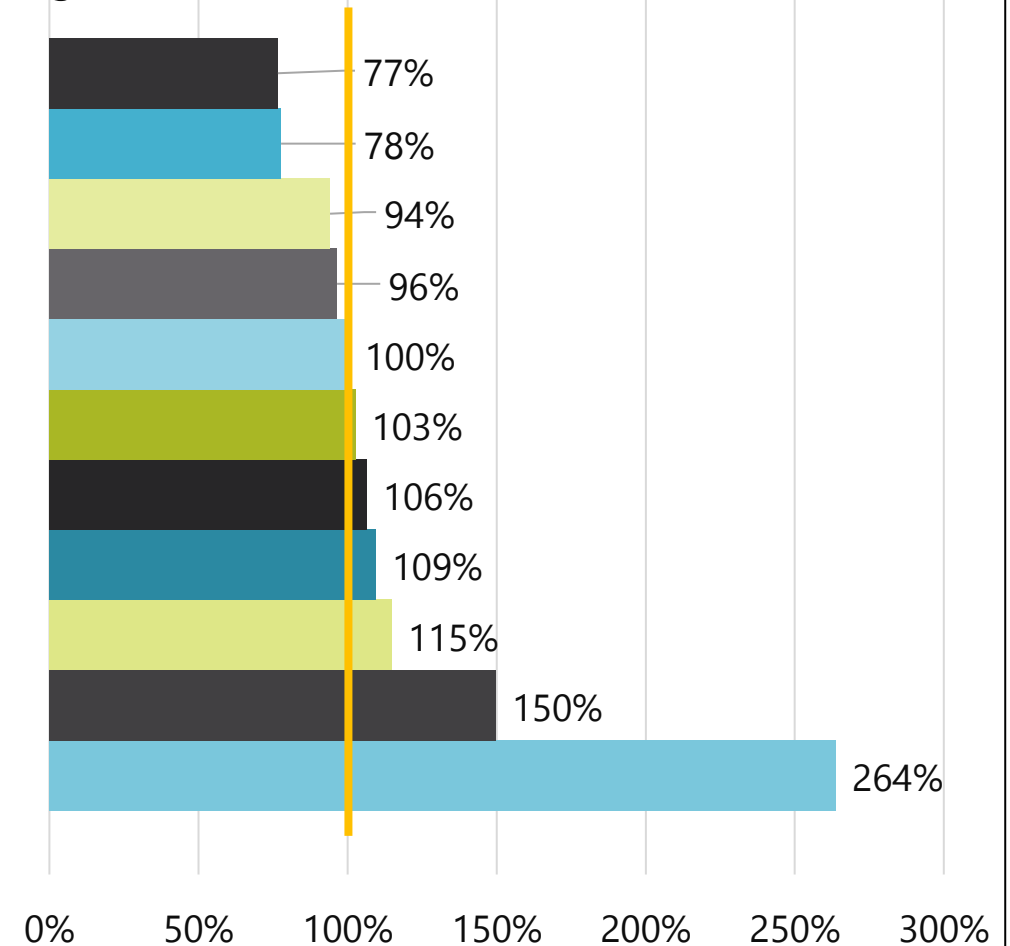
- Closed forest
- Open forest
- Water
- Grassland
- Settlement
- Mono cocoa
- Shaded cocoa
- Other tree crop
- Food crop
- Bare surface
- Mangroves



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.



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Ecosystems Extent Accounts (1990/2021)



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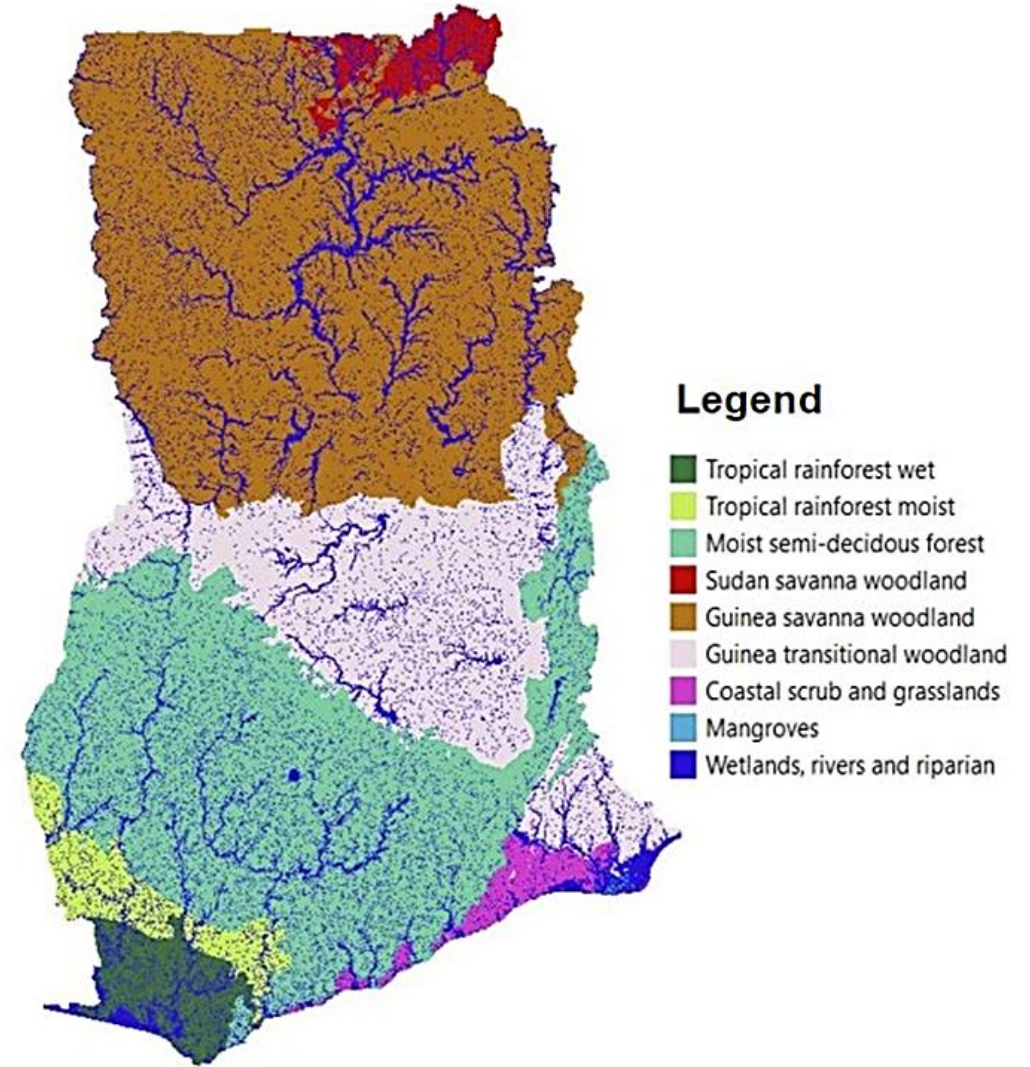
EEA Development: Baseline Ecosystem Extent Map

Change is tracked from a baseline onwards in successive accounting periods.

The baseline is stable – it changes only if there's improved accuracy, e.g., as a result of better data or additional ground-truthing efforts

Map from the CONNECT project was used as historic baseline -> which represents best estimate of natural occurrence of ecosystem types, prior to major human modification (say around 1750)

Links 1-1 (mostly) to IUCN Global Ecosystem Typology

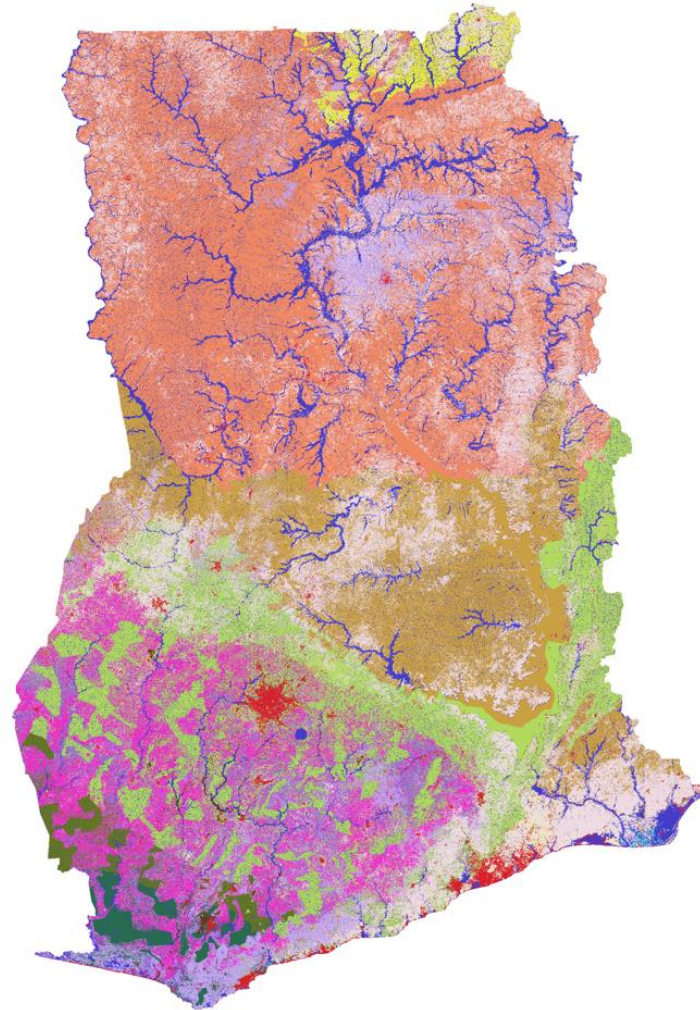


Ecosystem Extent 2015 and 2021

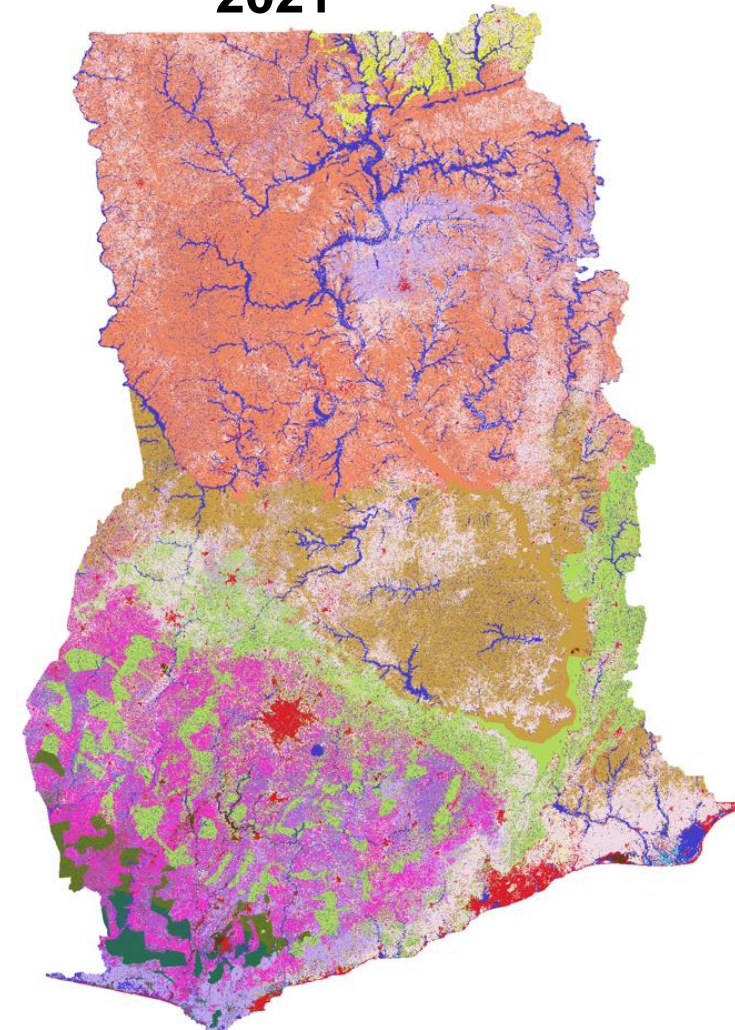
Legend

- 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
- Settlement
- Mono cocoa
- Shaded cocoa
- Other tree crop
- Food crop
- Bare surface

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.**



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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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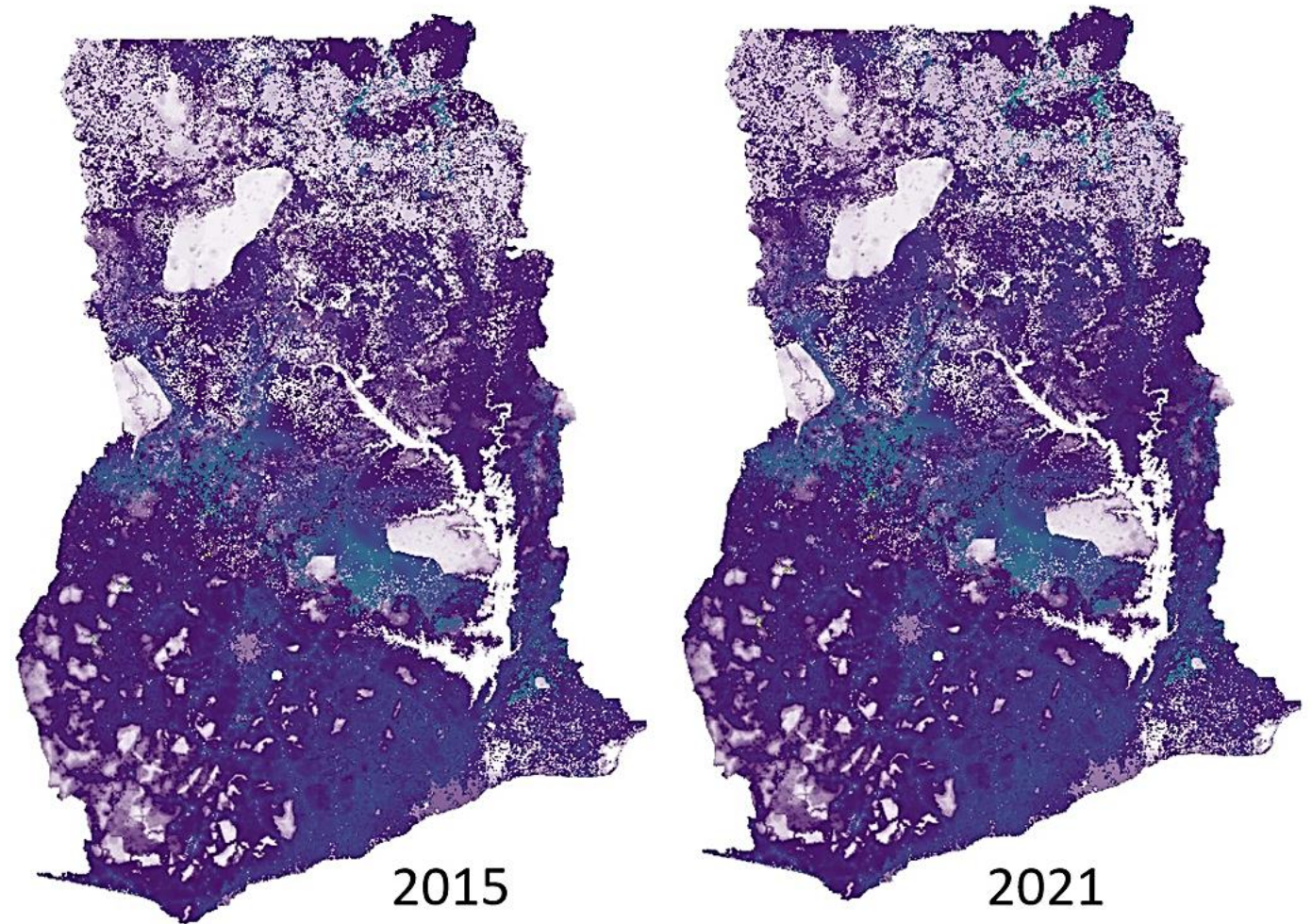


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PROVISIONING SERVICES - WOODFUELS (2015 - 2021)

- 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

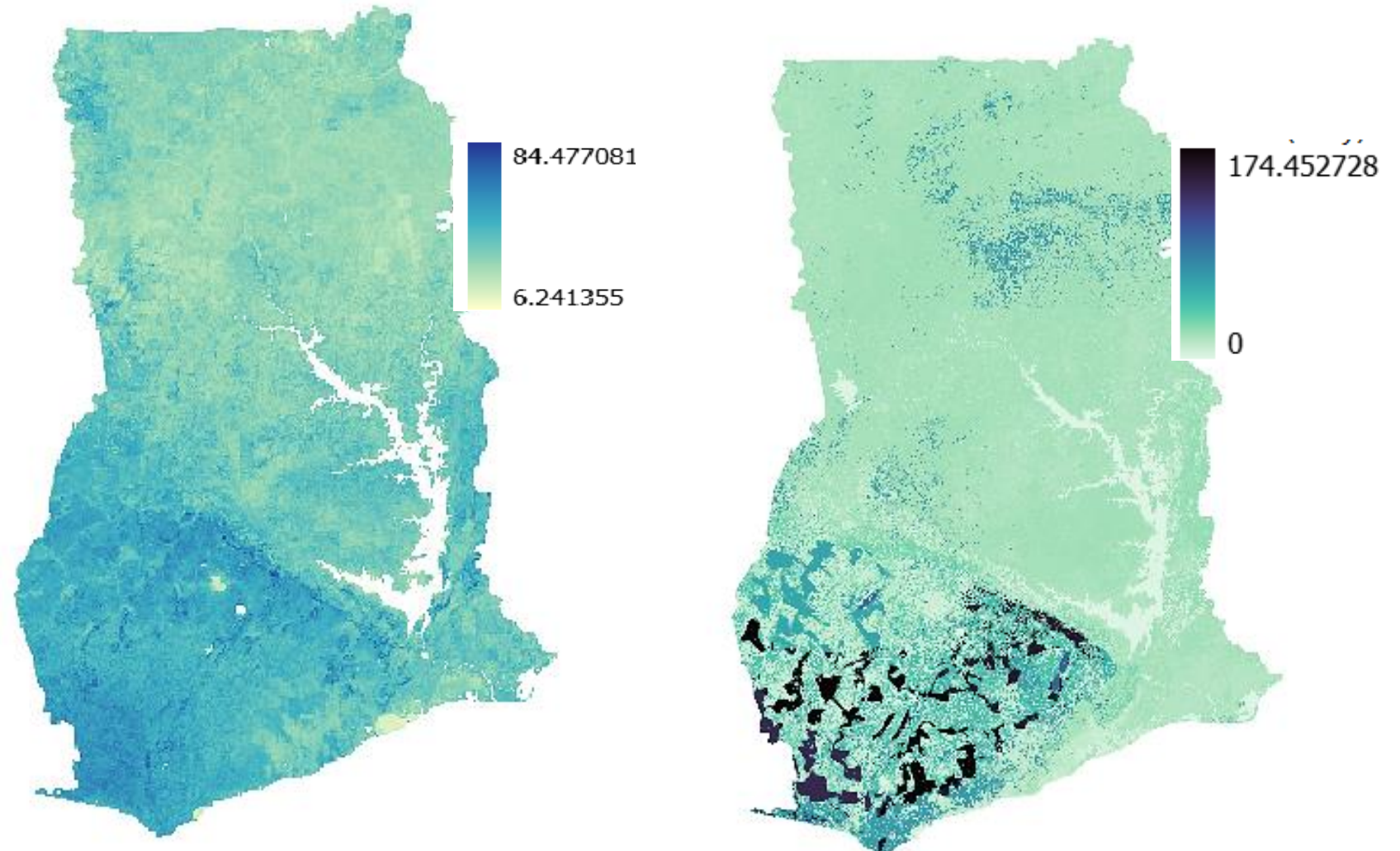


Figure: LEFT: Soil Organic Carbon (0-30 cm); RIGHT Vegetational carbon (tC/ha)

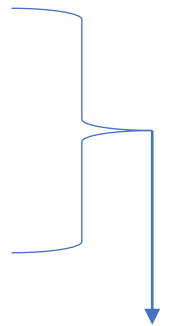
ECOSYSTEM SERVICES ACCOUNT (ESA) – ONGOING WORK

- 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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