Using Biodiversity Information Products to Inform the Mitigation Hierarchy

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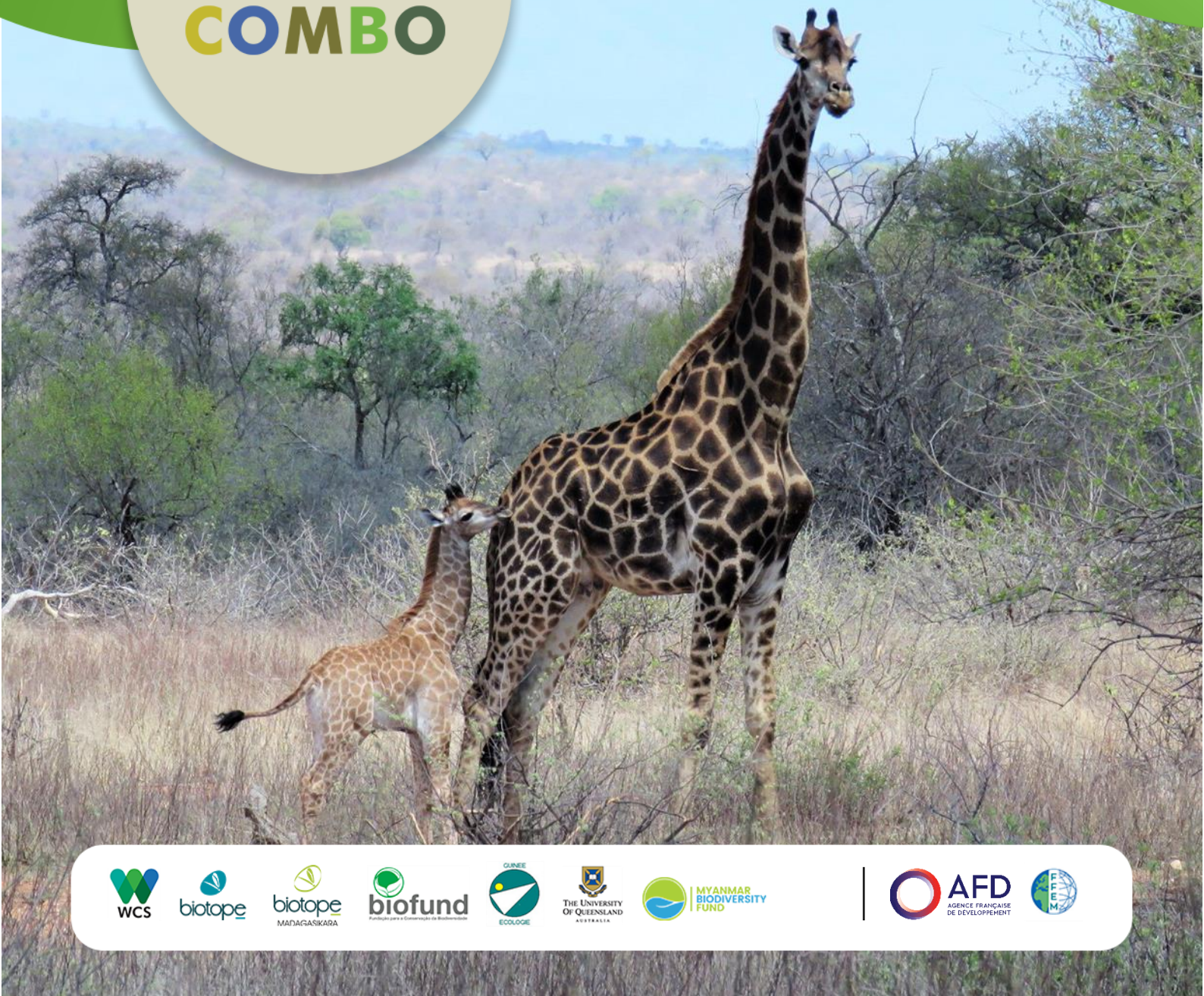

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1. OVERVIEW

Uganda has a rich biodiversity and is ranked among the top ten most biodiverse countries in the world. It is host to 53.9% of the world's population of mountain gorillas, 11% (1,063 species) of the world's recorded species of birds (50% of African bird species), 7.8% (345 species) of global mammal diversity (39% of Africa's mammal species richness), 19% (86 species) of Africa's amphibian species richness and 14% (142 species) of African reptile species richness, 1,249 recorded species of butterflies and 600 species of fish (NBSAPII, 2016).

The actual contribution of Uganda's biodiversity to the national economy has not been updated since the early 1990s. However, the NBSAPII included past estimates putting the gross economic output attributable to biological resource use in the fisheries, forestry, tourism, agriculture and energy sectors at US$ 546.6 million per year and indirect value associated with ecosystem services and functions at over US$ 200 million annually. The tourism industry alone which is a result of Uganda's natural capital is the highest foreign exchange earner contributing over US$ 1.6 billion to Uganda's GDP (i.e., 7.3%) and employing over 6% of Uganda's labor force (2017/18).

However, despite these resources fetching such foreign exchange, contributing to employment and sustaining livelihoods and national Gross Domestic Product (GDP), the importance of biodiversity and related natural capital is often poorly considered in economic planning and overall decision-making. This has ultimately led to the continued loss of species and ecosystems that have been the fabric of socio-economic development.

The Mitigation Hierarchy

One of the major used to balance development impacts with biodiversity conservation in Uganda is a decision-making framework known as the mitigation hierarchy (BBOP, 2012). This approach is designed to address impacts on biodiversity through first seeking to avoid impacts to the greatest extent possible, then minimizing impacts and restoring damaged biodiversity, and finally - as a last resort - by offsetting any residual impacts. The overall aim of implementing these steps is to achieve no net loss or a net gain of biodiversity (BBOP, 2012; Ekstrom et al., 2015). Because biodiversity is inherently spatially variable, information and maps of the distribution and status of biodiversity in a given region are essential for robust application of the mitigation hierarchy. Biodiversity information is crucial for both formulating effective mitigation policies and for direct application of the mitigation hierarchy in a specific development project. Thus, the information from biodiversity mapping can be used, for example, to identify priority areas for biodiversity conservation and impact avoidance, inform the development of systems to quantify impacts on biodiversity and assess suitable offset / compensation requirements, decide on exchange rules and identify appropriate mitigation measures & locations.

Box 1 – What is the mitigation hierarchy?

One of the major strategies by which countries and other jurisdictions attempt to balance development impacts with biodiversity conservation is a decision-making framework known as the mitigation hierarchy (BBOP, 2012; CSBI, 2015). This approach is designed to address negative impacts on biodiversity through first seeking to avoid impacts to the greatest extent possible, then minimising impacts and restoring biodiversity damaged by project activities, and finally - as a last resort - by offsetting any residual impacts. The overall aim of implementing these steps is to achieve No Net Loss or a Net Gain of biodiversity (BBOP, 2012; CSBI, 2015).

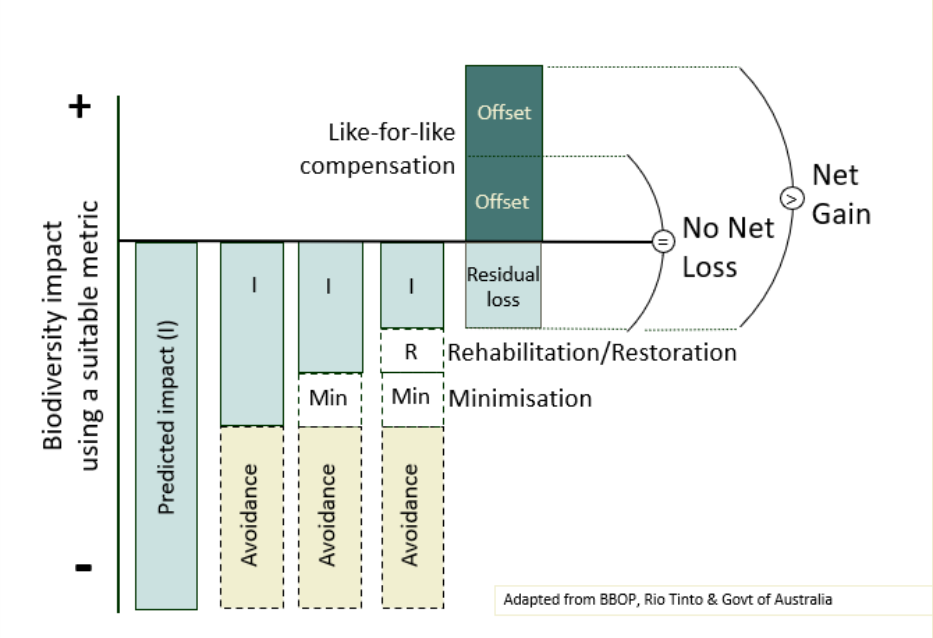

Figure 1. Suitable quantitative biodiversity metrics should be used for the different steps of the mitigation hierarchy (quantifying residual losses during avoidance, minimisation, restoration/ rehabilitation steps, and quantifying gains during offsets process).

2. BIODIVERSITY INFORMATION PRODUCTS

Biodiversity Information Products (BIPs) in essence refer to any sources of information or data that can be used by stakeholders to inform their decisions on aspects pertaining directly or indirectly to biodiversity. In Uganda, a great deal of biodiversity-related data is collected and collated in by state and non-state actors ranging from central (Ministries, Departments and Agencies) and local governments (sub-national authorities); academic and research institutions; community-based organisations; non-governmental organisations; cultural institutions; international development agencies; among others. and collaboratively with international organisations. Diverse types of information are generated from these data and serve varying purposes.

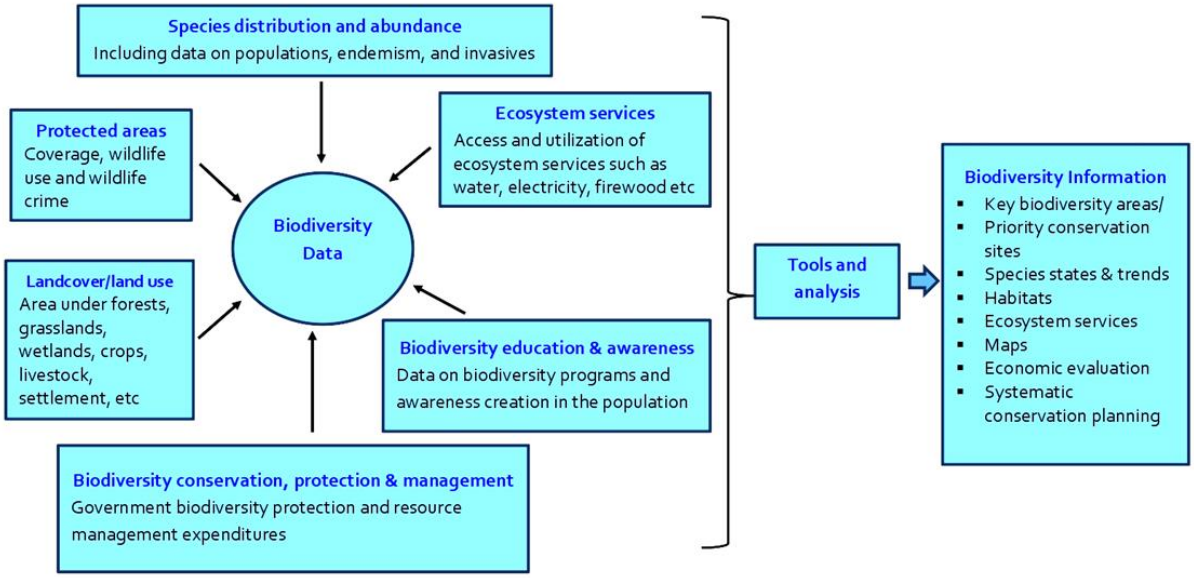

Figure 1: Biodiversity data and information generated in Uganda (adopted from CONNECT Project, 2021)

The data and information generated include those on species; protected areas; land cover and land use; ecosystem services; biodiversity conservation, protection and management; and biodiversity information and awareness.

Biodiversity Information Products to inform the Mitigation Hierarchy

While there is a great deal of biodiversity information available for Uganda, there are a small number of BIPS of particular relevance when developing mitigation hierarchy policies or applying the mitigation hierarchy for a development project – Ecosystem Maps, Red List of Ecosystems Assessments, Land-Use/Land Cover data, Key Biodiversity Areas, and Protected Areas. Table 1 provides a brief overview of these datasets and their use in planning for mitigation policy and application of the mitigation hierarchy.

In general, these BIPs provide important information on the distribution of natural ecosystems and their threat status (how endangered they are), which is vital for application of the mitigation hierarchy, as ecosystems are generally used as the unit of calculation for biodiversity impacts and offset requirements. Having information on the threat status of ecosystems is vital to ensure that developments avoid and minimise impacts on threatened biodiversity, which can be achieved through mitigation policy that incentivises developers to avoid impacting threatened ecosystems and species. Land use and land cover data is essential for understating the location of natural and human land uses, which can allow developers to design projects that avoid impacting natural areas as much as possible. Protected areas and KBAs provide crucial information on high-importance conservation areas that should be priorities for impact avoidance and can also be selected as offset receiving areas. Each dataset and its utility is explained in detail in section 3.

Table 1. Key Biodiversity Information Products available for informing the mitigation hierarchy in Uganda

BIP Dataset	*Description*	*Use for Designing Mitigation Policy*	*Use in Applying the Mitigation Hierarchy*
Langdale-Brown Ecosystem Map	Maps the original distribution of terrestrial ecosystems across Uganda. Original data has been cross-walked to align with the classes included in NFA Land Cover data.	• Combined with land cover data, can be used to assess ecosystem loss and degradation • Understanding where natural ecosystems remain can be used to identify high-priority areas for development avoidance • Also used to identify priority restoration areas where natural ecosystems have been lots	• Allows developers to understand which ecosystems are/were present in their project area • Avoidance planning: developers can understand where natural areas remain, and impacts should be avoided • Offset planning: identifying nearby areas of impacted ecosystems that can be considered for offsets
Red List of Ecosystems Assessment	Maps the threat status of terrestrial ecosystems in Uganda, assessed using the IUCN Red List of Ecosystems standard	• Used to set rules around where development is permitted (e.g. avoid development in Endangered ecosystems) • Used to scale offset requirements based on the threat status of impacted ecosystems (e.g. higher offsets required in more threatened ecosystems)	• Avoidance planning: developers can select project areas with minimal impacts on threatened ecosystems
Land Use/Land Cover	Maps the spatial distribution of land use types and their dynamics over time. Maps provide detailed data and information on water bodies (lakes & rivers), wetlands, agricultural areas, built up areas), forest types, rangelands and other land types.	• LULC data is used to track changes in ecosystem extent over time, which feeds into Red List of Ecosystems Assessments • Can be used to identify priority areas for afforestation or agroforestry based on identifying areas where recent loss of natural ecosystems has occurred	• Avoidance planning: Used to identify areas of natural ecosystems to be avoided, or impacts minimised. Placing infrastructure in already converted/degraded areas can reduce biodiversity impacts and offset requirements • Offset planning: Assessing LULC trends over time can identify both

			natural areas (suitable for protection) and areas of habitat conversion (suitable for restoration)
Protected Areas	Maps the location and type of Protected Areas across Uganda.	• Protected Areas should be high priority sites for avoidance of impacts in mitigation policy • Protected Areas can act as good-condition benchmarks or references against which to measure the progress of restoration & rehabilitation of ecosystems	• Avoidance planning: developers should endeavour to avoid all impacts within protected areas, and should revise project plans to achieve this. • Offset planning: developers may prioritise their offset efforts to deliver enhanced biodiversity benefits, e.g. through restoration of PA buffer zones, enhancing PA connectivity
Key Biodiversity Areas	Maps the location and type of Key Biodiversity Areas across Uganda.	• KBAs should be high priority sites for avoidance of impacts in mitigation policy • KBAs can act as good-condition benchmarks or references against which to measure the progress of restoration & rehabilitation of ecosystems	• Avoidance planning: developers should endeavour to avoid or minimise impacts within KBAs, and should revise project plans to achieve this. • Offset planning: developers may prioritise their offset efforts toward KBAs, e.g. through restoration of degraded areas within KBAs

3. KEY BIPS FOR UGANDA

Langdale-Brown Ecosystem Map

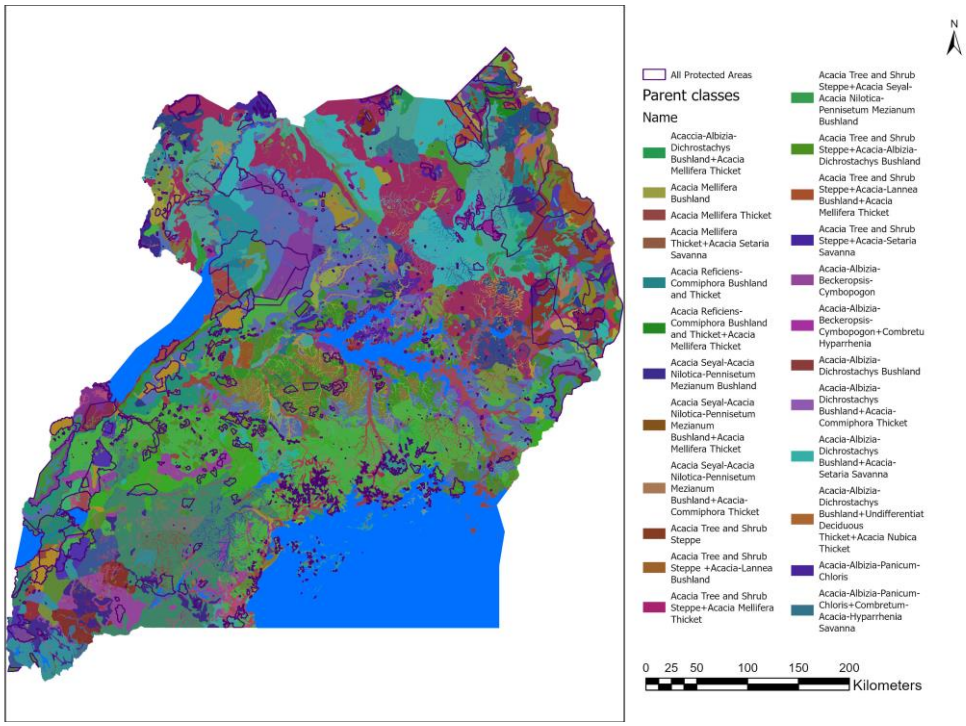

Figure 2: Langdale-Brown et al, 1964 ecosystem map

Description

Uganda has been inhabited by people for a very long time. As such, one could argue that no ecosystem in the country is completely 'natural', in the sense that it has not been impacted by humans and their activities. However, the extent of the impacts varies significantly and some may also be attributed to non-human activities. Understanding the distribution and abundance patterns for organisms is central in conservation. Regarding classification of Uganda's ecosystems using vegetation, the 1964 Langdale-Brown et al. and the National Biomass surveys are most the popular references.

Langdale-Brown et al. 1964 mapped Uganda's entire vegetation at a scale of 1:500,000 with both aerial photography and considerable groundwork. Following this work, Uganda's vegetation was categorised into 22 major plant communities denoted by letters between A and Z and subcategories (mapping units) denoted as A1, A2, etc (Figure1, Table 2). A total of 86 subcategories were identified. Each of the 86 subcategories was named based on the dominant (defining) species. These plant communities can be considered as being more-or-less the same as vegetation types or plant ecosystems.

To make these classes easily understood by current users, a team of experts (botanists, ecologists, and GIS and remote sensing specialists) evaluated each class considering its original naming (Langdale-Brown et al, 1964), the existing NFA land cover/land use class and the experts' knowledge of the species assemblage that occurs in that specific locality to generate a shorter name for each class (Figure 3). This shorter name

can now be easily related to the NFA land cover names for which ecosystem metrics have been developed for Uganda. Figure 4 shows the NFA vegetation classes for which ecosystem metrics have been developed.

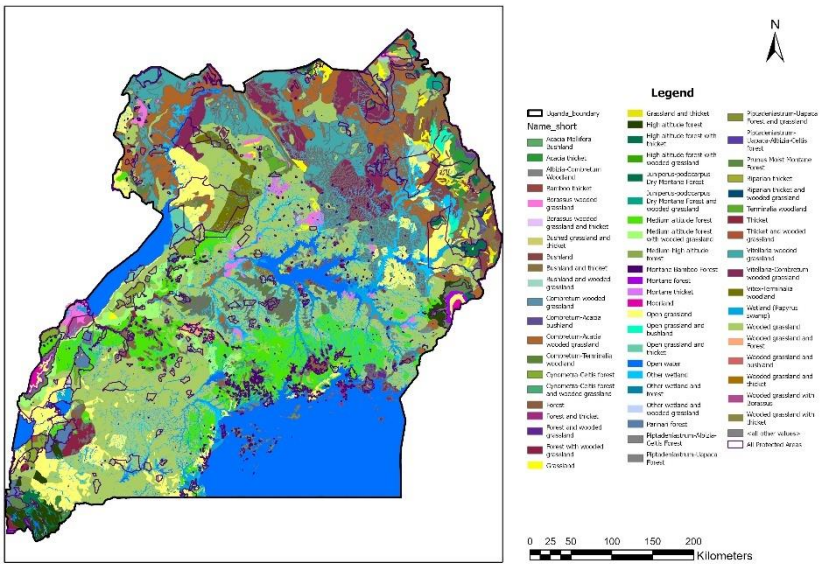

Figure 3: Langdale-Brown et al, 1964 vegetation aligned to NFA's vegetation classes

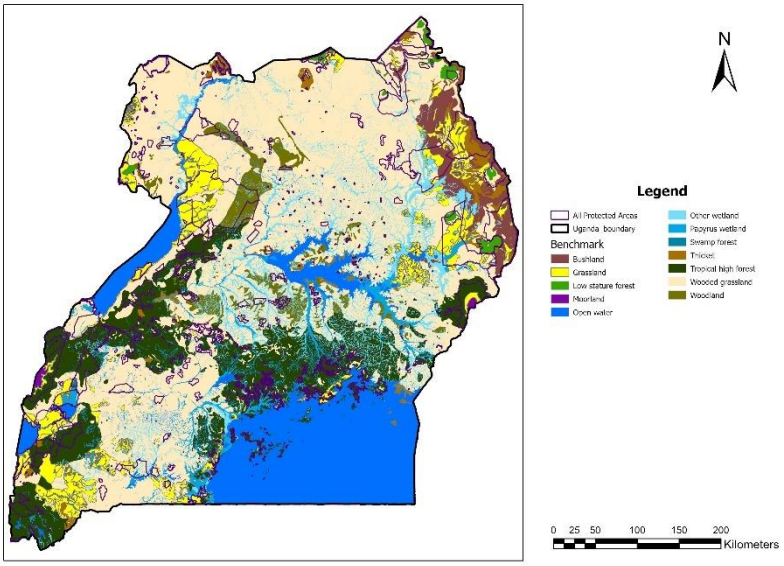

Figure 4: Vegetation types for which benchmark tables have been developed

Utility for the mitigation hierarchy

To effectively develop and apply the mitigation hierarchy and related policies and strategies across Uganda, national-level data on ecosystems are required. Using data from the Langdale-Brown et al (1964) vegetation classification is vital because while much as Uganda's vegetation has been extensively altered over the past few centuries, the Langdale-Brown et al maps can still be considered to represent potential ecosystem distribution over much of the country.

Designing mitigation policy and spatial planning

These historical maps are important in showing past vegetation patterns and the extent of change (biodiversity losses) over time, in giving insights into the likely impacts of proposed activities on ecosystems and their associated species, based on historical trends, and in indicating potential goals for restoration. Combining Langdale brown et al (1964) data on historical ecosystem distribution with current land cover data is useful in conducting assessments of ecosystem loss and degradation, which have already been used to develop a Red List of Ecosystems assessment for Uganda. At the strategic level, understanding where natural ecosystems remain and where areas have been converted due to anthropogenic uses can be highly valuable for identifying priority conservation areas where development should be avoided, and potential development areas. This could support national level reporting on conservation and restoration status. These data may also be useful in predicting – and enabling appropriate interventions to prevent - future biodiversity loss in relation to large-scale landscape changes, assessed over time.

Project-level planning

Evaluating biodiversity losses and gains of proposed projects through the mitigation hierarchy requires the explicit consideration of trends and ecosystem dynamics across scales, and due consideration of projected cumulative changes due to other projects in the same ecosystems, as well as climate change. At a project level, Uganda aims to ensure that there is a no net loss (NNL) of biodiversity because of developments. Data on the historical condition of a site is required for ex-ante evaluations to determine if the project would be able to meet the NNL target. Similarly, if the project were carried out, these data would be used in ex-post evaluations to determine whether the project actually yielded a no net loss or net gain outcome for biodiversity.

Using the Langdale brown et al (1964) map allows developers to understand which ecosystems occur in their project area, and thus which ecosystems they will be required to apply the mitigation hierarchy to. In combination with land cover data, developers can work out where natural areas of each ecosystem remain, using this for both avoidance planning (e.g. moving a road to avoid a particular ecosystem), and for offset planning (e.g. identifying nearby areas of the ecosystems that can be considered for offsets). This dataset also informs stakeholders about the historical assemblage of species which enables species-site matching during site restoration.

Table 1. Langdale-Brown vegetation categorisation (adapted from Pomeroy, et al., 2002)

Biome	L-B Communities		Characteristics
HIGH ALTITUDE	A:	High altitude moorland and heath	Mainly above 3000 m, and including the giant species of Senecio and Lobelia, as well as ice and rock
FORESTED	B:	High altitude forests	Montane forests, above 1500 m, and including bamboo zones in some places
	C:	Medium altitude moist evergreen forests	Widespread below 1500 m
	D:	Medium altitude moist semi-deciduous forests	Also widespread, typically in areas of lower rainfall
	F:	Forest/savanna mosaics	These can extend as high as 3000 m, with forest in the valleys and savanna on ridges, maintained by fire
MOIST SAVANNAS	G:	Moist thickets	Thickets can occur as climax vegetation, but also as post-cultivation precursors of forest
	H:	Woodlands	"… have neither the many-layers structure of the forests nor the dense, dominant grass layer of the savannas" (L-B)

	J:	Moist *Acacia* savannas	Probably derived from forest by “long continued cutting, cultivation and burning” (L-B)
	K:	Moist *Combretum* savannas	Dominated by *Combretum* trees and *Hyparrhenia* grasses
	L:	*Butyrospermum* savannas	Typical of monomodal rainfall zones in areas of former cultivation
DRYLANDS	M:	Palm savannas	Dominated by Borassus palms, the grasslands are maintained by fire
	N:	Dry *Combretum* savannas	Fire influences this type again; *Acacia* is often present too
	P:	Dry *Acacia* savannas	These are long-grass areas, typically with *A. gerrardii* trees
	Q:	Grass savannas	Extensive tall grasslands, dominated by *Themeda triandra* or species of Hyparrhenia
	R:	Tree and shrub steppes	Typical areas with 6-700 mm a year of rain, with many small trees and shrubs
	S:	Grass steppes	Areas of short grass and bare ground, mainly in Karamoja
	T:	Bushlands	These are characteristics of over-grazed areas which would otherwise, be more open savannas
	V:	Dry thickets	Dense spiny trees and shrubs which can become almost impenetrable
WETLANDS	W:	Communities on sites with impeded drainage	Most extensive in valley bottoms, and often with large termite mounds covered by thickets
	ww:	Open water	Not an L-B category, but obviously important. Standing water <6 m deep is classified as a wetland under the Ramsar convention
	X:	Swamps	Permanent swamps, often dominated by *Papyrus* and other macrophytes
	Y:	Swamp forests	Seasonally or in some cases permanently flooded forests occur most notably in the Sango Bay area
POST CULTIVATION	Z:	Post-cultivation communities	In the days of shifting cultivation, post-cultivation communities were widespread: but many are now cultivated more-or-less permanently.

Red List of Ecosystems Assessment

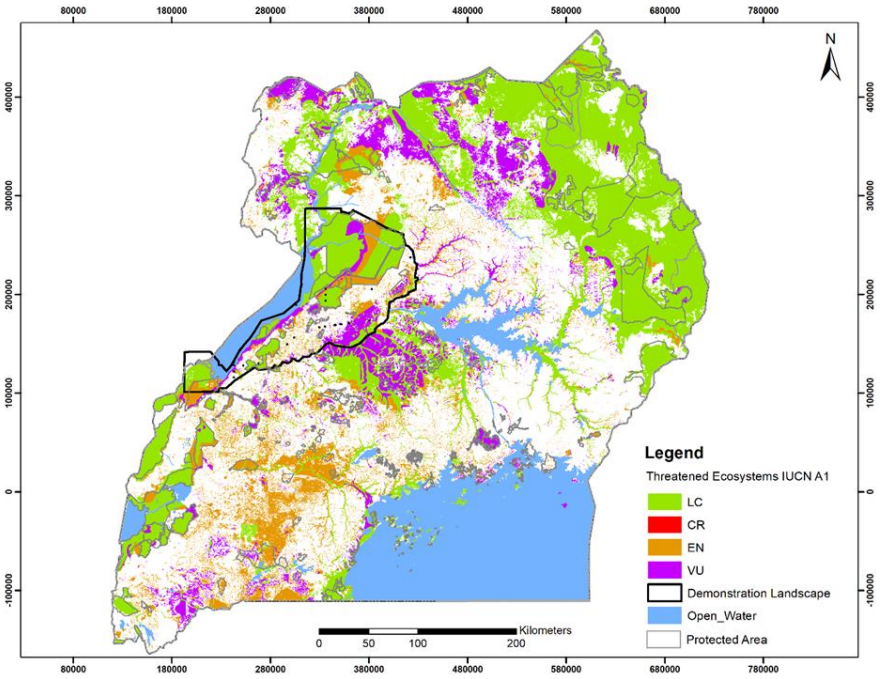

Figure 5: Threatened Ecosystems according to IUCN sub criterion A1 assessment

Description

This dataset describes the conservation status of terrestrial ecosystems in Uganda, assessed using the IUCN Red List of Ecosystems standard[1]. Each ecosystem is assigned a risk category, from collapsed to least concern, following a robust, evidence-based protocol (Figure 5). This is similar to the IUCN Red List of Threatened Species that is widely known, but for ecosystems instead of species.

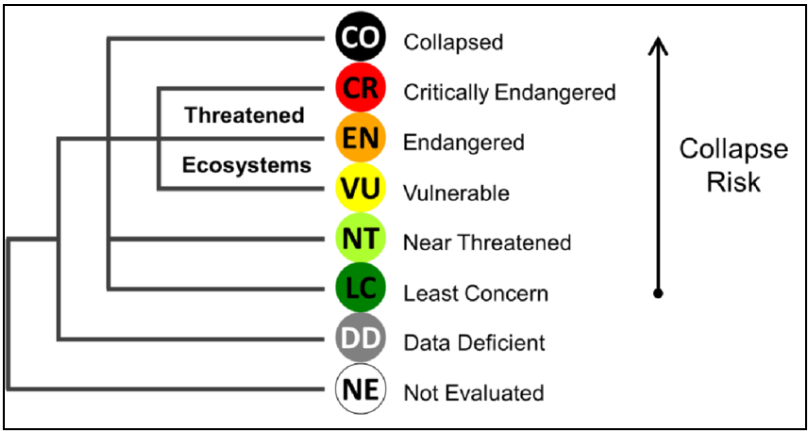

Figure 6. IUCN Red List of Ecosystems categories.

Methods

Most of the natural vegetation that was mapped by Langdale-Brown in 1964 has been converted to other uses. The land cover/land use maps of 1995, 2005, 2010 and 2015 prepared by National Forestry Authority were used to determine the area of natural ecosystems that remained in each of the mapped years. The

[1] Bland et al. 2017. Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria, Version 1.1

resultant maps were used to assess the conservation status of ecosystems in Uganda based on the IUCN criteria A[2].

Criterion A, which is used to evaluate declining ecosystem distribution, was found suitable for assessing the ecosystems of Uganda. In sub criterion A1, 16% of the habitat is considered to have been under cultivation in the start year (1964). The remaining ecosystem coverage is assessed based on its rate of loss and its remaining area coverage compared to its original size. Figure 5 shows the location of threatened ecosystems and Table 4 below shows the area coverage of ecosystems in each threat category. The Critically Endangered (CR) and Endangered (EN) ecosystems identified were all types of savanna or forest/savanna mosaic ecosystems. Most of the grass savannas were mapped as Vulnerable. These constitute the threatened ecosystems per the International Finance Corporation Performance Standard 6 (PS6) because of their declining extent and their increasing fragmentation[3]

Table 4: Area and percentage coverage of ecosystems under each conservation status. Source: WCS and eCountability, 2016

Threat Level	Total Area (Ha)	Percentage
Critically Endangered	582	0.6
Endangered	69645	73.6
Vulnerable	13565	14.3
Least concern	10839	11.5

Utility for the mitigation hierarchy

An ecosystem classification and map is crucial for application of the mitigation hierarchy, as it is the unit by which impacts and offset requirements are calculated. Information on the conservation status of ecosystems is also central to the design of most mitigation policies, which generally place more stringent regulations on development projects that may impact threatened or geographically restricted biodiversity, in an effort to shift development impacts to affect already degraded areas (with limited potential for effective ecological restoration) or less threatened biodiversity

Designing mitigation policy and spatial planning

Red List of Ecosystem data will be useful for designing mitigation policies & guidelines that aim to minimize impacts in highly threatened ecosystems. In many offset/compensation systems, impacts to an ecosystem must be balanced by an offset in the same ecosystem[4]. Understanding the threat status of ecosystems is therefore crucial, in order to design mitigation policies and guidelines that consider ecosystem threat status.

[2] WCS and eCountability, 2016. Critical Habitat Assessment of Exploration Area 2 in the Albertine Graben. Unpublished Report to TUOP

[3] International Finance Corparation (IFC), 2012. IFC Performance Standards on Environment and Social Sustainability. World Bank

[4] BBOP, 2012. Standard on Biodiversity Offsets. Business and Biodiversity Offsets Programme, Washington D.C.

Developments may not be permitted or advisable in highly threatened (Critically Endangered or Endangered) ecosystems, or offset requirements may be scaled to be higher in more threatened ecosystems[5]. Highly threatened ecosystems could also be seen as priority 'offset receiving areas', helping to direct compensation activities for residual biodiversity impacts to these significant areas, to ensure their persistence in good condition in the long term

Utility for project-level planning

For individual projects, Red List of Ecosystem data can be used to inform avoidance measures through broad site selection (e.g., identifying several alternatives and selecting a project area where few or no threatened ecosystems would be impacted) and subsequently through detailed project design (e.g., rerouting a road around a threatened ecosystem). If Uganda's mitigation policies or guidelines have stricter requirements for impacts to threatened ecosystems, then avoiding and minimizing impacts through project planning can deliver win-wins for developers and biodiversity.

Land Use Land Cover Maps

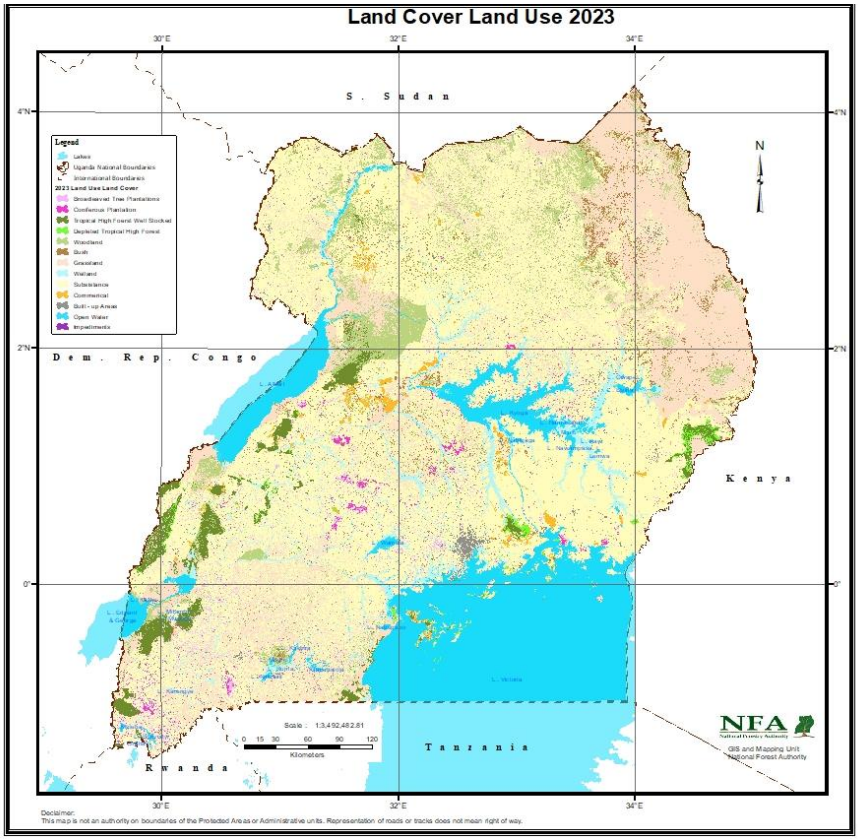

Figure 7: Land Use Land Cover Map for 2023

[5] Brownlie et al., 2017. Biodiversity offsets in South Africa – challenges and potential solutions. Impact Assessment and Project Appraisal 35, 248–256. https://doi.org/10.1080/14615517.2017.1322810

Description

Land Use/Land Cover (LULC) maps are essential in biodiversity conservation because they show the spatial distribution of land use types and their dynamics over time. The maps provide detailed data and information on water bodies (lakes & rivers), wetlands, agricultural areas, built up areas), forest types, rangelands and other land types. This supports spatial based planning, decision making and environmental monitoring which are essential in the sustainable management of biodiversity.

In Uganda, National LULC maps have been developed and published since 1990, with the latest published being the 2023 dataset. Development of these maps utilizes advanced GIS and Remote Sensing tools plus field surveys. The lead institution is National Forestry Authority (NFA). NFA sometimes receives technical support and collaboration from FAO, Regional Centre for Mapping of Resources for Development (RCMRD), USAID, and Intergovernmental Authority on Development's (IGAD) Climate Prediction and Applications Centre (ICPAC), UNDP among others. Sources of data have varied over the years starting with the use of a combination of aerial photographs and topographical maps (Forest Department, 1991) to the use of SPOT and Landsat satellite imagery, and of recent to the use of sentinel imagery, which offers a higher resolution than Landsat. The technical team uses the satellite imagery to extract the land use land cover information and carry out ground truthing to improve map accuracy. The maps have been used to generate time series data that helps in tracking and assessing LULC changes dynamics over the years (Luwa et al, 2020). Of late NFA is trying to integrate the use of UAVs to capture high-resolution aerial photography, especially in LULC change hot spots, for ground truthing of hard to reach areas and for forest inventories.

Utility for the mitigation hierarchy

Designing mitigation policy and spatial planning

LULC data is essential for identification of conservation priorities where development should be minimised/avoided, e.g. areas that are still in their natural state (not affected by anthropogenic activities). Such areas are even of higher importance when they are Key Biodiversity Areas (KBAs), Protected Areas (PAs), Ramsar sites and other important zones. LULC data, in combination with a historical ecosystem map, can be used to track loss of particular ecosystems over time by assessing where natural areas have been converted into anthropogenic land uses. This can be used to inform conservation status assessments such as Red List of Ecosystems assessments, which can in-turn inform development of mitigation policy to limit impacts of development on threatened ecosystems.

LULC maps can also guide the government to track ecosystem loss & degradation trends over time by showing past and present land cover changes. This can be used in the identification of areas that require ecosystem restoration efforts such as re-afforestation, afforestation and agroforestry, which can then inform mitigation policy that can target these areas.

Utility for project-level planning

LULC data is also highly useful for mitigation planning by project developers. Firstly, a robust land cover dataset can be used to identify both natural areas and human land uses, which can be used in avoidance planning where developers aim to reduce impacts of planned projects on natural ecosystems. This can be done through re-locating developments, re-designing technologies and changing project implementation

approach to minimise biodiversity loss. By using LULC data to revise project plans to impact converted or degraded areas, developers can reduce their impacts on biodiversity and their potential offset requirements and costs. If residual impacts persist after avoidance, minimization and restoration efforts, LULC maps can also help in selecting sites for the implementation of biodiversity offsets. By looking at LULC trends over time, in conjunction with a historical ecosystem map, LULC data can be used to identify areas that have or once-held similar ecosystems to the project impacted area. This can be useful to inform scoping of potential offset sites for protection and restoration efforts.

Protected Areas

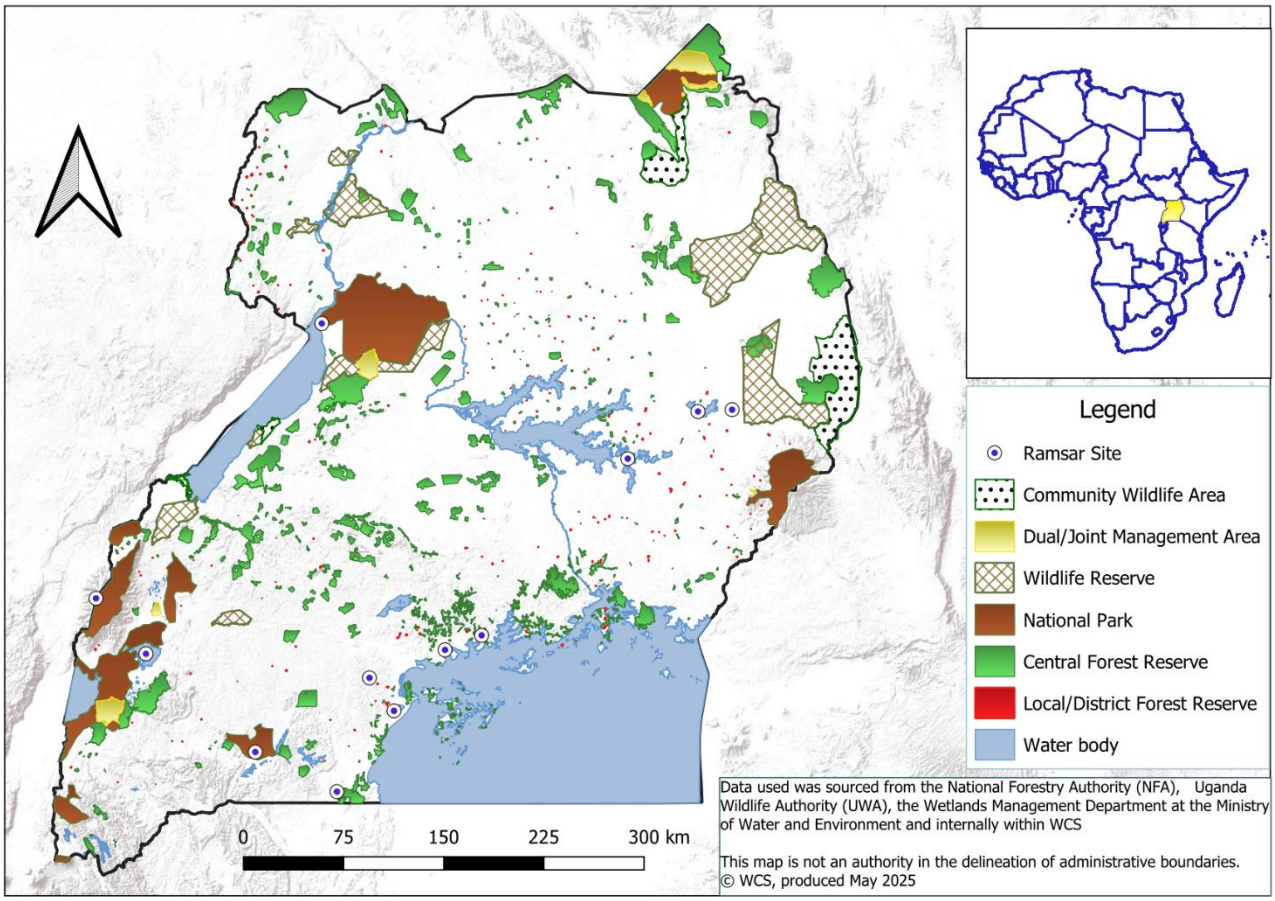

Figure 8: Protected areas in Uganda

Description

Uganda is one of the most biodiversity rich countries in the world. Currently, more than 95% of flora and fauna species are located within the Protected Areas (PA).[6] PA are conservation zones in the form of National Parks, Wildlife Reserves, Community Wildlife Areas, Wildlife Sanctuaries, Special Conservation Areas, Central Forest Reserves and Local-Government Forest Reserves[7] (Figure 8). Human activities within the PAs are highly regulated, except for the community wildlife areas, sanctuaries and special conservation areas, to avoid biodiversity loss. Dual Management areas, on the other hand, are areas co-managed by National Forestry Area (NFA) and Uganda Wildlife Authority (UWA). In 2024, a list of protected wetlands was also released in the gazette.

The total Surface area of Uganda is about 25,981.57km^2 and 24% of this area is gazetted as Central Forest Reserves (CFRs), 10% as wildlife Conservation Areas and 13% as wetlands. The country has a total of 734 Protected Areas composed of 506 central forest reserves and 191 local forest reserves, 10 National Parks, 12 Wildlife Reserves, 5 community wildlife areas and 10 wildlife sanctuaries.[8]

[6] IUCN. World Database on Protected Areas. 2014. https://protectedplanet.net/c/worlddatabase-on-protected-areas
[7] MoWE. Proposed Forest Reference Level for Uganda. Republic of Uganda Ministry of Water and Environment. 2017. http://redd.unfccc.int/files/uganda_frel_final_version_16.01.pdf
[8] State of Wildlife Resources, 2018: https://ugandawildlife.org/wp-content/uploads/2022/03/State_of_Wildlife_Resources_in_Uganda_2018.pdf

Utility for the Mitigation Hierarchy

Datasets on the location of PAs, their extent and the biodiversity they host are essential in the development and application of MH policies. Protected areas should be high priority sites for avoidance, both at the strategic level (i.e. in the design of mitigation policy), and the project level (i.e. for the design of an individual development project). In cases where impacts absolutely cannot be avoided, they should be minimized as much as possible, with offsets used only as a last resort, especially within PAs.

Designing mitigation policy and spatial planning

Data on PAs is essential for designing good mitigation policies, which should, as much as possible, aim to avoid development impacts within PAs. This can be done through the adoption of 'no-go' policies, which totally restrict developments in certain areas, or can be done by placing higher compensation requirements on impacts within PAs. Other useful policies could include policies establishing buffer zones to regulate and restrict development activities in the vicinity of PAs, and policies on the establishment of wildlife corridors for ecological connectivity of the PA. All of these activities can potentially be financed through requirements placed on new development projects. PAs should also be incorporated into biodiversity and social offset policies, which could facilitate the creation of new PAs, or strengthening the protection status of existing PAs through strict legal and institutional frameworks.

Utility for project-level planning

Protected area data can be used by developers to identify a set of high-priority avoidance areas, where impacts should be avoided at all costs. Impacts on PAs can be avoided through broad site selection and revision of detailed project plans. When considering ecosystem restoration, as part of the mitigation hierarchy or for offsets, ecosystems found within PAs may act as good-condition benchmarks to which degraded ecosystems should be restored to. In terms of offsetting, PAs are often essential to deliver NNL or NG, which can occur through identification of offset receiving sites in PAs, as well as creation/expansion of new PAs or improvement of PA protection status such as declaration of a site as a Special Conservation Area.[9]

[9] National Biodiversity and Social Offset Guidelines, 2019

Key Biodiversity Areas

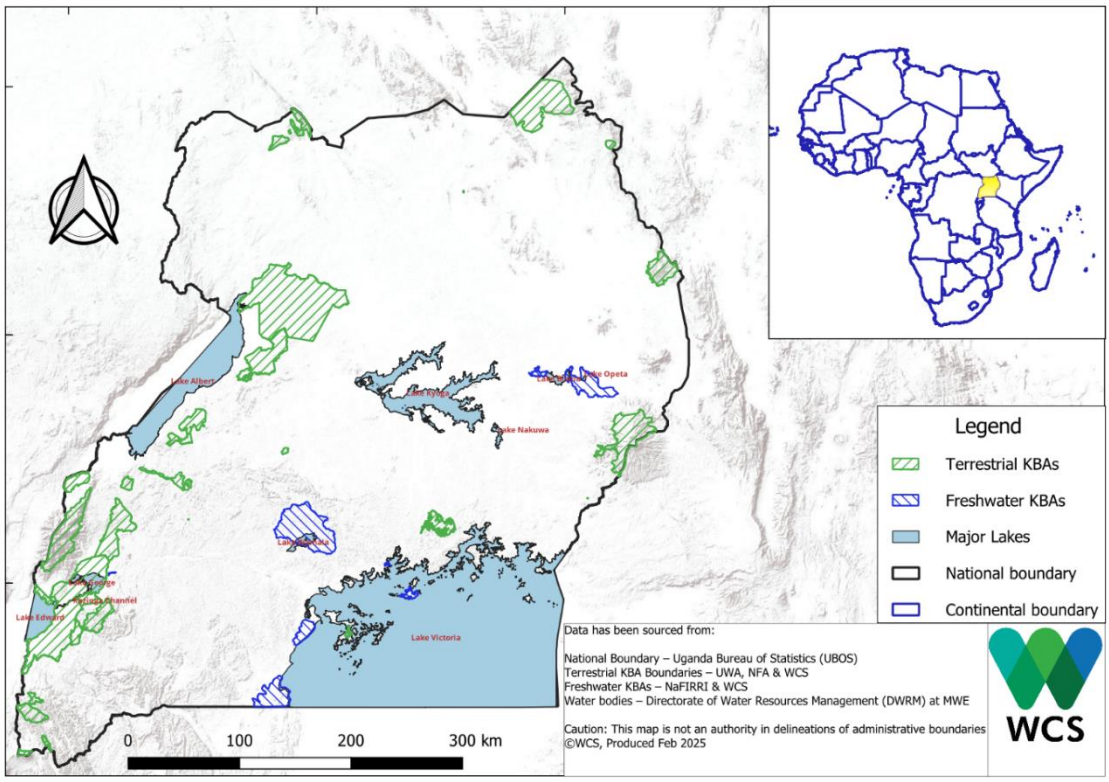

Figure 9: Key Biodiversity Areas (KBAs) in Uganda

Description

This dataset maps areas in Uganda that have been categorised as Key Biodiversity Areas (KBAs) using the global KBA standard[10]. KBAs are defined as "sites that contribute significantly to the global persistence of biodiversity". They help achieve conservation goals because they conserve important ecosystems and viable populations of species, and are identified through a robust scientific process. KBA status is determined through a scientific identification process and is unrelated to legal status or governance type.

The eleven KBA criteria and their associated assessment thresholds are grouped in five categories, namely:

- Globally threatened biodiversity (ecosystems or species under the IUCN Red List of ecosystems or species respectively);
- Geographically restricted biodiversity (ecosystems, species or assemblages of species);
- Ecological integrity (large, intact ecological communities);
- Biological processes (e.g. aggregations of populations, ecological refugia); and
- Irreplaceable biodiversity (quantitative analysis of a site's contribution to one or more species' global persistence)

For a site to be designated as a KBA, it should satisfy at least one of the eleven criteria on the KBA standard.

[10] IUCN, 2016: A Global Standard for the Identification of Key Biodiversity Areas

A total of thirty-six (36) terrestrial/wetland and nine (9) freshwater KBA sites have been identified in Uganda (Figure 9). Of these, twelve (12) sites have been nominated and listed on the World KBA Database as KBAs while plans to upload the remaining 24 proposed sites are in their final stages.

How are KBAs identified?

The Global Standard for the Identification of Key Biodiversity Areas establishes a consultative, science-based process for KBA identification, founded on a standard methodology. The KBA Secretariat based in Cambridge, England, and the KBA National Coordination Groups (NCGs) are the key structures that fulfil the role of coordinating the KBA identification process via a two-tiered process. At national level, the NCG identifies and documents a possible KBA, the information generated is then submitted to the KBA secretariat which verifies the proposal and once deemed suitable, publishes the KBA on the World Database of KBAs[11]. In Uganda, the NCG was established in 2017. It currently has nineteen members drawn from national and sub-national government, academia and civil society organisations in the conservation space.

Utility for the Mitigation Hierarchy

Data on KBAs is critical to the implementation of the mitigation hierarchy in environmental and social impact assessment, and particularly to the avoidance of impacts areas recognised as being important to the persistence of global biodiversity. By flagging these areas through delineation of KBAs, appropriate safeguards can be built into strategic-level policies, programmes and plans, as well as into project-level impact mitigation. Access to data and/or information on KBAs allows stakeholders to know which areas are critical for conservation, and hence to seek alternative locations or sites for development as early as possible in spatial or strategic planning and design stages of projects.

Designing mitigation policy and spatial planning

Overall, data on KBAs should be a crucial consideration in – and support to the development of the national mitigation policy, development plans, strategic environment assessments (SEAs), land-use plans, and other strategic documents that direct different types of development to places that are best suited to support them in the long term.

At a strategic level, KBAs can be used to inform the delineation of no-go zones where developments are not permitted, or to design mitigation systems that place more substantial compensation requirements on impacts that ocur within KBAs. KBAs could also be seen as priority 'offset receiving areas', helping to direct compensation activities for residual biodiversity impacts to these significant areas, to ensure their persistence in good condition in the long term.

Utility for project-level planning

At project-level, KBA data can inform almost every tier of the mitigation hierarchy. The data could be used in determining whether a proposed site should be wholly or partially avoided, including identifying alternatives (location, site, technical, technological, time and/or otherwise) with the view of selecting a project area where KBAs would not be – or would only be minimally - impacted. The data could also inform measures for mitigating residual impacts from projects outside KBAs (e.g. through contributing to

[11] World Database of KBAs

greater protection, restoration and effective management of KBAs, either as offsets, as part of corporate social responsibility, and/ or a developer's contribution to delivering Nature Positive).

In Uganda's National Biodiversity and Social Offset Guidelines[12], areas of significant biological value such as KBAs should generally never receive developments that compromise their ecological integrity. In addition, these Guidelines make it clear that negative impacts on the biodiversity of these areas may be extremely difficult, if not impossible, to offset for a range of ecological, technical or other reasons, and are thus best avoided.

[12] NEMA, 2022: National Guidelines for Biodiversity and Social Offsets

4. APPENDIX

Appendix 1 - Other biodiversity data collected in Uganda

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
Species distribution and abundance, populations, endemism and invasives	Species numbers	Number of flora and fauna species	Known flora and fauna species	Number	National and by National parks, districts	Survey	IUCN, UWA	Summation of flora and fauna species	Readily available IUCN, UWA, NEMA	4 years	The species should be enumerated by habitat and district	None
	Species populations	Number of species populations	Species population	Number	National	Survey	IUCN, UWA	summation of species	Readily available IUCN, UWA, NEMA	4 years	The species should be enumerated by habitat and district	None
	Endemism	Number of endemic flora and fauna species	Endemic flora and fauna species	Number	National	Survey	IUCN, UWA	Summation of endemic species	Readily available IUCN, UWA, NEMA	4 years	The species should be enumerated by habitat and district	None
	Invasives	Number of Invasive alien flora and fauna species	Invasive alien flora and fauna species	Number	National	Survey	IUCN, UWA	Summation of invasive species	Readily available IUCN, UWA, NEMA	4 years	The species should be enumerated by habitat and district	None
Protected areas, wildlife use and wildlife crime	Coverage (area)	Area of wildlife protected areas Level of protection	Protected terrestrial and aquatic area	Hectares	By protected area/zone	Administrative	UWA	Direct measurement of area protected	Available on request from UWA, UWEC	Annual	The data should be readily available for easy protection from encroachments	None
		Total area of forests (including natural forests and plantations)	Total forest area Types of forests-THF, woodlands, montane,	Hectares Percentage	National	Survey/monitoring system	NFA	Total area of land covered by forest divided by total land area, multiplying by 100	Available on request NFA, annual statistical abstracts-UBOS	5 years	The data need to be annually updated for easy monitoring	None

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
		Area under natural forests	Natural forests: Tropical high forests, montane or riverine forests	Hectares percentage	National	Survey/monitoring system	NFA	Total area under natural forests divided by total land area and multiplied by 100	Available on request NFA, annual statistical abstracts-UBOS	5 years	The data need to be annually updated for easy monitoring	None
		Area under planted forests	Planted forests: coniferous or deciduous	Hectares percentage	National	Survey/monitoring system	NFA	Total area under planted forests divided by total land area and multiplied by 100	Available on request NFA, annual statistical abstracts-UBOS	5 years	The data need to be annually updated for easy monitoring	None
		Area under protected forests	Protected forest area Unprotected forest	Hectares percentage	National	Survey/monitoring system	NFA/UWA	Total area under protected forests divided by total land area and multiplied by 100	Available on request NFA, annual statistical abstracts-UBOS	5 years	The data need to be annually updated for easy monitoring	None
		Area under forest affected by fire	Forest area affected by fire	Hectares Percentage	National	Survey/monitoring system	NFA	Total area under forests affected by fire divided by total land area and multiplied by 100	Available on request NFA, annual statistical abstracts-UBOS	5 years	The data need to be annually updated for easy monitoring	None
	Regulated wildlife use and wildlife crime		Number of permits for hunting issued in a year	Number	By type of wild animal	Monitoring system	UWA	Summation of permits for hunting issued in a year	Readily available on request at UWA, MTWA	Annual	The data are available we just need an updated rational database	
		Number of animals allowed by permits	Number of animals allowed by permits	Number	By type of wild animal	Monitoring system	UWA	summation of animals allowed by permits	Readily available on request at UWA, MTWA	Annual	The data are available we just need an updated rational database	

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
		Imports of endangered species	Endangered species that are imported	Number	By type of species	Monitoring system	UWA	Summation of endangered species imported	Readily available on request at UWA, MTWA	Annual	The data are available we just need an updated rational database	
		Exports of endangered species	Endangered species that are exported	Number	By type of species	Monitoring system	UWA/UWEC	Endangered species that exported	Readily available on request at UWA, UWEC, MTWA	Annual	The data are available we just need an updated rational database	
		Reported wild animals killed or trapped for food or sale	Wild animals reported killed or trapped in the communities	Number	By type of species	Monitoring system	UWEC	Summation of wild animals reported killed or trapped in communities	Readily available on request at UWEC, MTWA	Annual		
		Trade in wildlife and captive –bred species	Number of wildlife animals that are captured	Number	By type of wild animal	Monitoring system	UWA	Summation of wildlife animals captured	Readily available on request at UWEC, MTWA	Annual	The data are available we just need an updated rational database	
Land cover and land use	Land cover	Area under land cover categories	Area under land cover categories of Forests, Grassland, settlements, cropland, wetlands and others	Hectares, percentage	National, regional, type of land cover	Survey (remote sensing and ground truthing) inventory	NFA	Total area of land cover by type divided by total land area and multiplied by 100	Readily available NFA database, annual statistical abstract-UBOS	5 years	The land cover should be disaggregated by districts as well.	None Global datasets are not ground-truthed and are more generalised
		Volume of biomass	Total	Volume	National	Survey/monitoring system	NFA	Quantitative	Available on request NFA, annual statistical abstracts-UBOS	5 years	The data need to be annually updated for easy monitoring	None

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
		Forest	Area under forests	Hectares percentage	By national and land use category	Survey (remote sensing and ground trotting)	NFA	Total area under grassland divided by total area and multiplied by 100	Readily available at NFA, annual statistical abstract-UBOS	5 years		
		Crop land	Area under crop land	Hectares	By national and land use category	Survey (remote sensing and ground trotting)	NFA	Weighted sum of all land under crops	Readily available at NFA, annual statistical abstract-UBOS	5 years		None
		Grassland	Area under grassland	Hectares, percentage	By national and land use category	Survey (remote sensing and ground trotting)	NFA	Total area under grassland divided by total area and multiplied by 100	Readily available at NFA, annual statistical abstract-UBOS	5 years		
		Wetland	Area under wetlands	Hectares percentage	By national and land use category	Survey (remote sensing and ground trotting)	NFA	Total area under wetlands divided by total area and multiplied by 100	Readily available at NFA, annual statistical abstract-UBOS	5 years		
		Settlements	Area under settlements	Hectares percentage	By national and land use category	Survey (remote sensing and ground trotting)	NFA	Total area under settlements divides by total area and multiplied by 100	Readily available at NFA, annual statistical abstract-UBOS	5 years		
		Other	Area under other	Hectares percentage	By national and land use category	Survey (remote sensing and ground trotting)	NFA	Total area under other divide by total area and multiplied by 100	Readily available at NFA, annual statistical abstract-UBOS	5 years		

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
		Area of ecosystems	Area of forests, wetlands, water bodies	Hectares/square kilometres	National/ district level	Survey (remote sensing and ground trotting)	NFA	Total area of ecosystems divided by total land area and multiplied by 100	Readily available NFA database, annual statistical abstract-UBOS	5-year	Ecosystems should be generated by districts	None
	Land use: Crops	Area planted	Area planted under each crop	Hectares	By crop	Survey /census	MAAIF	Weighted sum of all land under each crop	Readily available at UBOS	2 years – surveys 10 years-census		None
		Production	Production of each crop per unit area	Tonnes/ha	By crop	Survey /census	MAAIF	Total production of each crop per unit area	Readily available at UBOS	2 years – surveys 10 years-census		None
		Imports	Number of imports of crops and their fertilizers	Currency USD$	Type of fertilizer	Monitoring system	URA/MTIC	Summation of crop imported and their fertilizers by type	Readily available at URA/MTIC, annual statistical abstract-UBOS	Annual		None
		Exports	Number of crops exported to other countries	Tonnes	By crop	Monitoring system	URA/MTIC	Summation of crop exported and their fertilizers by type	Readily available at URA/MTIC, annual statistical abstract-UBOS	Annual		None
	Land use: Livestock	Stocks of livestock	Number of livestock of different types	Number	By type of livestock	Survey	MAAIF/UBOS	Summation of livestock animals by category	UBOS			
		Imports of livestock	Value of livestock imports brought in Uganda	Currency USD	By type of product	Monitoring system	MAAIF/UBOS	Summation of values of livestock imports	Readily available at URA/MTIC, annual statistical abstract-			

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
		Exports of livestock	Number of livestock animals and products exported out of the country	Number or tonnes	By type of livestock and product	Monitoring system	MAAIF/UBOS	Summation of livestock animals and products exported by type	Readily available at URA/MTIC, annual statistical abstract-	Annual		None
	Land use: Human settlements	Population in informal settlements	Number of people residing in areas that are not gazetted for residential	Number, percentage	National, sub-national, Urban	Household surveys and census	UBOS	The number of people residing in areas that are not gazetted for residential divided by the total population and multiplied by 100	UBOS	Annual	Data readily available	None
		Population living in Urban areas	Total number of people living in urban areas	Number Percentage	National, sub-national, district	Census, Household surveys	UBOS	Total persons residing in urban areas Number of persons residing in urban areas divided by the total population in the country multiplied by 100	UBOS	Census-10 years Surveys-2 years	The data on populations are readily available in almost all UBOS reports	None
		Population living in rural areas	Total number of people living in rural areas	Number Percentage	National, sub-national, district	Census, Household surveys	UBOS	Total persons residing in rural areas Number of persons residing in rural areas divided by the total population in the country multiplied by 100	UBOS	Census-10 years Surveys-2 years	The data on populations are readily available in almost all UBOS reports	None

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
		Total urban area	Total Area of urban centres	Hectares	National, sub-national, district	Census, Household surveys	UBOS	Total Area of urban centres divided by the total area in the country multiplied by 100	UBOS	Census-10 years Surveys-2 years	The data on populations are readily available in almost all UBOS reports	None
		Total rural area	Total area of rural	Hectares	National, sub-national, district	Census, Household surveys	UBOS	Total Area of rural centres divided by the total area in the country multiplied by 100	UBOS	Census-10 years Surveys-2 years	The data on populations are readily available in almost all UBOS reports	None
	Forests	Carbon storage in living forest biomass	Mass of carbon stored by existing forests	Mass	National	Survey/monitoring system	NFA	Quantitative	Available on request NFA, annual statistical abstracts-UBOS	5 years	The data need to be annually updated for easy monitoring	None
		Non-wood forest products and other plants	Non- timber products traded in the different districts	Number		By type of product	MTWA	Monitoring system	Summation of non-timber products traded in different districts	Annual	Readily available at MTWA	The data are available we just need an updated national database
		Production of timber and other products	Production of the different timer resources in Uganda	Tonnes		By timer category	NFA	Monitoring system	Summation of quantities of timber and other products produced	Annual	Readily available at NFA, annual statistical abstract-UBOS	None
	Fish	Imports of fish and fish products	Amount of fish and fish products imported	Currency USD$	By type of product	Summation of fish and fish products imported	MAAIF	Monitoring system	Readily available at URA/MTIC	Annual		None
		Exports of fish	Amount of fish and fish products exported	Tonnes	By type of fish	Monitoring system	MAAIF	Summation of fish and fish products exported	Readily available at URA/MTIC, annual statistical abstract-UBOS	Annual		

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
		Fish Production/catch	Amount of fish catch from the fresh water bodies	Tonnes	By water body	Monitoring system	MAAIF	Summation of fish catch from the freshwater bodies	Readily available at MAAIF, annual statistical abstract-UBOS	Annual		
Access to ecosystem services	Water	Population using an improved drinking water source	Population having access to improved water sources	Number, Percentage	National, sub-national, rural, urban	Household surveys, Census	UBOS	The number of people who use an improved water source divided by the total population and multiplied by 100	The data on populations are readily available in almost all UBOS reports	Census 10 years Surveys 2 years		
		Population supplied by water supply industry	Number of households connected to the National water system and DWD system	Number, percentage	National, sub-national, rural, Urban	Household surveys and census	UBOS, NWSC, MWE	The number of households connected to the National water system and DWD system divided by the total households multiplied by 100	Annual statistical abstract-UBOS, NWSC, MWE sector performance report	Annual	Data readily available	None
		Price of water	The cost of cubic meter of water	Currency, UGX	National, sub-national, rural, Urban	Administrative records	UBOS, NWSC, MWE	water units multiplied by cost per cubic meter	Annual statistical abstract-UBOS, NWSC, MWE sector performance report			
	Sanitation	Population using an improved sanitation facility	Number of households with access to improved sanitation	Number, percentage	National, sub-national, rural, Urban	Household surveys and census	UBOS	The number of people who use an improved sanitation facility divided by the total population and multiplied by 100	Census-10 years	Surveys-2 years		None

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
		Population served by municipal waste collection	Population living in municipalities that are covered by waste collection system	Number, percentage	National, sub-national, rural, Urban	Household surveys and census	UBOS	The number of people living in municipalities that are covered by waste collection system divided by the total population and multiplied by 100	UBOS	Census-10 years Surveys-2 years	Data readily available	None
		Population connected to wastewater collection system	Number of households connected to wastewater collection system	Number, percentage	National, sub-national, rural, Urban	Household surveys and census	UBOS, NWSC, MWE	The number of households connected to wastewater collection system divided by the total households multiplied by 100	Annual statistical abstract-UBOS, NWSC, MWE sector performance report	Annual	Data readily available	None
		Population connected to wastewater treatment	Number of households connected to the sewerage system	Number, percentage	National, sub-national, rural, Urban	Household surveys and census	UBOS, NWSC, MWE	The number of households connected to the sewerage system divided by the total households multiplied by 100	Annual statistical abstract-UBOS, NWSC, MWE sector performance report	Annual	Data readily available	None
	Electricity	Population with access to electricity	Number of Household that are connected to electricity supply	Number, percentage	National, sub-national, rural, Urban	Administrative records	UBOS, MEMD UMEME	The number of households Household that are connected to electricity supply divided by the total households multiplied by 100	Annual statistical abstract-UBOS, MEMD sector performance report	Annual	Data readily available	None

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
		Cost of a unit of electricity		Currency UGX	National, sub-national, rural, Urban	Administrative records	UBOS, MEMD UMEME	electricity units multiplied by cost per watts	Annual statistical abstract-UBOS, MEMD sector performance report	Annual	Data readily available	None
Biodiversity data and information systems; and perception and awareness	Existence of publically accessible biodiversity data and information system	A system that collects and captures biodiversity data /information in one place	Description	There is system in place		NEMA/UBOS	Descriptive	NEMA/UBOS	NEMA/UBOS	Annual	Although a lot of biodiversity data and information are collected by different MDAs and DLGs, there is no national information system in place	None
	Description of national biodiversity data/information programmes	Programme for the development and updating biodiversity data and information	Description			Currently environment statistics is just being developed	NEMA/UBOS	Descriptive				
	Knowledge and attitudes about biodiversity l issues or	Perceptions and attitudes of the population on biodiversity management	Description		By NBSAP strategic objectives	Survey	UBOS	Descriptive	UBOS	2 years	Data are scantly available	None
	Knowledge and attitudes about environmental policies	Knowledge and attitude of the population about biodiversity policies	Description		By NBSAP strategic objectives	Survey	UBOS	Descriptive	UBOS	2 years	Data are scantly available	None
Biodiversity education	Biodiversity education programmes in schools	Description of biodiversity education programmes running in schools	Description	By type of programme	Administrative records	Descriptive	MOES	Descriptive	MOES/schools	Annual	Data are scantly available, not well organised	None

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
	Number of students pursuing biodiversity l related higher	Number of students pursuing biodiversity related higher education	Number	By course and university	Administrative records	Descriptive	MOES, Universities	Summation of total number of students by course and university	MOES, Universities	Annual	Data are readily available	None
	Annual government environmental protection expenditures	Annual government expenditures on the protection of environment and other natural resources	Annual government expenditures on the protection of environment and other natural resources	Currency, UGX	National, by MDAs, District Local Government (DLGs)	Administrative records	MFPED	Summation of total monetary value of annual government expenditure on the protection of environment and other natural resources	MFPED approved budget allocations	Annual	Data are readily available	None
Biodiversity protection; government and Civil Society engagement	Private sector environmental protection and resource management expenditures	Amount of budget spent by the private sector in the protection and management of the environment and other natural resources	National, by private sector entity, environmental activity	Currency, UGX	Administrative records	Summation of total monetary value of budget spent by the private	PSFU reports	Summation of total monetary value of budget spent by the private sector in the protection and management of the environment and other natural resources	The data are available on request	Annual	Data are available on request	None
	Annual non-profit institutions environmental protection and management expenditures	Amount of funds spent by NGOs in protection and management of the environment in different parts of the country		Currency, UGX	National, By NGOs and environmental activity	Administrative records	NGO forum	Summation of total monetary of funds spent by NGOs in protection and management of the environment in different parts of the country	NGO forum reports, Annual sector performance reports	Annual	Data are available on request	None

Thematic area	Sub-theme	Biodiversity data indicator	Description of data	Unit of measurement	Disaggregation	Compilation practices	Sources of data	Computation method	Accessibility & availability of data	Frequency of production	Comments and limitations	Sources of discrepancies
	Existence of pro-biodiversity NGOs and their resources	Existence of pro-biodiversity NGOs and their resources	Existence of pro-biodiversity NGOs and their resources	Currency, UGX	By NGO	Administrative records	NGO Forum	Summation of total monetary value of existence of pro-biodiversity NGOs and their resources	NGO Forum	Annual	Available on request	None
	Number of biodiversity activities	Number of biodiversity activities	Number of biodiversity activities	Number	By activity and NGO	Administrative records	NGO Forum	Summation of total number of biodiversity activities		Annual	Available on request	None
	Number of biodiversity programmes	Number of biodiversity programmes	Number of biodiversity programmes	Number	By programme and NGO	Administrative records	NGO Forum	Summation of total number of biodiversity programmes	NGO Forum	Annual	Available on request	None