UN Biodiversity Lab
(UNBL) Global Biodiversity
Framework (GBF)
Mapping Project

POLICY NOTE FOR DECISION MAKERS

Enabling Implementation of
NBSAP and KMGBF Targets
in Ghana

UNBiodiversity
Lab

UN Biodiversity Lab (UNBL) Global Biodiversity Framework (GBF) Mapping Project — Policy Note For Decision Makers:
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Project aim

Ghana's commitments to the implementation of its National Biodiversity Strategy and Action Plan (NBSAP) and the Kunming-Montreal Global Biodiversity Framework (KMGBF) under the Convention on Biological Diversity (CBD) necessitate monitoring, reporting, and evaluation activities that can directly contribute to the achievement of national biodiversity targets and the global KMGBF targets.

Spatial planning is essential for the achievement of a large proportion of NBSAP and KMGBF targets in Ghana. In particular, KMGBF Targets 1, 2, and 3 – which aim to spatially plan and manage all areas to reduce biodiversity loss; restore 30% of all degraded ecosystems; and conserve 30% of land, waters and seas – depend on the use of geospatial data for identifying areas for sustainable management, restoration and protection. Implementation of KMGBF Targets 4-12 and 14 can also be bolstered by spatial planning, according to a report released by the International Union for the Conservation of Nature (IUCN). In this context, the UNBL-GBF Mapping Project, led by the Ministry of Environment, Science and Technology (MEST), utilized the UN Biodiversity Lab (UNBL) spatial data platform and its Essential Life Support Area (ELSA) methodology to implement a gold-standard integrated spatial planning approach that employs core principles of systematic conservation planning (SCP) to deliver an ELSA priority action map as a key output for guiding nature-based policy action in Ghana. The project also provided foundational support around the use of spatial data for monitoring and development of the Seventh National Report (7NR) to the CBD.

Photo credit: Kofi Amponsah-Mensah, Centre for Biodiversity Conservation and Research (2025)

ELSA priority action map to implement the KMGBF

How was it developed?

The ELSA priority action map to support actions to achieve the spatial KMGBF targets was developed through five distinct project steps. These steps are designed around a holistic, context-specific, and adaptive approach to integrated spatial planning, centered on the whole-of-society and whole-of-government approaches.
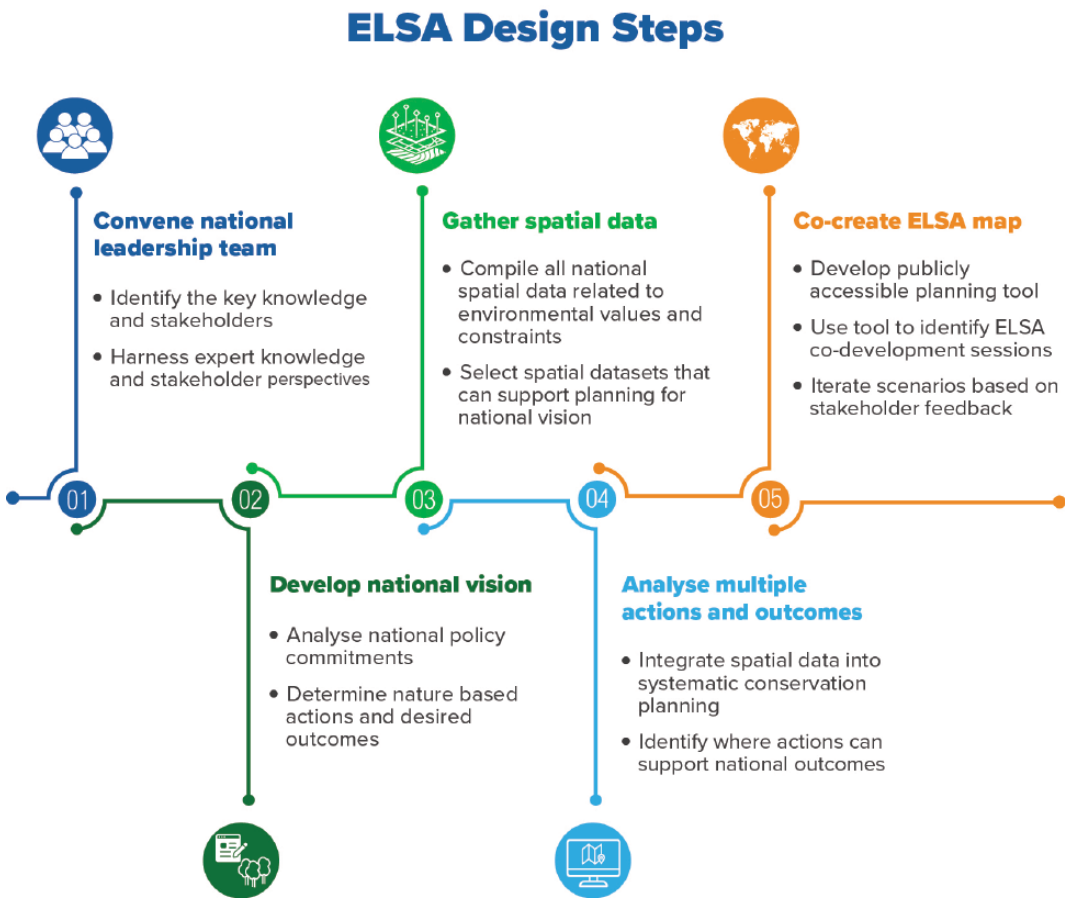

Figure 1. Five steps for creating an ELSA priority action map to support action towards KMGBF targets (Images adapted from Rice et al.[1])

Step 1 of the integrated spatial planning process involves **engaging experts with relevant knowledge and stakeholders with vested interest** or influence in the outcome. Engaging these groups to become leaders in the co-design and application of the spatial planning process is essential, because it ensures that the resulting spatial plan is **credible, trusted, and applicable in policy making**. In Ghana, MEST acted as the

1 Rice, W.S., Sowman, M.R., and Bavinck, M. (2020). Using Theory of Change to improve post-2020 conservation: A proposed framework and recommendations for use. Conserv Sci Pract 2, e301. https://doi.org/10.1111/csp2.301.

convening partner to identify members of the core working group undertaking the spatial prioritization mapping exercise, in close coordination with the UNDP Country Office. These included: the Land Use and Spatial Planning Authority (LUSPA), Conservation Alliance (CA), Environmental Protection Agency (EPA), Forestry Commission (FC), and Geological Survey Department and Centre for Remote Sensing and Geographic Information Services (CERSGIS), among others. Together with the UNBL team, the core working group met regularly to ensure the project's implementation.

Step 2 involves developing a **national vision** through a series of **stakeholder engagement sessions** that focus specifically on national policy commitments aligned with the KMGBF. In Ghana, these sessions emphasized national goals to develop an ELSA priority action map that identifies priority territories where the implementation of distinct nature-based actions can best contribute to the achievement of KMGBF Targets 1-4, 7, 8, and 10-12.

Step 3 involves **gathering spatial datasets** to support the qualitative elements of KMGBF Targets 1-4, 7, 8, and 10-12. These are the policy targets which could be spatially mapped with available national and global data. The final data stack used in the spatial prioritization analysis for the identification of priority action areas in the output map is a carefully collated mix of 7 national and 27 global datasets on biodiversity, climate change, and human well-being, which each map to a single KMGBF target. Many KMGBF targets are mapped by several datasets to increase representativity.
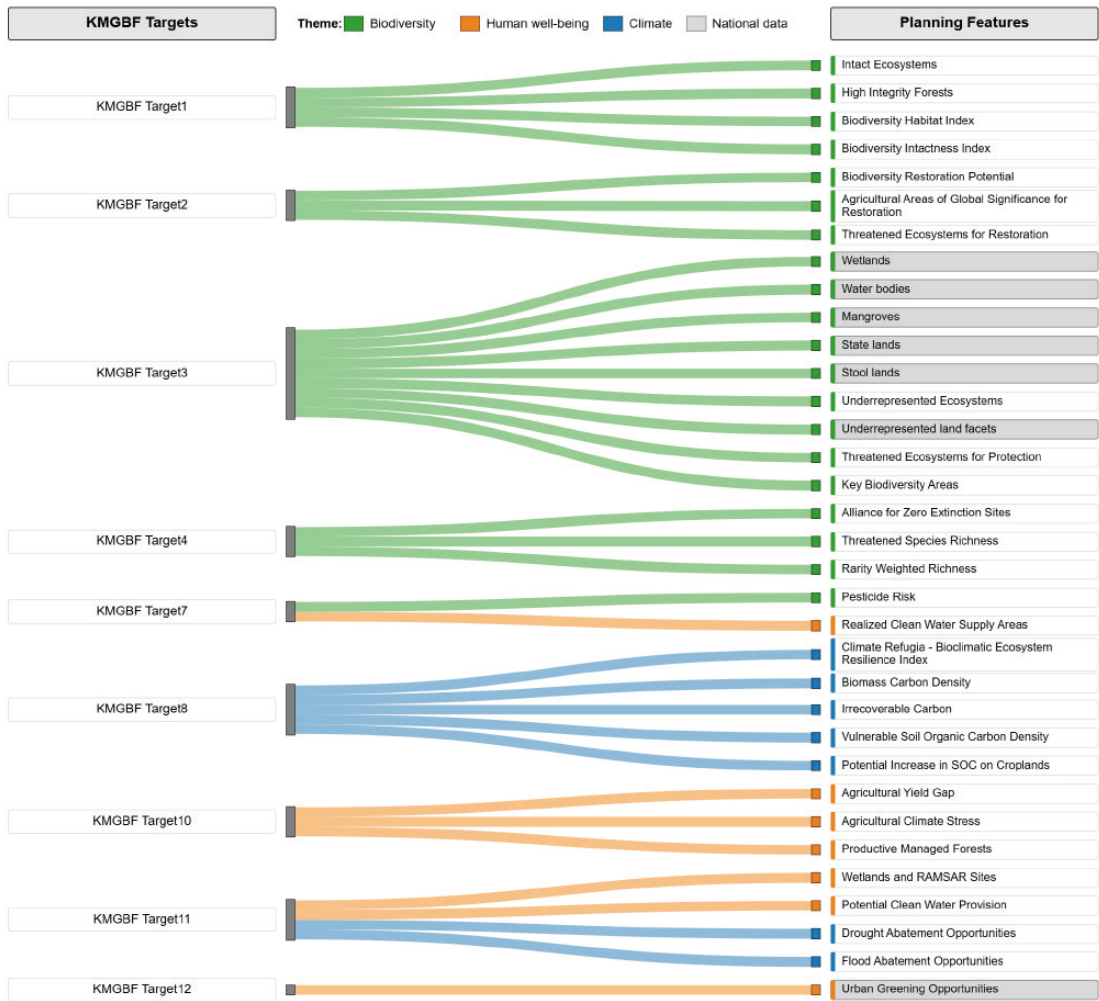

Figure 2. KMGBF targets and planning features selected for inclusion in the analysis to map priority action areas in Ghana

Step 4 uses principles of **Systematic Conservation Planning (SCP)** to analyze multiple actions and outcomes to generate an initial ELSA priority action map. SCP was used to run a **spatial prioritization analysis** to analyze all nature-based action zones and datasets at once, thus **capitalizing on spatial synergies** across all KMGBF targets when identifying priority areas for KMGBF implementation in Ghana.

Step 5, which is the final step, involves a **co-creation session with national stakeholders** in which the final ELSA priority action map is generated. Using Ghana's **ELSA Integrated Spatial Planning Tool configuration on UNBL**, a series of **iterative online workshops** were held in which national experts and stakeholders **weighed datasets** based on national priorities and **evaluated trade-offs** across different spatial prioritization scenarios. The final ELSA priority action map is a product that best meets the diverse objectives of national stakeholders in Ghana to meet the national vision developed in step two. Two different versions of this map were developed to reflect two scenarios of spatial prioritization:

1. An **unfiltered version** in which spatial cohesion and clustering of priority nature-based action areas is **kept to a minimum** within the analysis, resulting in a fine-grained distribution of action areas (Figure 3a); and

2. A **filtered version** in which spatial cohesion and clustering of priority nature-based action areas is **heightened to a factor of 500** to reflect a more realistic scenario of feasible on-the-ground management, resulting in a coarse-grained distribution of action areas (Figure 3b).

These maps were created through an extensive consultation process with national experts, yet they should not be viewed as static products that are inflexible to future updates. Since the methodology enables decision makers to undertake new iterations of the process through the ELSA Integrated Spatial Planning Tool, new alternate and updated scenarios going beyond those explored in this project could be developed. This may include updating datasets and running new scenarios using the ELSA Tool.
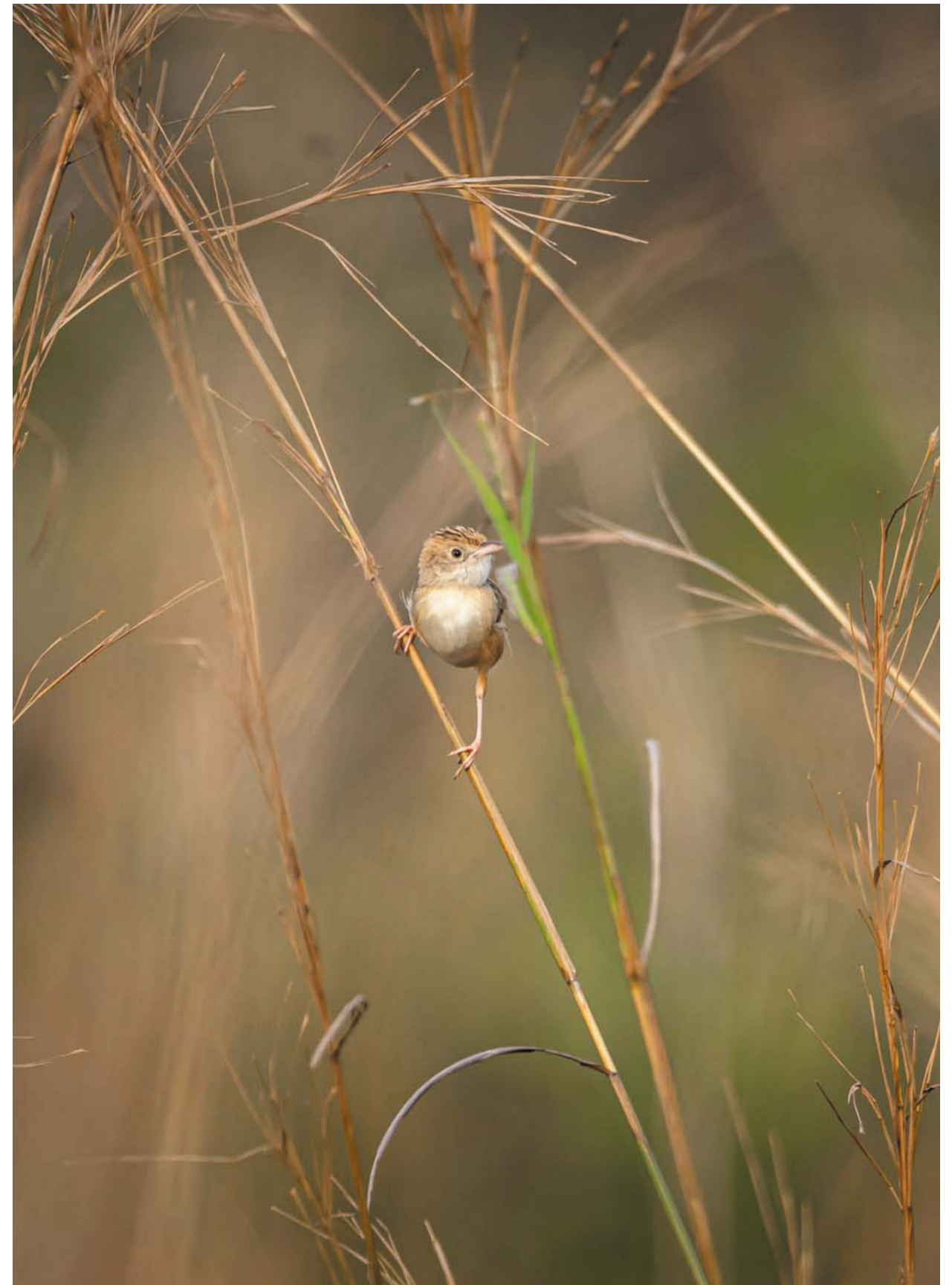

Photo credit: Kofi Amponsah-Mensah, Centre for Biodiversity Conservation and Research (2025)
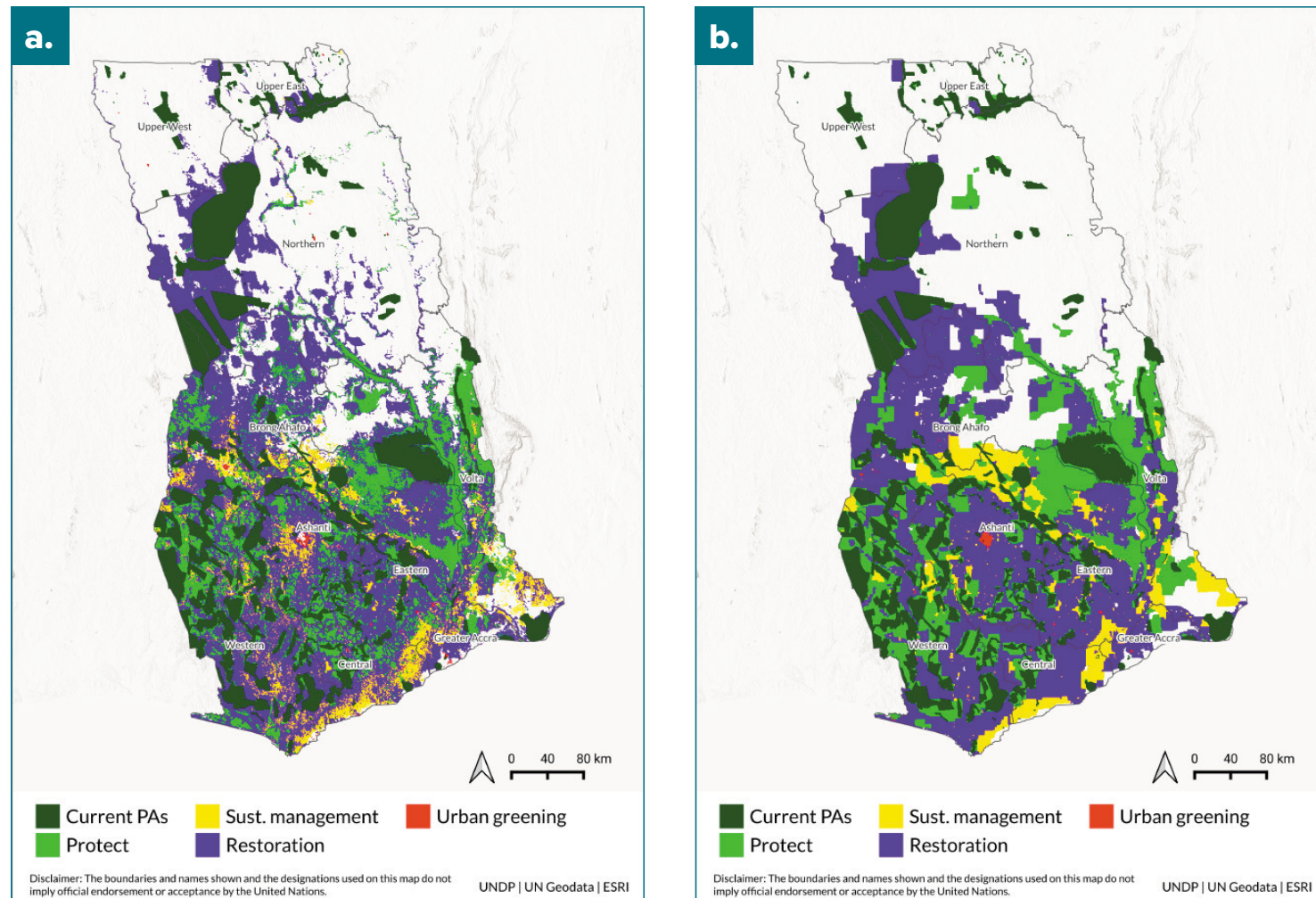
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Figure 3. Spatial prioritization maps identifying where achieving 30% protection, 29.1% restoration (30% of degraded areas), 5% management, and 0.12% urban greening (30% of urban extent) in Ghana will maximize the combined representation across all planning features. For map a) the boundary penalty factor (BPF) in the tool is set to 0, which is a level that results in an unfiltered distribution of priority action areas and therefore a fine-grained spatial prioritization solution. For map b) the BPF in the tool is set to 500, which is a level that promotes spatial cohesion and management feasibility without substantially reducing the coverage of planning features, therefore resulting in a coarse-grained spatial prioritization solution. These maps have been produced at a 550m resolution.

MAP APPLICATION: These nationally endorsed ELSA priority action maps to support KMGBF Targets 1, 2, 3, 4, 7, 8, 10, 11 and 12 show where actions can most effectively achieve the greatest impact across all planning features while minimizing unacceptable tradeoffs of integrated spatial planning. It can also support the implementation of the Land Degradation Neutrality (LDN) response hierarchy under the UN Convention to Combat Desertification (UNCCD). The LDN response hierarchy is a structured approach to achieve neutrality by prioritizing prevention, minimizing ongoing degradation, and restoring degraded land. The spatial prioritization maps outline an ambitious expansion of protected areas, from 15.9% of the land area covered by existing protected areas, to 30%. This enhancement in protection could come from new protected areas or recognition of other effective area-based conservation measures (OECMs). The maps also outline critical areas to pursue sustainable management practices (5% of land area), ecosystem restoration (29.1% of land area), and urban greening (0.12% of land area) to achieve multiple environmental, climate, and sustainable development outcomes. They show a strategic, national-level perspective on important places to take action to protect, manage, restore or urban green. Before implementing actions, however, further ground truthing and engagement with local rights holders and relevant stakeholders is needed.

MAP ACCESS: The image files for the heatmaps can be accessed here. The underlying GIS files for all heatmaps created using the ELSA Integrated Spatial Planning Tool can be accessed here. These maps should be cited as:

MEST & UN Biodiversity Lab 2025. Technical Report for the UNBL-GBF Mapping Project in Ghana. ELSA priority action map created using spatial data and the UNBL Essential Life Support Area Integrated Spatial Planning Tool on 13 August 2025.

MAP UPDATES: This map can be further updated, and complemented with additional optimization runs for different scenarios, through use of the ELSA Integrated Spatial Planning Tool configuration for Ghana. Please see the further resources section for detailed guidance on accessing and using the tool.

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What does the ELSA priority action map show?

The ELSA priority action map for Ghana shows priority areas for nature-based actions that could contribute to the achievement of national policy commitments under the KMGBF. This map is intended to support MEST to identify where concrete action could be taken. The different zones correspond to specific types of nature-based actions, and their spatial distribution within the map identifies a solution in which the combined representation across all input datasets used to map the spatial KMGBF targets will be maximized, leading to optimal outcomes across all spatial targets.

ELSA zone	Definition	National coverage
Protection	Under KMGBF Target 3, Parties undertake to conserve 30% of land, waters, and seas by 2030. The ELSA priority action map identifies areas where expansion of protected areas and/or OECMs could most effectively contribute to KMGBF Target 3.	30% of Ghana's land area is allocated towards the protection action, in line with KMGBF Target 3.
Restoration	Under KMGBF Target 2, Parties undertake to restore 30% of all degraded ecosystems. The ELSA priority action map identifies areas where restoration actions could alleviate degradation processes and thereby most effectively contribute to KMGBF Target 2.	29.1% of Ghana's land area is allocated towards the restoration action. This proportion represents 30% of the national area covered by degraded lands in Ghana, in line with KMGBF Target 2.
Sustainable management	Under KMGBF Target 10, Parties undertake to enhance biodiversity and sustainability in agriculture, aquaculture, fisheries, and forestry. The ELSA priority action map identifies areas where sustainable management actions could most effectively contribute to KMGBF Target 10.	5% of Ghana's land area is allocated towards the sustainable management action. This is in line with expert opinions received from the core project team and review by national implementing partners and stakeholders.
Urban greening	Under KMGBF Target 12, Parties undertake to enhance green spaces and urban planning for human well-being and biodiversity. This ELSA priority action map identifies areas where urban greening actions in urban areas could most effectively contribute to KMGBF Target 12.	0.12% of Ghana's land area is allocated towards the urban greening action. This proportion represents 30% of the total urban extent in Ghana. This is in line with expert opinions from the core project team, alignment with KMGBF Targets 2 and 3, as well as final review by national implementing partners and stakeholders.
Existing Protected Areas	Existing Protected Areas, unlike all other categories, are not intended to recommend any nature-based action. However, they are "locked in" to the priority area for protection and thereby make up an existing proportion of the 30% of land area allocated to the protection action. Overlaying existing Protected Areas over the ELSA priority action map allows for a differentiation between priority areas for protection that are already recognized as officially protected areas, and priority areas for protection that are not yet recognized as officially protected areas.	15.9% of Ghana's land area is currently covered by existing Protected Areas. Since 30% of the total land area is allocated towards the protection action in the ELSA priority action map, this means that 14.1% of the land area represents priority areas for protection that are not recognized as officially protected areas in Ghana.

How can the ELSA priority action map be evaluated by individual stakeholders based on national priorities?

The project additionally delivered a set of derivative products that are designed to be used hand-in-hand with the original ELSA priority action map to assist stakeholders in Ghana to evaluate the coverage of priority action zones in the final spatial prioritization scenarios for particular regions.

These come in the form of heatmaps disaggregated by each nature-based action. These heatmaps identify important locations for achieving KMGBF Targets 1, 2, 3, 4, 7, 8, 10, 11 and 12. They are the normalized sum of each individual dataset's value in each map cell, multiplied by the weights given to each dataset. Important areas (where more datasets used in the spatial prioritization analysis occur, adjusted for weighting) are shown in a range of colors from green to yellow, with those in bright yellow being the most important. Heatmaps can be used to identify areas where the overall contribution of spatial datasets – each one representing a distinct policy target – to KMGBF Targets 1, 2, 3, 4, 7, 8, 10, 11 and 12 is greatest.

By evaluating heatmaps, national experts can view the aggregated stakeholder-weighted dataset's data to determine if the patterns for each nature-based action match their expectations and personal knowledge of the region. If a particular region which national stakeholders believe is particularly important for the implementation of protected areas is showing up as 'cold' within the heatmap relating to the protect action, then stakeholders could utilize the ELSA Integrated Spatial Planning Tool to increase the weight of planning features affected by the protect action that are present in this region to reflect a 'warmer' presence in the heatmap, and therefore increase the likelihood of this region being allocated the 'Protect' action in future spatial prioritization scenarios yielding ELSA priority action maps.
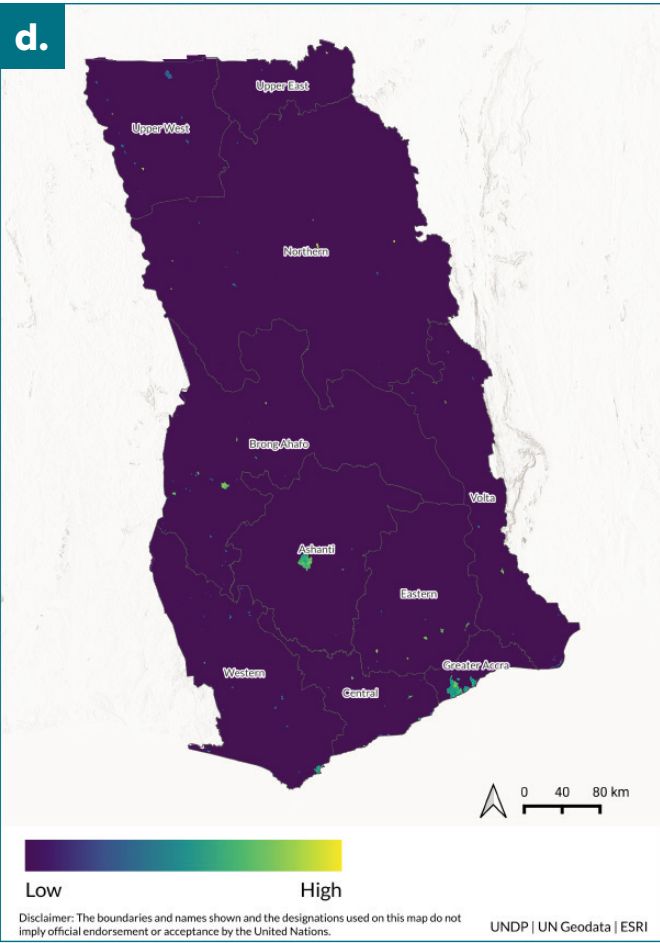
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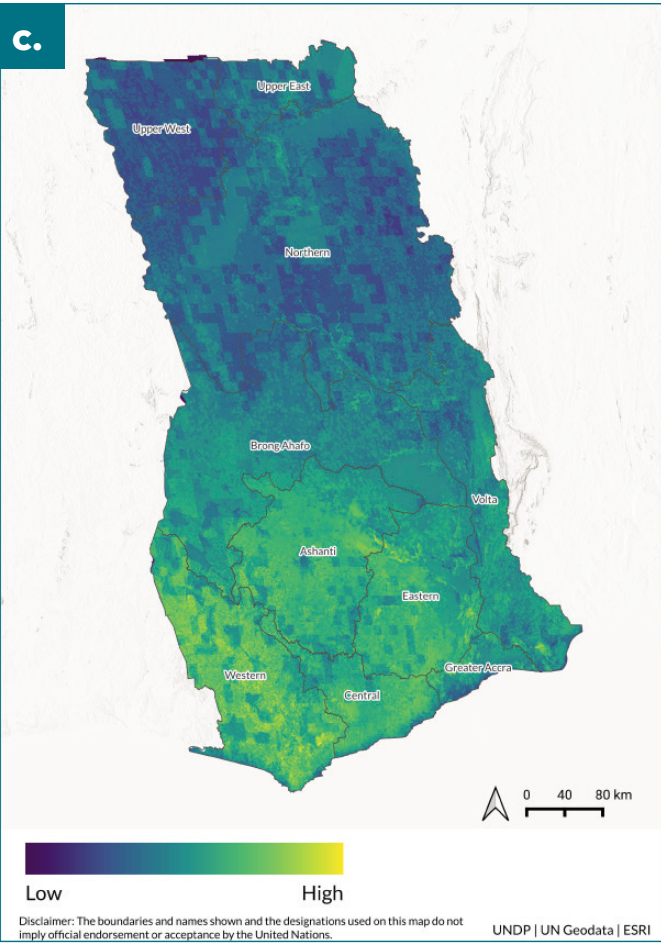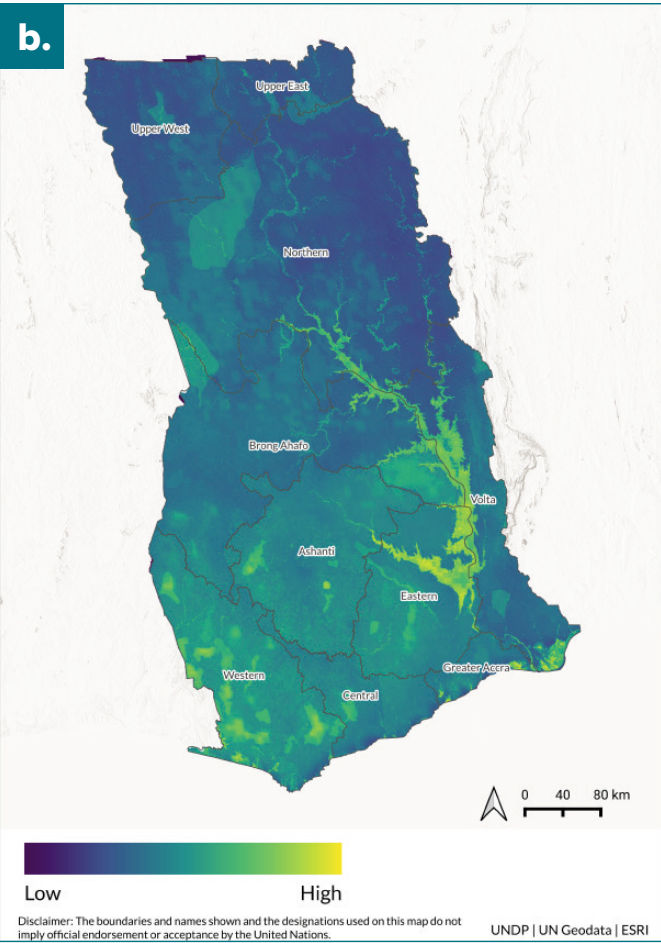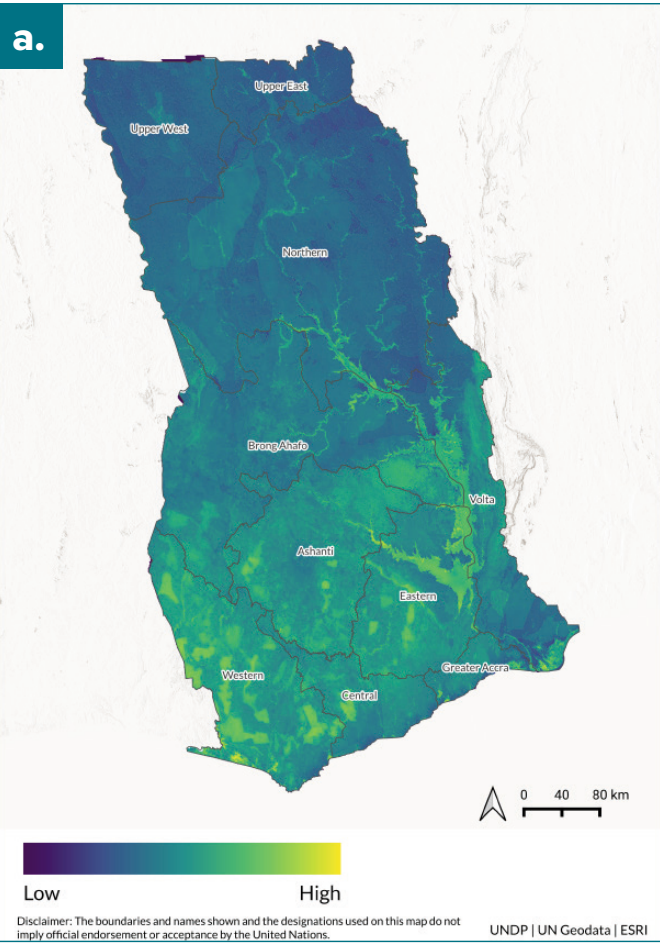Enabling Implementation of NBSAP and KMGBF Targets in Ghana

Figure 5. Heatmaps for a) protection, b) restoration, c) sustainable management and d) urban greening, depicting cold areas (dark purple) where the lowest number of planning features affected by the respective action overlap, and hot areas (yellow) where the largest number of planning features affected by the respective action overlap.

MAP APPLICATION: National stakeholders in Ghana could use these heatmaps to compare the extent to which areas identified as important for achieving KMGBF targets related to each nature-based action reflect their understanding of particular regions and therefore use these heatmaps as tools to evaluate the accuracy of the ELSA priority action map (Figure 3) and iterate additional, well-informed spatial prioritization scenarios using the ELSA Integrated Spatial Planning Tool.

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How can the ELSA priority action map and ELSA heat maps be used?

The ELSA priority action and heat maps can be used for strategic planning and supporting Ghana to achieve KMGBF commitments at a national level. They can also be used as a resource to support Ghana's finalization of the 7th National Report (7NR) to the Convention on Biological Diversity (CBD). Specifically:

- The ELSA priority action map directly supports achievement of KMGBF Targets 2, 3, 10, and 12, and additionally contributes to qualitative elements of Targets 1, 4, 7, 8 and 11.

- The nature-based actions in the map align functionally with actions of the Land Degradation Neutrality (LDN) response hierarchy supported under the UN Convention to Combat Desertification (UNCCD) – 'Protect-Manage-Restore' from the KMGBF is equivalent to 'Avoid-Reduce-Reverse' from the LDN response hierachy.

Importantly, before implementing any specific actions prescribed in the ELSA priority action map, and any derivative products of the ELSA priority action map, further ground truthing and engagement with local rights holders and relevant stakeholders is needed.

Other key outcomes of the project

Alongside the co-creation of the ELSA priority action map, national stakeholders in Ghana also took part in various ad-hoc monitoring activities designed to enhance the use of the UNBL platform for monitoring and reporting on NBSAP and KMGBF targets in their country. These activities included: (1) creating a central repository for national data in Ghana's UNBL workspace; (2) executing capacity building and training on UNBL to enable national stakeholders to utilize features most relevant to action around the KMGBF; and (3) executing a training on geospatial data that can support production of the 7NR.

The ELSA priority action map, in combination with the ad-hoc monitoring activities, led to a robust set of recommendations to achieve KMGBF Targets 1-4, 7-8, and 10-12, and to support relevant policy development, implementation, monitoring, and reporting, with a specific focus on Ghana's NBSAP update and implementation. The capacity building offerings developed in partnership with MEST and provided to technical experts were designed to support handover of the Ghana workspace on UNBL and the ELSA spatial prioritization data, tool, and outputs to facilitate ownership and use throughout the implementation period of the NBSAP and the KMGBF.

Photo credit: Kofi Amponsah-Mensah, Centre for Biodiversity Conservation and Research (2025)

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Next steps

MEST is equipped to continue using the ELSA Integrated Spatial Planning Tool configuration for Ghana on UNBL and further train national stakeholders to undertake new iterations of the spatial prioritization analysis to create new ELSA priority action maps. MEST is also able to utilize its UNBL workspace as well as other UNBL functionalities to support monitoring and reporting on the NBSAP and KMGBF.

MEST plans to use the results of the UNBL-GBF Mapping Project maps in the new NBSAP that is being updated and will be officially launched in September 2026 – following a specific timeline that ensures a whole-of-society and whole-of-government approach in the country. The UNBL-GBF Mapping Project results will contribute to national goals related to Target 1, Target 2 and Target 3 of the KMGBF, among others.

The national stakeholders have stated that the UNBL is a very useful tool to consolidate national spatial data required for the 7NR, subsequent reporting, and similar national assignments. Discussions have been had around plans and strategies required to collect data on a national scale and may be the subject of subsequent support. Also, support to further train and equip additional staff on the use of the UNBL, particularly with respect to uploading and managing data on the Ghana workspace of the UNBL will be a priority.

Further information

- **Technical Report:** This document provides a detailed technical description of methods and data used to generate spatial prioritization map, as well as the results of this work.

- **UNBL Workspace for Ghana:** Please contact Emelyne Wright Hanson (emelyne.whanson@mesti.gov.gh) and Yaw Osei-Owusu (yosei-owusu@conservealliance.org), with a copy to support@unbiodiversitylab.org to request access. As a member of Ghana's workspace on UNBL, you will be able to access national and global data relevant to NBSAP and KMGBF implementation, view the ELSA priority action map, and use the ELSA Integrated Spatial Planning Tool for Ghana to iterate and update the ELSA priority action map.

- **User Guide: ELSA Integrated Spatial Planning Tool:** Technical guide to support national stakeholders to generate new iterations of the ELSA priority action map.

- **User guides: UNBL Public Platform & UNBL Workspaces:** Technical guide to support national stakeholders to use the various features of UNBL and Ghana's workspace on UNBL.

Photo credit: Kofi Amponsah-Mensah, Centre for Biodiversity Conservation and Research (2025)

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