LAND COVER ATLAS OF THE REPUBLIC OF SOUTH SUDAN

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The Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA) is a Government of South Sudan (GOSS) programme funded by the European Union (EU) and implemented by the Food and Agriculture Organization of the UN (FAO).

SIFSIA aims at strengthening human, physical and institutional capacity in analysing, designing, monitoring and evaluating food security policies and programmes.

Its overall aim is to build sustainable food security in South Sudan.

Main Outputs

- → Improved food security institutional and operational framework
- → Strengthened government capacity in livelihoods and food security policy analysis and programming
- → Crop and livestock market information system
- → Crop and livestock monitoring and forecasting system
- → Natural resources monitoring system
- → Nutrition information system
- → Food security research fund

FAO in South Sudan has been closely working with GOSS partners to:

- → Collect, analyze and disseminate information on crop and livestock market prices, crop production and rangeland, nutrition, land cover, weather and its effects on crops
- → Build appropriate food security institutions
- → Promote capacity building activities contributing to food security by supporting the strengthening of policy and planning initiatives

FAO, Land and Water Division (NRL) has completed a new land cover of South Sudan with the technical input of the Global Land Cover Network (GLCN) and the support of the SIFSIA project.

SIFSIA has established a framework for the development of land cover products for South Sudan. The information derived from the consistent assessment of natural resources and land cover will be used as a decision support product to assist numerous government institutions, such as the ones below.

- → The Ministry of Agriculture and Forestry will benefit from a baseline dataset on availability of agricultural land and information on land cover. The dataset will form a basis for a new agricultural statistics methodology for crop production estimation and it will improve the assessment of food security.
- → The Ministry of Environment will receive support in the management and monitoring of the status of natural resources including woody biomass.
- → The Ministry of Animal Resources and Fisheries will be supported in the management of the natural resources for livestock production.
- → The Land Commission will benefit from the monitoring of the distribution of agricultural land.

FOREWORD

South Sudan is endowed with abundant natural resources with a potential in agriculture, fisheries, livestock and forestry. Although the agricultural sector's development represents the major source of growth in the country's economy, it is well below its potential.

Crop and livestock productions are the central livelihood strategies in South Sudan. Food insecurity is generally caused by a combination of inadequate agricultural inputs, frequent displacement as a result of inter and intra-ethnic conflicts, late and uneven distribution of rainfall, uncontrolled crop pests, insufficient agricultural extension services and inadequate policies and programmes.

Responding to these needs, FAO-SIFSIA is working closely with the government to build the capacities of key institutions including the Ministry of Agriculture and Forestry, the Ministry of Animal Resources and Fisheries, the Ministry of Health, the National Bureau of Statistics, the South Sudan Relief and Rehabilitation Commission and the Ministry of Transport and Roads (Department of Meteorology). One of the main objectives is to establish an evidence-based decision-making system that provides policy and strategic guidance to the rural sector on food security. Key programme activities so far include: (i) overall policy framework for food security defined and operational; (ii) institutional set-up for food security established and functioning to enhance coordination and strengthen vertical and horizontal linkages; (iii) relevant policies and programmes designed and updated for strengthening smallholders' livelihoods and protecting the vulnerable; and (iv) relevant food security information accessed and used by relevant stakeholders.

In the framework of the FAO-SIFISIA programme, it was considered to undertake an update of the land cover database of South Sudan, already created under the GLCN East Africa Module (Africover, *circa* 2000). The updated dataset provides reliable information on the current state of land cover and distribution of major land cover classes. The updated land cover is instrumental to support agricultural statistical analysis as well natural resources assessment, monitoring and management.

FAO, Land and Water Division (NRL), in close partnership with FAO-SIFSIA and GOSS, prepared the Land Cover Atlas of the Republic of South Sudan. The atlas provides multipurpose information to support the management, control, planning and utilization of natural resources, in particular sustainable management of the limited agricultural areas.

ABSTRACT

The Land Cover Atlas of the Republic of South Sudan provides information on the land cover distribution by administrative and sub-basin divisions. The dataset was created using the FAO/GLCN methodology and tools. Main data sources include satellite imagery from SPOT and Global Land Survey (GLS) Landsat, existing Africover land cover database and ancillary data.

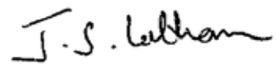
The legend was prepared using the Land Cover Classification System (LCCS): a comprehensive, standardized *a priori* classification system, designed to meet specific user requirements and created for mapping exercises, independent of the scale or means used to map. The classification uses a set of independent diagnostic criteria that allows the correlation with existing classifications and legends.

Satellite images of South Sudan were segmented into homogeneous polygons and they were interpreted according to the FAO/GLCN methodology for the production of a seamless and detailed land cover dataset for the whole country. A field verification was completed by national experts who received a customized training on methodology and tools.

The final land cover product has around 100,000 polygons, classified into 43 different classes and eventually aggregated into 7 major classes for ease of analysis and display.

The atlas is organized into three main sections: country, states and sub-basins. Each section provides information on the distribution of aggregated land cover as map and table. These products provide the user with valuable information on the availability and distribution of land resources through a multi-faceted approach.

The delivery of boundaries is in accordance with The Government of South Sudan.



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ACKNOWLEDGEMENTS

The publication of the Land Cover Atlas of the Republic of South Sudan is the result of the outstanding efforts of many institutions and individuals working in close partnership. The following paragraphs attempt to acknowledge everyone who supported and contributed to this atlas.

The publication of the atlas was made possible by the contributions (financial and in-kind) of the partner organizations involved in the SIFSIA programme: the Government of South Sudan (GOSS), the Food and Agriculture Organization of the United Nations (FAO) and the European Union (EU), which funds the SIFSIA Programme.

This activity was implemented in collaboration with the Ministry of Agriculture and Forestry (MAF), the Ministry of Animal Resources and Fisheries (MARF), the National Bureau of Statistics (NBS), the Remote Sensing Authority (RSA), the Forests National Corporation (FNC) and other relevant stakeholders in the Republic of South Sudan.

We acknowledge also the cooperation of the following institutions and experts for their support in the process of the update of the South Sudan land cover (image interpretation and classification, field verification, dissemination and uptake): Ali Said (Chief Technical Advisor, FAO-SIFSIA Programme in South Sudan), Elijah Mukhala (FAO-SIFSIA Information Systems & Capacity Building Specialist). The efforts of GOSS staff that undertook field validation activities travelling extensively under difficult circumstances in the most remote areas of South Sudan cannot be under estimated. These include; Noel Francis Laku (MAF), Alex Tiangwa Wani (NBS), Robert Zakayo (MWRI) and Ahmed Foude-Moula (MARF).

Image processing, photo-interpretation, database creation, map production: John Latham, Renato Cumani, Ilaria Rosati, Luigi Simeone, Giulio Marchi, Antonio Di Gregorio, Saverio Stoppioni, Rosanna Padelletti, Lorenzo Vita.

The contribution of all of the above, along with input from many other unnamed people has been vital for the success of this project.

Assistance in preparing the atlas for publication was received from Ane Louise Gaudert (graphic design) and Giulio Marchi, Renato Cumani and Paola Cárdenas (editing).

ADG	Advanced Database Gateway
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FNC	Forests National Corporation
GLCN	Global Land Cover Network
GLS	Global Land Survey
GOSS	Government of the Republic of South Sudan
GeoVIS	Geographical Vector Interpretation System
LCCS	Land Cover Classification System
MAD-CAT	Mapping Device Change Analysis Tools
MAF	Ministry of Agriculture and Forestry
MAP	Mapping Accuracy Program
MARF	Ministry of Animal Resources and Fisheries
MMU	Minimum Mapping Unit
NBS	National Bureau of Statistics
NRL	Natural Resources - Land and Water division
RSA	Remote Sensing Authority
SIFSIA	Sudan Institutional Capacity Programme: Food Security Information for Action
UN	United Nations
UTM	Universal Transverse Mercator

TABLE OF CONTENT

METHODOLOGY

Management practices need detailed, reliable and up-to-date information on the status of the land, most often obtained from land cover maps, as well as information on changes of inland cover over time, depicting eventual trends in land conversions. Developing countries are usually most affected by the lack of assessment data and monitoring tools, making their future management decisions more difficult.

FAO is heavily involved in the development of tools for supporting countries in the assessment of land cover and monitoring it over time. Starting from the development of technical tools for land cover mapping and change assessment, to the standardization of procedures for land cover classification and analyses, FAO's work represents a significant contribution to the development of tools that provide essential land cover data needed for management purposes.

In the framework of SIFSIA, FAO is assisting the national institutions of GOSS to undertake the assessment of land resources using FAO methodology and tools.

The activities for the creation of the land cover dataset consisted in three main phases: i) image interpretation and classification; ii) field verification; iii) capacity building, including dissemination of results and training.

The main objective was the preparation of an accurate, up-to-date land cover dataset of South Sudan in order to allow effective and focused decision making about rehabilitation activities and development planning, especially for the country's agricultural sector.

The dataset provides up-to-date and reliable information on land cover distribution in South Sudan needed for sustainable land management.

Methodology, tools, definitions, data sources, legend, maps and statistics are provided in the following chapters.

Chapter 2 describes the methodology used for the creation of an integrated imagery coverage based on existing land cover products to extract agricultural areas.

Chapter 3 provides information on the land cover legend derived from LCCS and details on the major "Primarily Vegetated Areas" and "Primarily Non-Vegetated Areas".

Chapter 4 describes the steps followed to create the final database.

Chapter 5 lists the full resolution land cover classes and their aggregations.

Chapter 6 includes all the land cover maps and statistics by country, states and sub-basins. All the maps included in the atlas are prepared in UTM 35 N projection (WGS 84). Administrative divisions are provided by the National Bureau of Statistics.

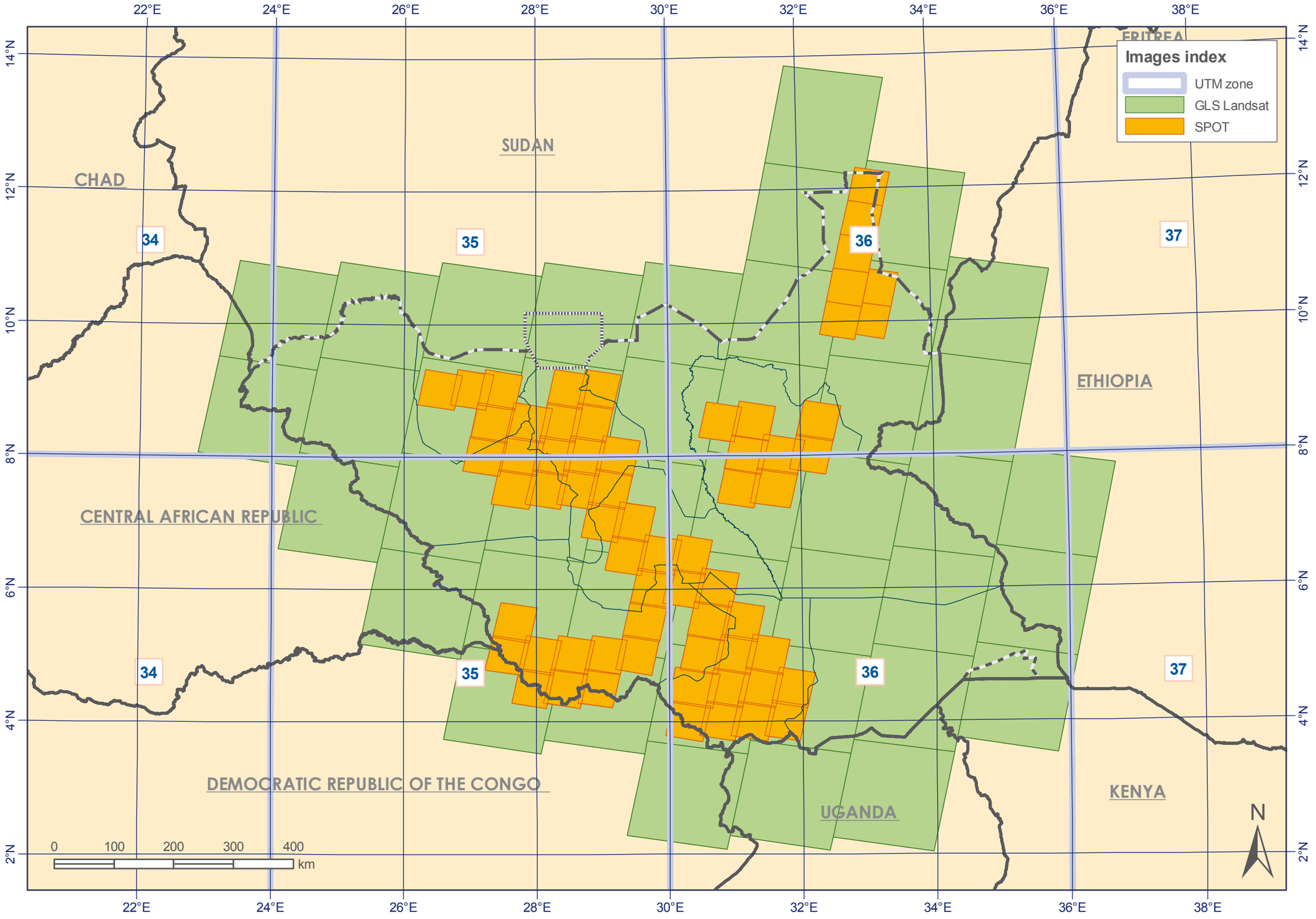


Figure 1 - GLS Landsat and SPOT images index

METHODOLOGY

The methodology implemented for the creation of the land cover database is based on the FAO/GLCN approach. The major steps of the compilation of the database include creation of an integrated imagery coverage, image processing and interpretation and validation. FAO/GLCN toolbox[1] is used to implement the methodology.

2.1. Integrated imagery coverage

The South Sudan land cover mapping is carried out with the interpretation of an integrated coverage of GLS Landsat satellite images and updated higher resolution SPOT images covering the agricultural areas (see Figure 1). This approach is adopted to improve the accuracy of the interpretation and to emphasize the land cover features in the agricultural production areas, derived from the existing Africover Sudan data base dated *circa* 2002.

2.1.1 Satellite data acquisition

GLS LANDSAT

GLS Landsat images are acquired for the whole extent of South Sudan, dating from *circa* 2000 and *circa* 2005-2007.

SPOT

A review of the available SPOT images is carried out to get the best coverage for the agricultural areas and the images are acquired, dating from *circa* 2006-2008.

2.1.2 Quality control / images replacement

The acquisitions are analysed and the quality of the images is assessed for eventual replacements. The accuracy of the geometric correction and the cloud coverage is checked to evaluate if the data meet the quality requirements needed for the interpretation.

2.2 Image processing and interpretation

2.2.1 Segmentation

Image segmentation is based on a region-merging technique of the divisions of the image into spatially continuous and spectrally homogeneous regions or objects. The segmentation produces a vector layer of objects that represent regions with similar pixel values with respect to some characteristic or computed property such color, intensity or texture.

Different segmentation parameters are applied to the two types of imagery due to their diverse spatial ground resolutions and spectral characteristics. Several tests are performed in order to achieve the best procedure since the number of the output polygons and the quality of the image segments in the vector layer are strictly linked to the segmentation parameters and it is important to reach a good compromise between level of detail and number of polygons. The segmentation of GLS Landsat and SPOT images is used to prepare the vector layers.
The Africover Sudan database is used as a source during the interpretation process. Existing Africover database labels are assigned to each polygon of the vector layer. This information is very useful particularly for natural vegetation.

2.2.2 Photo-interpretation

The photo-interpretation procedure uses the satellite imagery, the land cover legend based on LCCS, existing land cover products, photo-keys and tools. Mapping Device Change Analysis Tools (MAD-CAT) software developed by FAO is used for the photo-interpretation.

The interpretation follows a precise procedure with a standard sequence of operations. The first phase is the preliminary interpretation, when the interpreter studies the image and all the available data and assigns a land cover label to each object. The Minimum Mapping Unit (MMU) used in the interpretation phase is 2 ha.

Next, a subset of areas is selected and ground-checked with a systematic fieldwork campaign. This procedure gives the possibility to minimize the interpretation errors and to improve the level of detail and the quality of the final output.

The final phase is the correction of interpretation errors and the harmonization of the land cover dataset.

2.3 Validation

The fieldwork is conducted by national experts with supervision and guidance from FAO/GLCN experts using the standardized field survey form and methodology. Survey points, photos and field observations are collected during the surveys for the final revision of the land cover dataset.

The local knowledge resulted in obtaining timely and consistent information on the current land cover classes. Remote sensing techniques combined with *in situ* measurements enabled to generate reliable and efficient information. The contribution of the national experts is crucial also to address issues of remoteness, security or accessibility.

During the first validation phase, Central Equatoria, Western Bahr el Ghazal, Northern Bahr el Ghazal and Lakes states were surveyed for a total of 31 field surveys (see red circles in Figure 2). The second validation phase is performed in the states of Warrap and Western Equatoria. At the end of the field verification campaign, a total of *circa* 50 sample areas are checked and used for the final land cover database.

[1] LCCS, MAD-CAT (MApping Device–Change Analysis Tool), GeoVIS (Geographical Vector Interpretation System), MAP (Mapping Accuracy Program) and ADG (Advanced Database Gateway) software (http://www.glcn.org/sof_0_en.jsp)

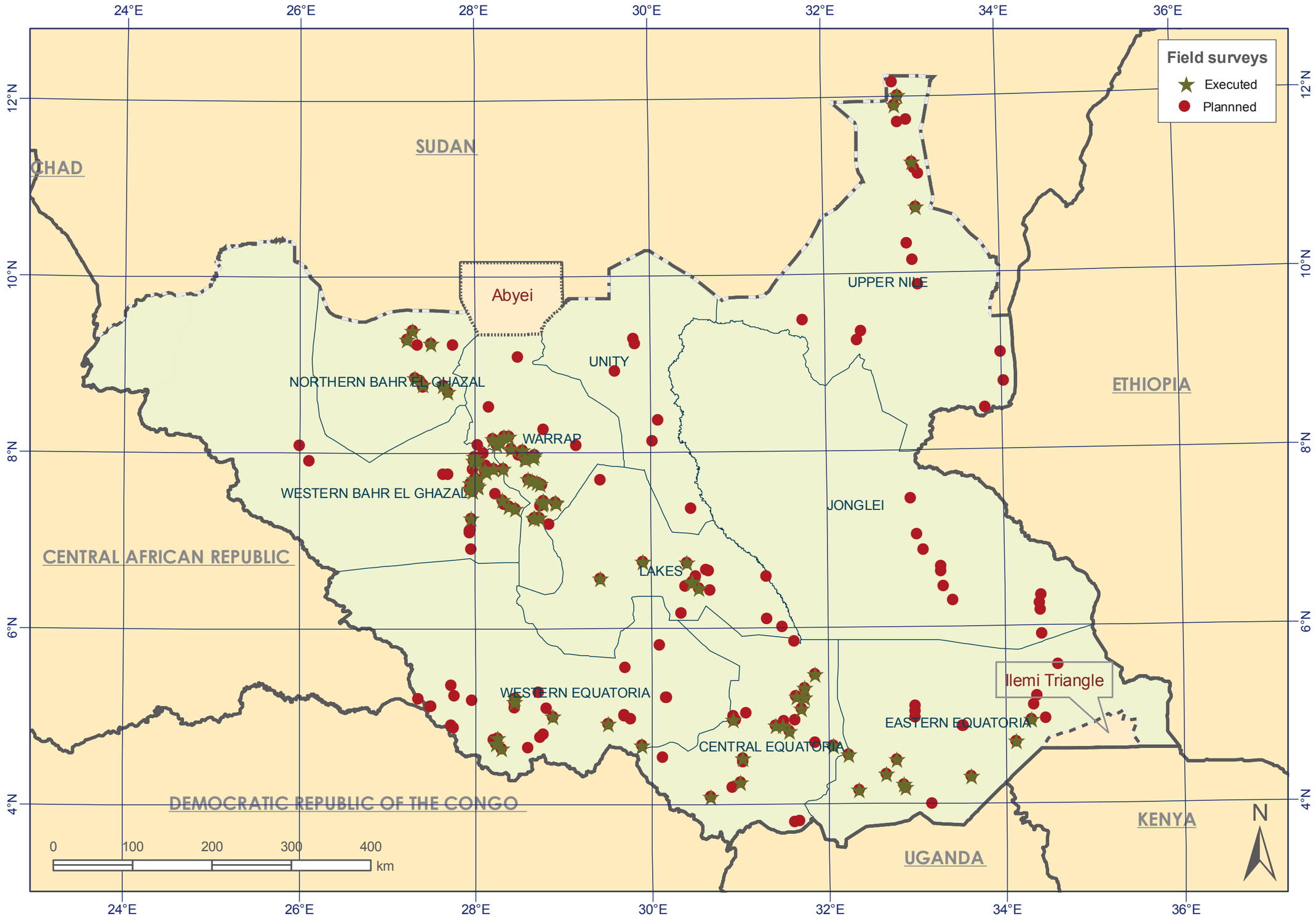


Figure 2 - Field validation areas

LEGEND

The FAO/GLCN Land Cover Classification System (LCCS) approach generates a structured legend compatible with similar LCCS-derived products around the globe. The main classes of the legend are described in the next paragraphs.

3.1 Primarily Vegetated Areas

3.1.1 Natural and Semi-Natural Vegetation

Natural and Semi-Natural Vegetation (A12)
Natural vegetated areas are defined as areas where the vegetative cover is in balance with the abiotic and biotic forces of its biotope. Semi-natural vegetation is defined as vegetation not planted by humans but influenced by human actions. These may result from grazing, possibly overgrazing the natural phytocenoses, or else from practices such as selective logging in a natural forest whereby the floristic composition has been changed. Previously cultivated areas that have been abandoned and where vegetation is regenerating are also included. This classifier is "Primarily vegetated Terrestrial Artificiality of Cover: (Semi-) natural" (LCCS, 2005). The class represents around 80% of the total area of South Sudan.

Natural and Semi-Natural Aquatic or Regularly Flooded Vegetation (A24)
This class describes areas that are transitional between pure terrestrial and aquatic systems and where the water table is usually at or near the surface or the land is covered by shallow water. The predominant vegetation, at least periodically, comprises hydrophytes. Marshes, swamps, bogs or flats where drastic fluctuations in water level or high concentration of salts may prevent the growth of hydrophytes are all part of this class. The vegetative cover is significantly influenced by water and dependent on flooding (e.g. mangroves, marshes, swamps and aquatic beds). Natural Vegetated Aquatic habitats are defined as biotopes where the vegetative cover is in balance with the influence of biotic and abiotic forces. Semi-Natural Aquatic vegetation is defined as vegetation that is not planted by humans but which is influenced directly by human activities that are undertaken for other, unrelated purposes. This classifier is "Primarily vegetated Aquatic or Regularly Flooded Artificiality of Cover: (Semi-) natural" (LCCS, 2005). The class represents around 15% of the total area of South Sudan.

3.1.2 Cultivated and Managed Terrestrial Areas

Cultivated and Managed Terrestrial Areas (A11)
This class is "Primarily vegetated Terrestrial Artificiality of Cover: Artificial/managed". It refers to areas where the natural vegetation has been removed or modified and replaced by other types of vegetative cover of anthropogenic origin. This vegetation is artificial and requires human activities to maintain it in the long term. In between the human activities, or before starting crop cultivation, the surface can be temporarily without vegetative cover. All vegetation that is planted or cultivated with intent to harvest is included in this class (LCCS, 2005). This class is concentrated on the north coast and other scattered small areas. The class represents around 4% of the total area of South Sudan.

Cultivated Aquatic or Regularly Flooded Areas (A23)
This class includes areas where an aquatic crop is purposely planted, cultivated and harvested, and which is standing in water over extensive periods during its cultivation period. In general, it is the emerging part of the plant that is fully or partly harvested (LCCS, 2005). The class represents less than 1% of the total area of South Sudan.

3.2 Primarily Non-Vegetated Areas

3.2.1 Artificial Surfaces and Associated Areas

Artificial Surfaces and Associated Areas (B15)
This class describes areas that have an artificial cover as a result of human activities such as construction (cities, towns and transportation), extraction (open mines and quarries) or waste disposal. The classifier is "Primarily non-vegetated Terrestrial Artificiality of Cover: Artificial/managed" (LCCS, 2005). This class is scattered all over South Sudan and it represents only a small percentage of the country's area. The class represents less than 1% of the total area of South Sudan.

3.2.2 Bare Areas

Bare Areas (B16)
This class describes areas that do not have an artificial cover as a result of human activities. These areas include areas with less than 4% vegetative cover. Included are bare rock areas, sands and deserts. This classifier is: "Primarily non-vegetated Terrestrial Artificiality of Cover: (Semi) natural" (LCCS, 2005). It is a class rarely present in South Sudan landscape. The class represents less than 1% of the total area of South Sudan.

3.2.3 Artificial - Natural Waterbodies, Snow and Ice

Natural Waterbodies, Snow and Ice (B28)
This class refers to areas that are naturally covered by water, such as lakes, rivers, snow or ice. In the case of rivers, the lack of vegetation cover is often due to high flow rates and/or steep banks. In the case of lakes, their geological origin affects the life conditions for aquatic vegetation. The classifier is "Primarily non-vegetated Aquatic or Regularly Flooded Artificiality of Cover: (Semi-) natural" (LCCS, 2005). The class represents less than 1% of the total area of South Sudan.

DATABASE COMPILATION

Following the completion of the land cover interpretation, the resulting dataset was spatially verified and harmonized. Procedures for edge matching and topology control were applied in order to check and to adjust for bordering polygons, small polygons, overlaps or gaps, etc. This operation included the matching of the subsets for the two UTM zones (35 and 36 N) of the country which were processed separately.

The final South Sudan land cover dataset can be summarized as follows:

- → around 100,000 polygons covering an interpreted area of about 65,887,000 ha
- → 43 single classes used for the interpretation
- → 7 aggregated classes
- → 290 mixed units deriving from combinations of single classes

AGGREGATION

The 43 original land cover classes were aggregated into 7 generalized and self-explicative classes. The result is an aggregation which keeps a good level of information though providing a quick estimate of the different land cover typologies.

The following table describes the aggregation of the main classes into 7 aggregated classes:

1. Agriculture in terrestrial and aquatic/regularly flooded land (**AG**)
2. Trees closed to very open in terrestrial and aquatic/regularly flooded land (**TCO**)
3. Shrubs closed to sparse in terrestrial and aquatic/regularly flooded land (**SCO**)
4. Herbaceous closed to sparse in terrestrial and aquatic/regularly flooded land (**HCO**)
5. Urban areas (**URB**)
6. Bare Rocks and Soil and/or Other Unconsolidated Material(s) (**BS**)
7. Seasonal/perennial, natural/(artificial) Waterbodies (**WAT**)

LCCS CODE	LCCS LABEL	AGG[1]
1HM-is	Scattered Isolated Field(s) Of Rainfed Herbaceous Crop(s)	AG
1Hs-is	Scattered Isolated Small Sized Field(s) Of Rainfed Herbaceous Crop(s)	AG
1SHs-is	Scattered Isolated Small Sized Field(s) Of Rainfed Shrub Crop(s) (One Additional Crop) (Herbaceous Terrestrial Crop With Simultaneous Period)	AG
1HL	Rainfed Herbaceous Crop(s)	AG
1HL+2TS	Rainfed Herbaceous Crop(s) + Sparse Trees	AG
1HLi	Permanently Cropped Area With Surface Irrigated Herbaceous Crop(s) (One Additional Crop) (Herbaceous Terrestrial Crop Sequentially) .	AG
1HM	Rainfed Herbaceous Crop(s)	AG
1HM+2TS	Rainfed Herbaceous Crop(s) + Sparse Trees	AG
1HMi	Permanently Cropped Area With Surface Irrigated Herbaceous Crop(s) (One Additional Crop) (Herbaceous Terrestrial Crop Sequentially) .	AG
1HS	Small Sized Field(s) Of Rainfed Herbaceous Crop(s)	AG
1HS+2TS	Small Sized Field(s) Of Rainfed Herbaceous Crop(s) + Sparse Trees	AG
1Hsi	Permanently Cropped Area With Small Sized Field(s) Of Surface Irrigated Herbaceous Crop(s) (One Additional Crop) (Herbaceous Terrestrial Crop Sequentially) .	AG
1Hs-Y	Post Flooding Cultivation Of Small Sized Field(s) Of Herbaceous Crop(s)	AG
1SHs	Small Sized Field(s) Of Rainfed Shrub Crop(s) (One Additional Crop) (Herbaceous Terrestrial Crop With Simultaneous Period) . Crop Cover: Orchard(s)	AG
1TPL	Permanently Cropped Area With Rainfed Tree Crop(s) Crop Cover: Plantation(s)	AG
1TPLBD-t	Permanently Cropped Area With Rainfed Broadleaved Deciduous Tree Crop(s)	AG
2HCO	Herbaceous Closed to Open Vegetation	HCO
2HCOTS	Closed to Open Herbaceous Vegetation with Trees and Shrubs	HCO
2HR	Sparse Herbaceous Vegetation	HCO
2SC	Closed Shrubland (Thicket)	SCO
2SO	Open Shrubs (Shrubland)	SCO
2SR	Sparse Shrubs	SCO
2TCS	Trees with Shrubs	TCO
2TOS	Woodland with Shrubs	TCO
3HL	Large Sized Field(s) Of Graminoid Crops On Permanently Flooded Land Dominant Crop: Cereals - Rice (Oryza spp.)	AG
3HM	Medium Sized Field(s) Of Graminoid Crops On Permanently Flooded Land Dominant Crop: Cereals - Rice (Oryza spp.)	AG
4HCF	Closed Herbaceous Vegetation On Temporarily Flooded Land. Water Quality: Fresh Water	HCO
4HCFF	Closed to Open Herbaceous Vegetation On Permanently Flooded Land Water Quality: Fresh Water	HCO
4HCTF	Closed Herbaceous Vegetation With Emergents On Temporarily Flooded Land Water Quality: Fresh Water	HCO
4SCHF	Closed to Open (100-40)% Shrubs With Herbaceous Vegetation On Temporarily Flooded Land.	SCO
4SCHFF	Closed to Open (100-40)% Shrubs With Herbaceous Vegetation On Permanently Flooded Land	SCO
4TCF	Trees On Temporarily Flooded Land. Water Quality: Fresh Water	TCO
4TOF	Woodland On Temporarily Flooded Land. Water Quality: Fresh Water	TCO
5A	Non-Linear Built Up Area(s) Built-Up Object: Airport	URB
5OF	Built Up Area(s) Built-Up Object: Other - Oil Fields	URB
5U	Urban Area(s)	URB
6R	Bare Rock(s)	BS
6S	Bare Soil And/Or Other Unconsolidated Material(s)	BS
8WFBS	Non-Perennial Natural Waterbodies (Flowing) (Surface Aspect: Sand)	WAT
8WFP	Perennial Natural Waterbodies (Flowing)	WAT
8WFT	Non-Perennial Natural Waterbodies (Flowing) (Surface Aspect: Bare Soil)	WAT
8WSP	Perennial Natural Waterbodies (Standing)	WAT
8WST	Non-Perennial Natural Waterbodies (Standing) (Surface Aspect: Bare Soil)	WAT

[1] AGG: aggregated class

COUNTRY LAND COVER

LEGEND

Roads

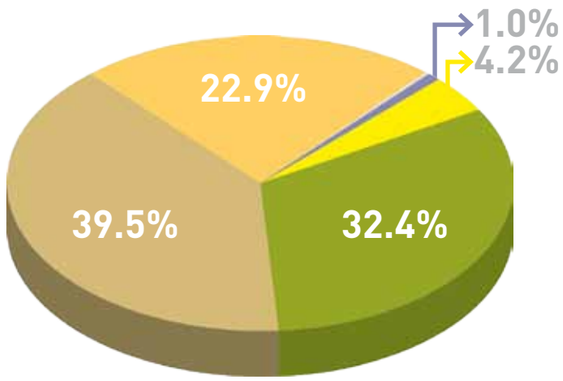
- Primary
- Secondary
- Tertiary
- Rivers
- Lakes

Administrative Boundaries

- International Boundary
- State Boundary
- County Boundary
- Administrative Boundary

Land Cover

- Agriculture in terrestrial and aquatic/regularly flooded land
- Trees closed-to-sparse in terrestrial and aquatic/ regularly flooded land
- Shrubs closed-to-sparse in terrestrial and aquatic/ regularly flooded land
- Herbaceous closed-to-sparse in terrestrial and aquatic/ regularly flooded land
- Urban areas
- Bare Rocks and Soil and/ or Other Unconsolidated Material(s)
- Seasonal/perennial, natural/artificial waterbodies

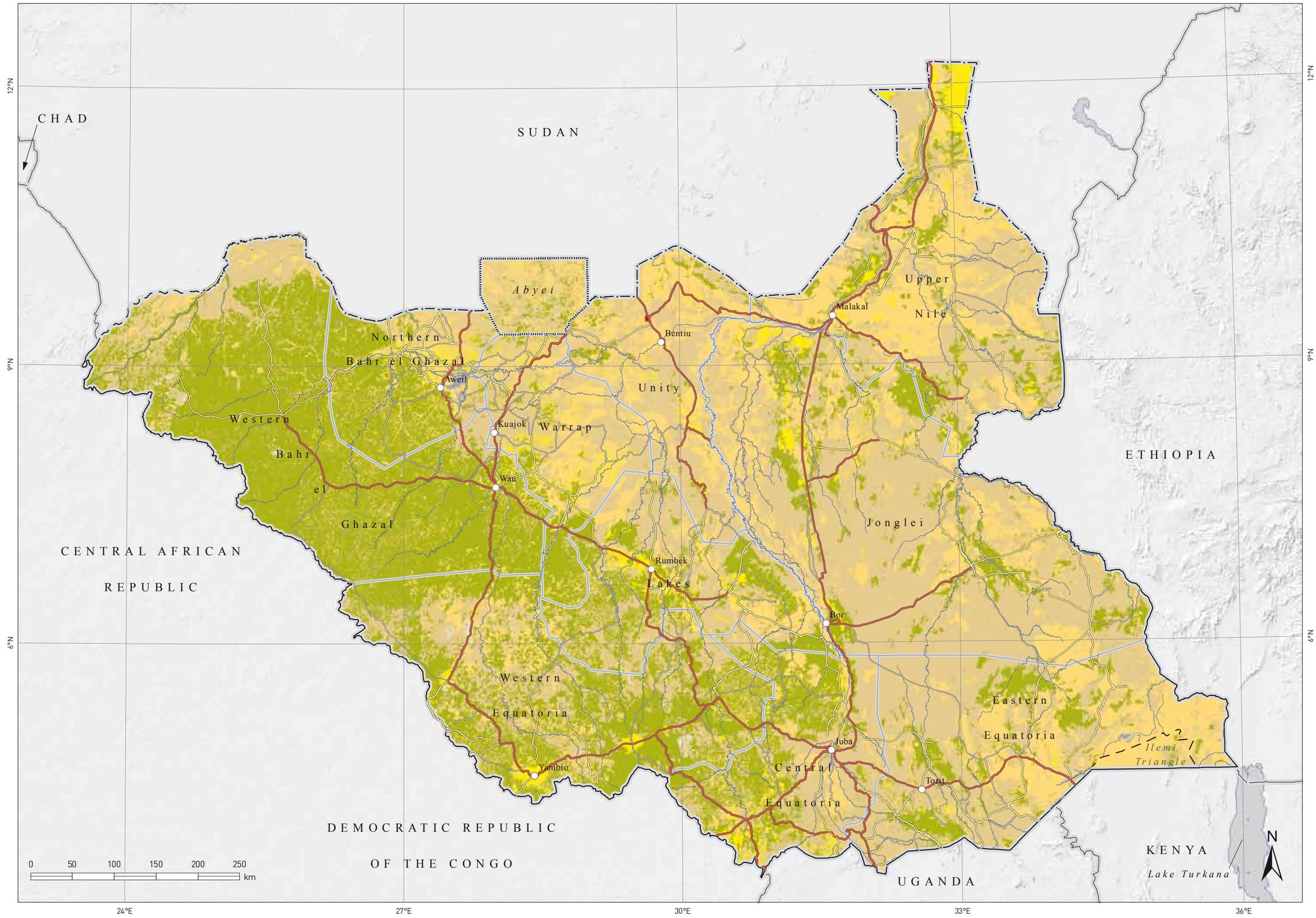


Note: Only classes representing more than 0.5 % of the area are shown in the chart

INDEX MAP

LAND COVER CLASSES IN HECTARES

STATES	AG Agriculture in terrestrial and aquatic/regularly flooded land	TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	URB Urban areas	BS Bare Rocks and Soil and/or Other Unconsolidated Material(s)	WAT Seasonal/ perennial, natural/artificial waterbodies	TOTAL AREA
Central Equatoria	381,319	1,579,928	1,790,141	608,580	8,399	10,191	12,011	4,390,569
Eastern Equatoria	113,470	1,082,624	3,916,004	2,277,351	952	2,874	32,262	7,425,537
Jonglei	318,658	1,554,901	7,546,217	2,837,251	942	864	101,214	12,360,047
Lakes	184,241	1,564,445	1,698,524	920,276	1,766	18,238	20,018	4,407,508
Northern Bahr el Ghazal	242,158	1,577,372	500,125	567,891	1,196	1,764	91,373	2,981,879
Unity	126,871	196,030	1,934,868	1,488,220	6,387	2,310	34,319	3,789,005
Upper Nile	485,833	998,466	3,045,912	3,249,108	7,854	13,180	34,360	7,834,713
Warrap	448,399	754,630	1,922,541	1,295,033	1,412	15,180	8,136	4,445,331
Western Bahr el Ghazal	134,745	7,643,670	1,607,242	803,222	3,525	36,116	112,246	10,340,766
Western Equatoria	341,532	4,373,605	2,077,592	1,021,064	1,757	78,713	17,703	7,911,966
TOTAL	**2,777,226**	**21,325,671**	**26,039,166**	**15,067,996**	**34,190**	**179,430**	**463,642**	**65,887,321**

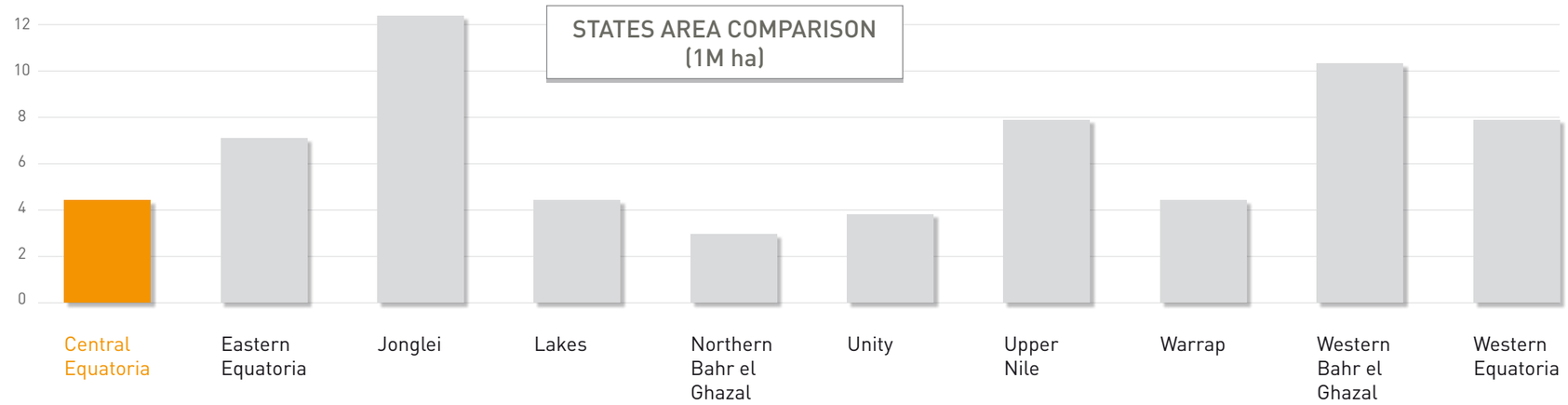

24°E
27°E
30°E
33°E
36°E
12°N
9°N
CHAD
SUDAN
ETHIOPIA
CENTRAL AFRICAN
REPUBLIC
DEMOCRATIC REPUBLIC
OF THE CONGO
UGANDA
KENYA
Abyei
Northern
Bahr el Ghazal
Western
Bahr
el
Ghazal
Unity
Upper
Nile
Jonglei
Lakes
Warrap
Western
Equatoria
Central
Equatoria
Eastern
Equatoria
Awerl
Kuajok
Wau
Rumbek
Bentiu
Malakal
Bor
Juba
Yambio
Torit
Ilemi
Triangle
Lake Turkana
0
50
100
150
200
250
km
N

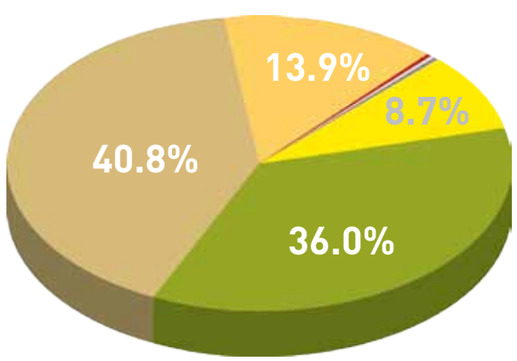
Land cover by:

STATE

Land cover maps and statistics are compiled for the whole country and for each South Sudan state. The land cover distribution is reported in the tables as disaggregated at the second administrative level.

CENTRAL EQUATORIA



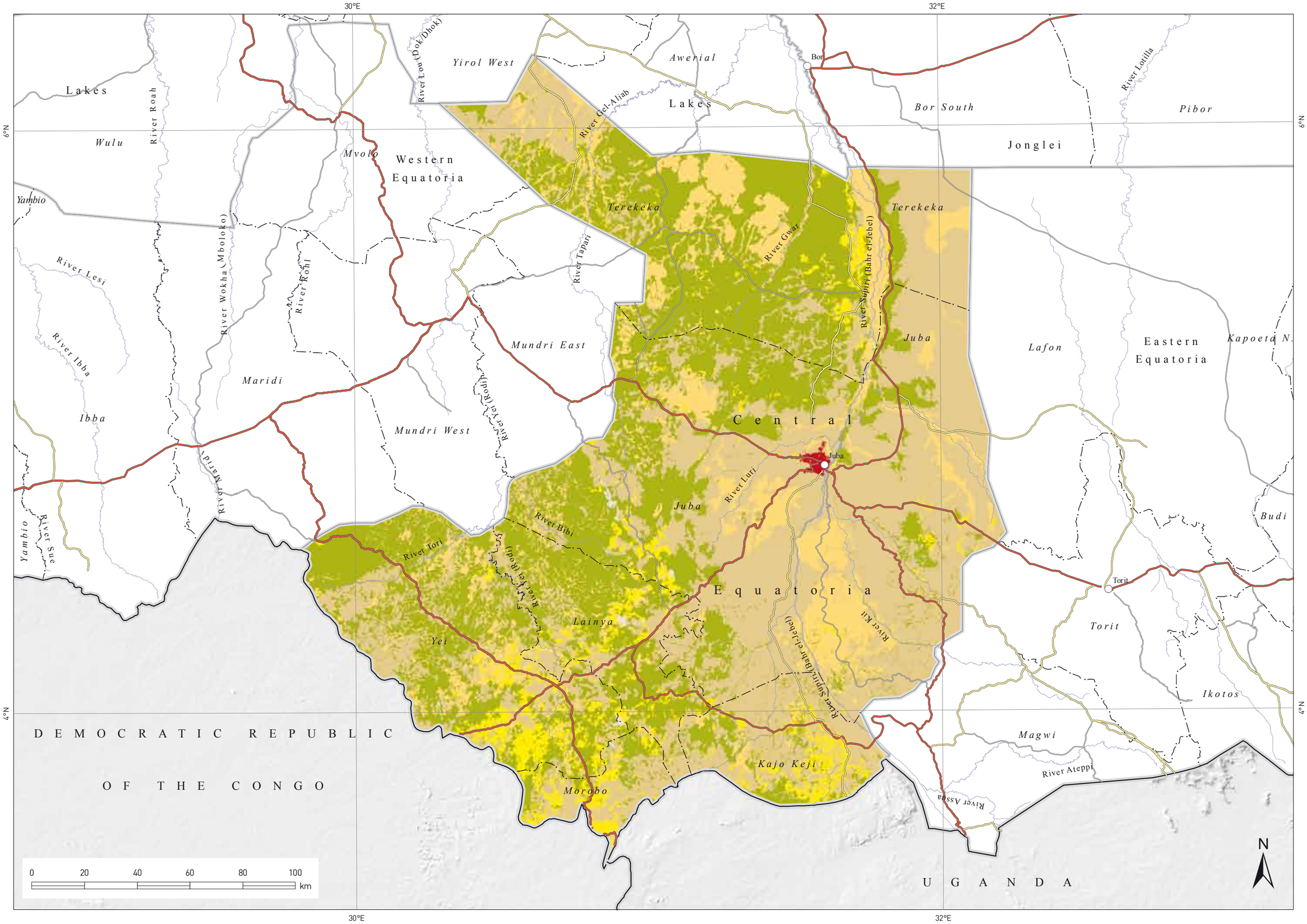


Note: Only classes representing more than 0.5 % of the area are shown in the chart

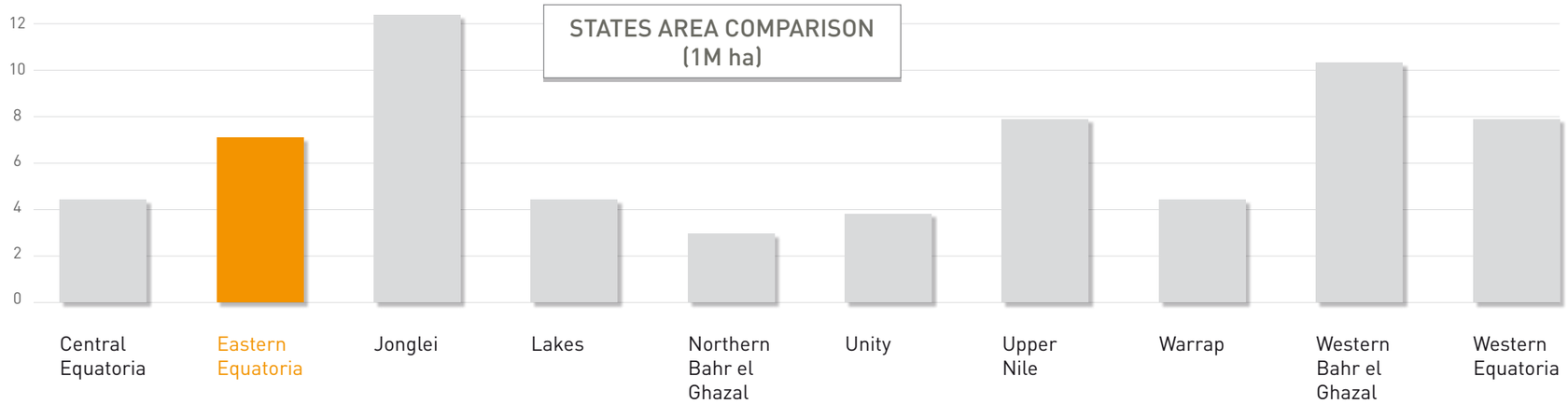
INDEX MAP

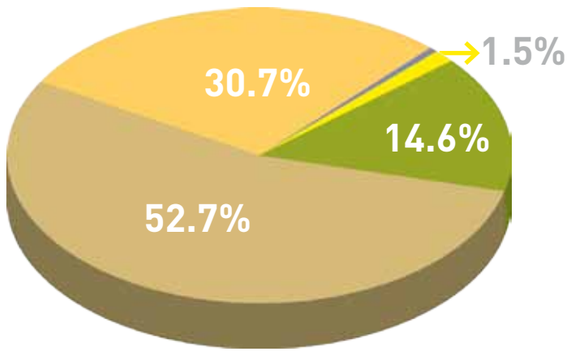
LAND COVER CLASSES IN HECTARES

COUNTY	AG Agriculture in terrestrial and aquatic/regularly flooded land	TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	URB Urban areas	BS Bare Rocks and Soil and/or Other Unconsolidated Material(s)	WAT Seasonal/ perennial, natural/artificial waterbodies	TOTAL AREA
Juba	72,380	477,040	1,062,419	259,164	7,319	4,487	6,251	1,889,060
Kajo Keji	59,978	50,691	145,511	8,143	0	334	345	265,002
Lainya	50,126	185,963	83,019	24,789	4	1,787	155	345,843
Morobo	55,592	26,958	51,099	1,685	92	236	0	135,662
Terekeka	46,579	530,492	284,013	218,086	23	864	5,036	1,085,093
Yei	96,664	308,784	164,080	96,713	961	2,483	224	669,909
TOTAL (ha)	**381,319**	**1,579,929**	**1,790,141**	**608,580**	**8,399**	**10,190**	**12,010**	**4,390,569**


30°E
32°E
6°N
4°N
Lakes
Wulu
River Roah
Yirol West
River Lou (Dok/Dhok)
Awerial
Lakes
Bor
River Lotilla
Bor South
Pibor
Jonglei
River Gel-Aliab
Mvolo
Western Equatoria
Yambio
River Lesi
River Wokha (Mbolokko)
River Kohi
River Tapari
Terekeka
River Gwar
River Yapiri (Bahr el-Jebel)
Terekeka
River Ibba
Maridi
Mundri East
Juba
Lafon
Eastern Equatoria
Kapoeta N.
Ibba
Mundri West
River Yei (Rodil)
Central
Juba
River Luri
Yambio
River Sue
River Bibi
River Tori
Juba
Budi
Torit
Equatoria
River Yei (Rodil)
Lainya
Yei
River Kit
River Supri (Bahr el-Jebel)
Torit
Ikotos
Magwi
Kajo Keji
River Ateppi
Morobo
River Assua
DEMOCRATIC REPUBLIC
OF THE CONGO
UGANDA
0 20 40 60 80 100
km
N

EASTERN EQUATORIA





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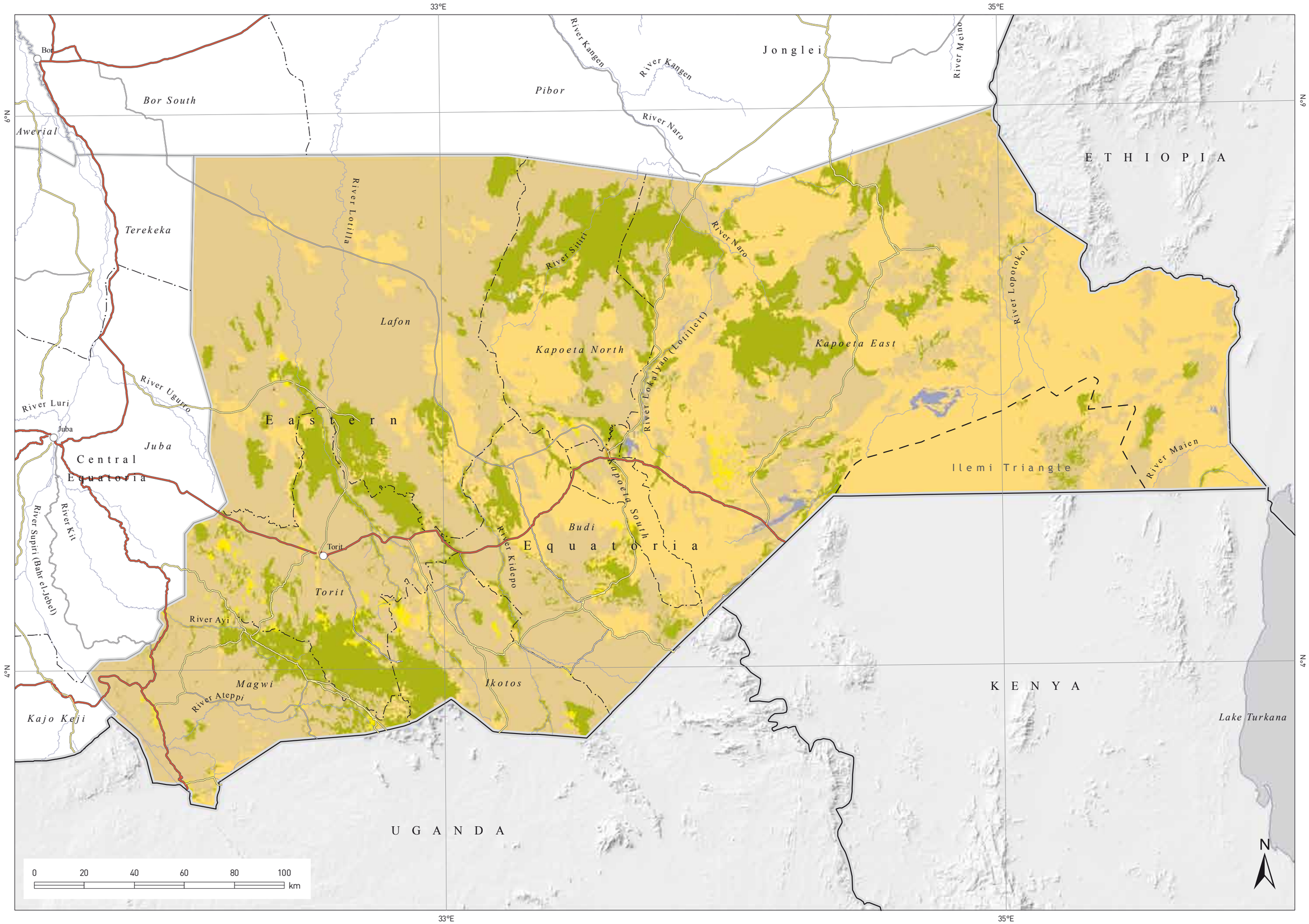
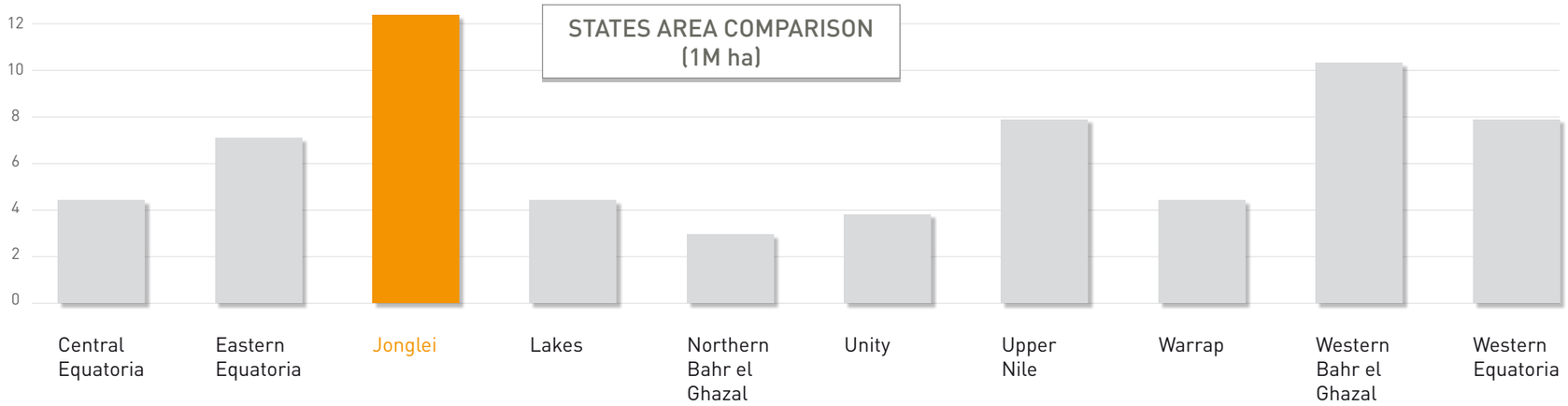
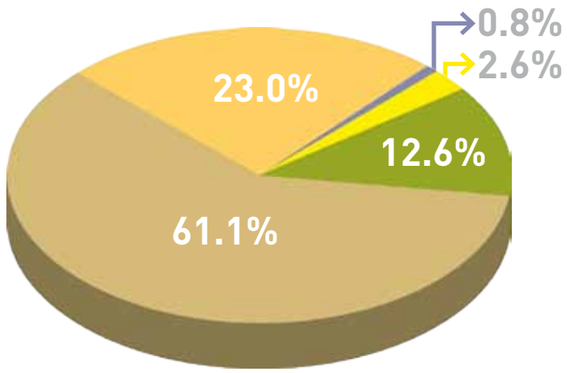
LAND COVER CLASSES IN HECTARES

COUNTY	AG Agriculture in terrestrial and aquatic/regularly flooded land	TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	URB Urban areas	BS Bare Rocks and Soil and/or Other Unconsolidated Material(s)	WAT Seasonal/ perennial, natural/artificial waterbodies	TOTAL AREA
Budi	9,232	69,810	332,339	170,854	0	175	347	582,757
Ikotos	20,671	87,865	219,978	28,362	0	38	0	356,914
Kapoeta East	13,320	350,359	1,042,190	1,627,237	0	797	18,946	3,052,849
Kapoeta North	18,718	172,465	225,217	164,696	0	1,841	237	583,174
Kapoeta South	8,227	9,049	27,234	72,992	185	0	34	117,721
Lafon	2,358	141,127	1,300,921	170,034	34	23	9,997	1,624,494
Magwi	13,809	77,890	413,693	21,890	128	0	1,286	528,696
Torit	27,135	174,059	354,432	21,286	605	0	1,415	578,932
TOTAL (ha)	**113,470**	**1,082,624**	**3,916,004**	**2,277,351**	**952**	**2,874**	**32,262**	**7,425,537**


33°E
35°E
N°9
N°7
Bor
Awerial
Bor South
Pibor
Jonglei
River Kangen
River Kangen
River Naro
River Meinu
ETHIOPIA
Terekeka
River Lotilla
River Sitiri
River Naro
Lafon
Kapoeta North
Kapoeta East
River Lokaljan (Lotilleit)
River Loporokol
River Uguro
River Luri
Juba
Juba
Central
Equatoria
Eastern
Equatoria
Ilemi Triangle
River Maien
River Kit
River Supiri (Bahr el-Jebel)
Kapoeta South
Budi
Torit
River Kidepo
Torit
River Ayi
Magwi
River Ateppi
Ikotos
Kajo Keji
KENYA
Lake Turkana
UGANDA
0 20 40 60 80 100
km
N

JONGLEI





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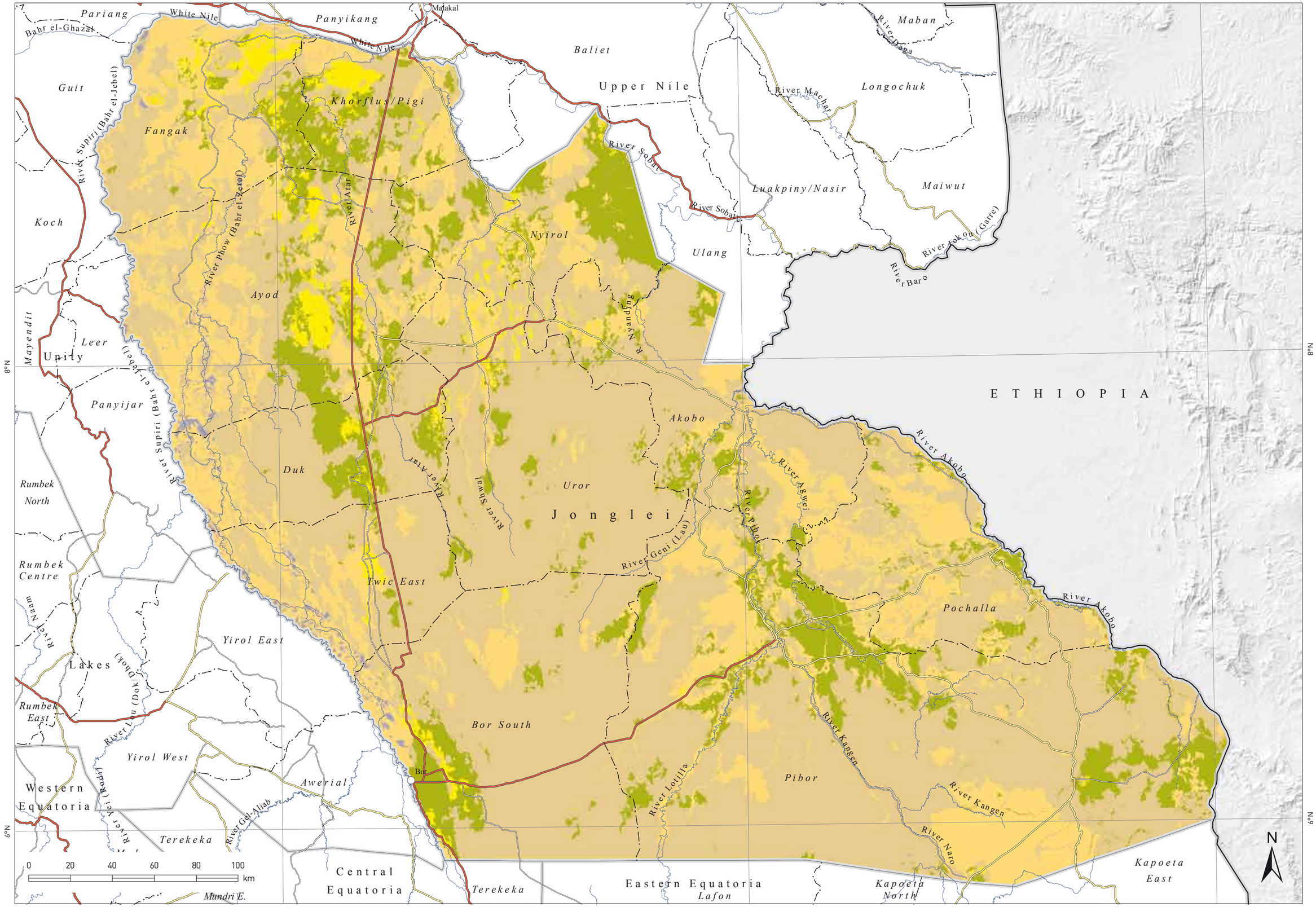
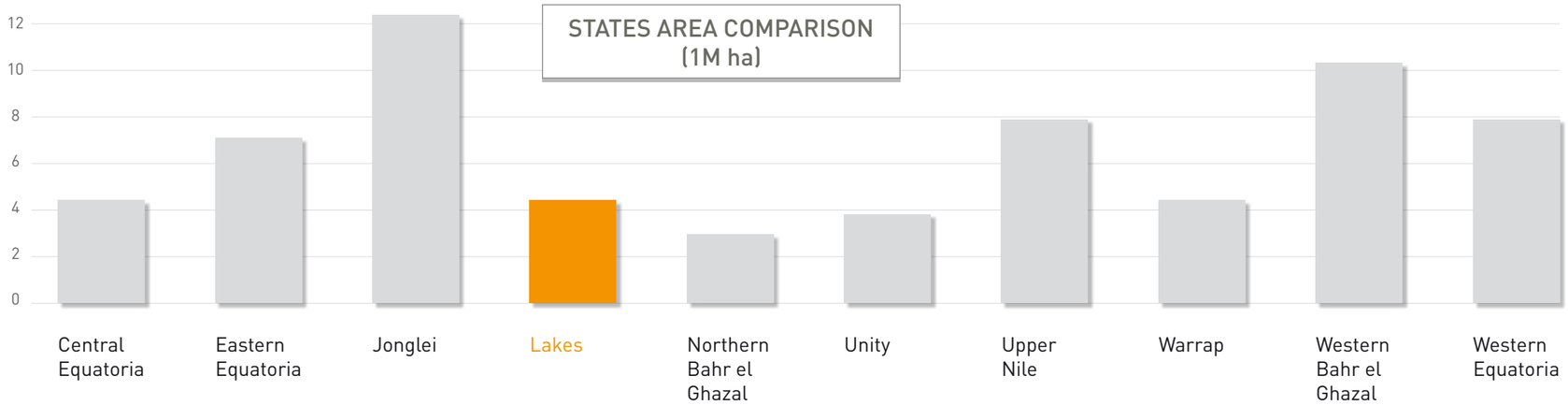
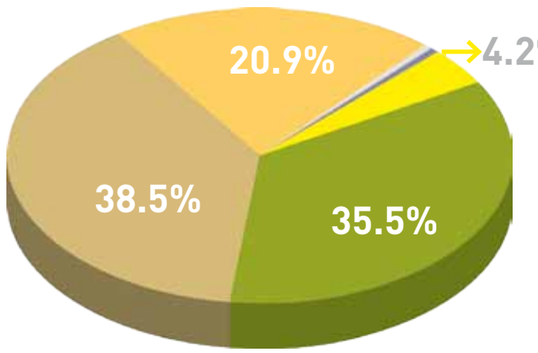
LAND COVER CLASSES IN HECTARES

COUNTY	AG Agriculture in terrestrial and aquatic/regularly flooded land	TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	URB Urban areas	BS Bare Rocks and Soil and/or Other Unconsolidated Material(s)	WAT Seasonal/ perennial, natural/artificial waterbodies	TOTAL AREA
Akobo	11,196	126,874	556,736	218,167	0	543	1,158	914,674
Ayod	59,482	175,751	590,686	479,739	228	0	45,846	1,351,732
Bor South	28,178	139,100	1,117,783	126,408	0	0	9,241	1,420,710
Duk	15,382	125,112	418,090	123,964	310	0	11,422	694,280
Fangak	64,168	69,035	303,620	317,213	46	0	9,451	763,533
Khorflus/Pigi	27,241	103,471	200,367	109,387	0	0	1,644	442,110
Nyirol	28,764	232,255	276,911	179,754	27	196	925	718,832
Pibor	23,749	423,012	2,198,687	722,944	88	0	802	3,369,282
Pochalla	41	89,681	445,993	312,455	103	125	896	849,294
Twic East	31,886	15,504	372,298	173,246	34	0	19,803	612,771
Uror	28,571	55,106	1,065,046	73,974	106	0	26	1,222,829
TOTAL (ha)	**318,658**	**1,554,901**	**7,546,217**	**2,837,251**	**942**	**864**	**101,214**	**12,360,047**


31°E
33°E
35°E
8°N
9°N
Pariang
Bahr el-Ghazal
White Nile
Panyikang
Malakal
White Nile
Baliet
Maban
River Yabus
Upper Nile
River Machar
Longochuk
Guit
River Sup iri (Bahr el-Jebel)
Khorflus/Pigi
Fangak
River Sobat
Luakpiny/Nasir
Maiwut
River Sobat
River Jokou (Garre)
River Baro
Koch
River Phow (Bahr el-Zeraf)
River Atar
Nyirol
Ulang
Ayod
Nyandi ng R
Mayendit
Leer
Unity
Panyijar
River Sup iri (Bahr el-Jebel)
Akobo
ETHIOPIA
River Akobo
Duk
River Atar
River Shwal
Uror
Jonglei
River Agwei
River Pibor
Rumbek North
River Geni (Lau)
Rumbek Centre
Twic East
River Akobo
Pochalla
River Naam
Yirol East
Lakes
River Lau (Dok)
Rumbek East
Bor South
River Kangen
Yirol West
Bor
River Lotilla
Pibor
River Kangen
Western Equatoria
River Yei (Kaji)
Awerial
River Gel-Aliab
River Naro
Terekeka
Kapoeta East
0 20 40 60 80 100 km
Central Equatoria
Terekeka
Eastern Equatoria
Lafon
Kapoeta North
Mundri E.
N
31°E
33°E
35°E

LAKES





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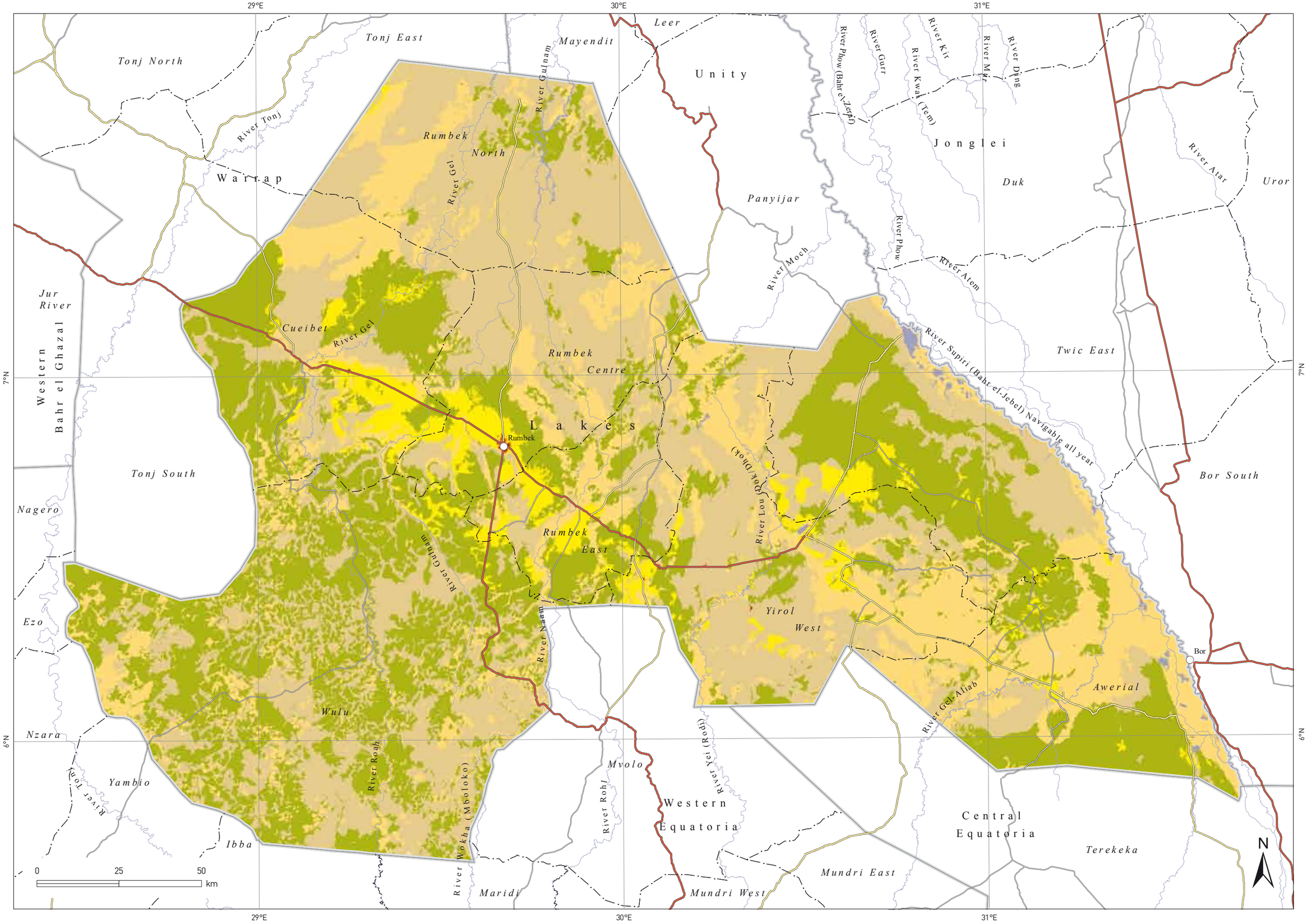
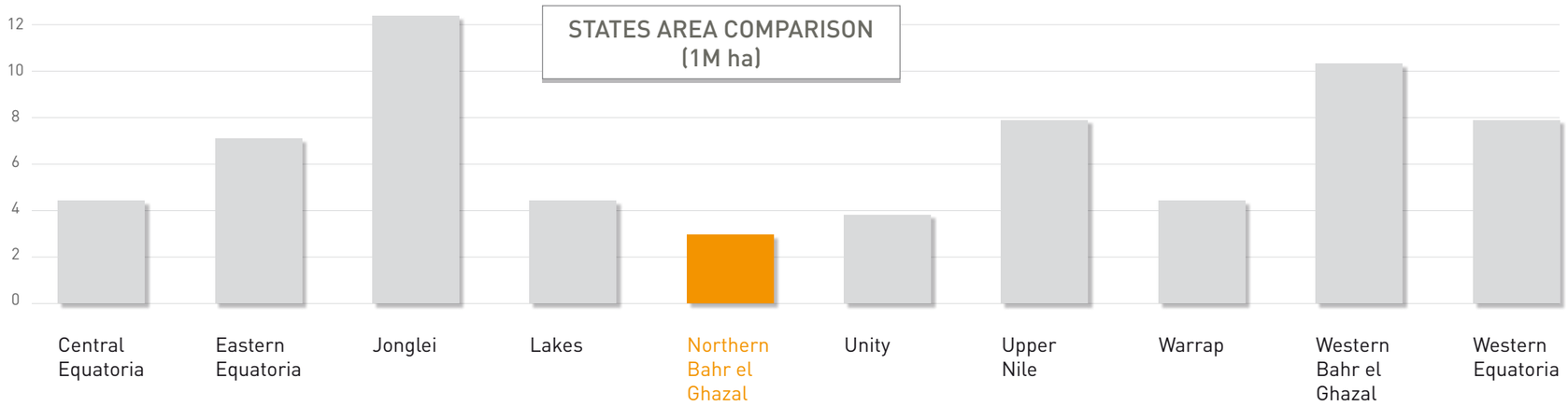
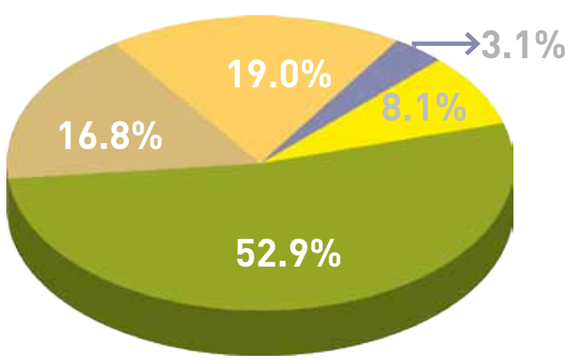
Awerial	9,749	164,868	59,557	211,016	16	1,228	4,268	450,702
Cueibet	43,680	241,530	146,553	88,630	127	0	62	520,582
Rumbek Centre	24,985	87,642	195,026	78,611	972	0	23	387,259
Rumbek East	32,216	91,919	58,983	57,575	26	0	66	240,785
Rumbek North	4,076	40,225	342,802	91,402	23	0	1,983	480,511
Wulu	11,568	604,769	388,664	157,436	43	17,010	3,600	1,183,090
Yirol East	23,726	236,593	181,198	50,599	0	0	8,134	500,250
Yirol West	34,241	96,899	325,741	185,007	559	0	1,882	644,329
TOTAL (ha)	**184,241**	**1,564,445**	**1,698,524**	**920,276**	**1,766**	**18,238**	**20,018**	**4,407,508**


29°E
30°E
31°E
7°N
6°N
Tonj North
Tonj East
Mayendit
Leer
Unity
Jonglei
Warrap
Western Bahr el Ghazal
Lakes
Rumbek North
Rumbek Centre
Rumbek East
Cueibet
Tonj South
Nagero
Ezo
Nzara
Yambio
Ibba
Wulu
Maridi
Panyijar
Duk
Uror
Twic East
Bor South
Awerial
Yirol West
Mvolo
Western Equatoria
Central Equatoria
Mundri East
Mundri West
Terekeka
Rumbek
Bor
River Tonj
River Gel
River Gulnam
River Jur
River Gel
River Gulnam
River Roah
River Nadam
River Wokha (Mboloko)
River Yei (Rodi)
River Rohl
River Lou (Rok/Dhok)
River Moch
River Phow (Bahr el-Zeraf)
River Phow
River Gurr
River Kwat (Tem)
River Atem
River Kir
River Mir
River Ding
River Atar
River Supiri (Bahr el-Jebel) Navigable all year
River Gel-Aliab
0
25
50
km
N

NORTHERN BAHR EL GHAZAL





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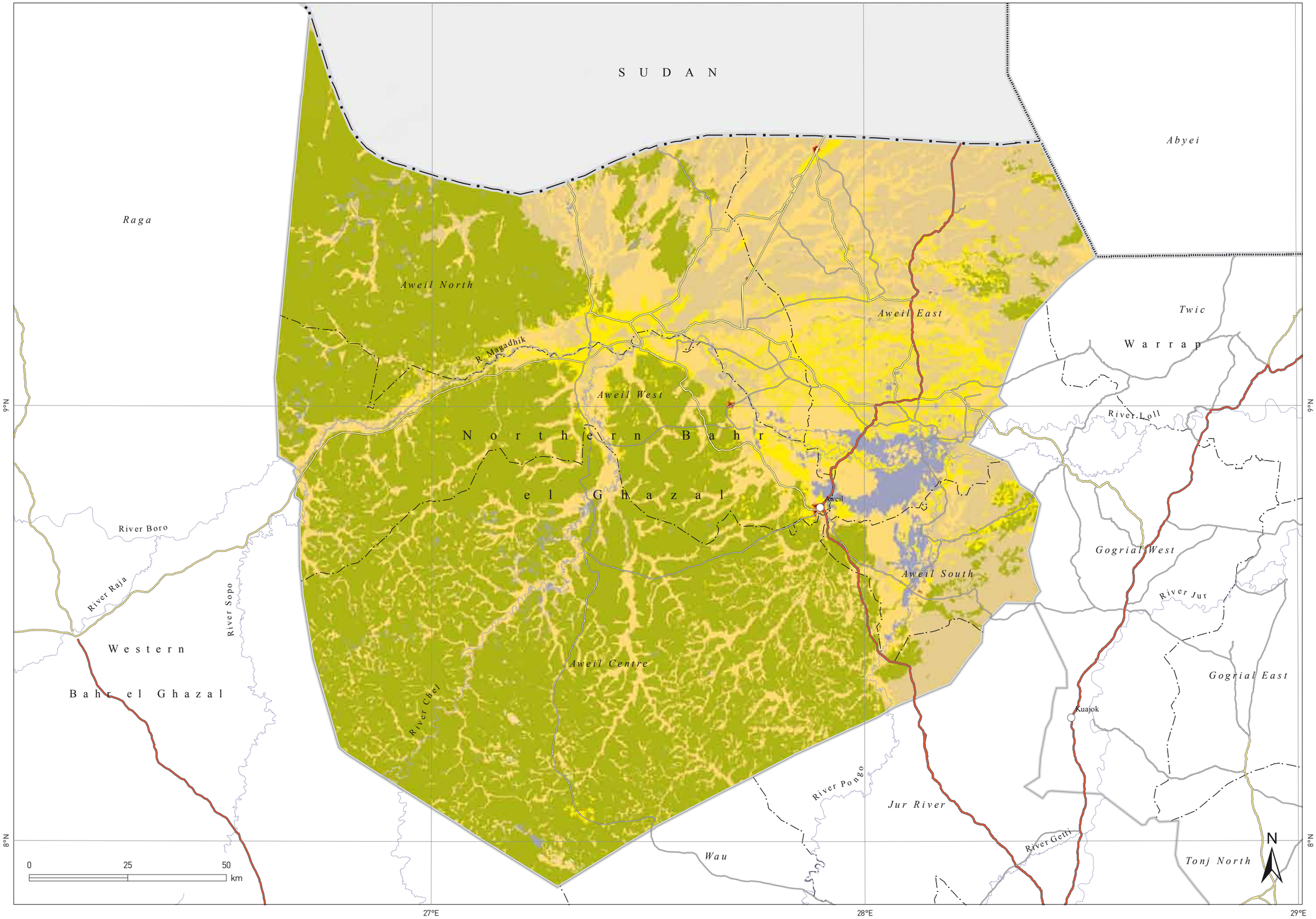
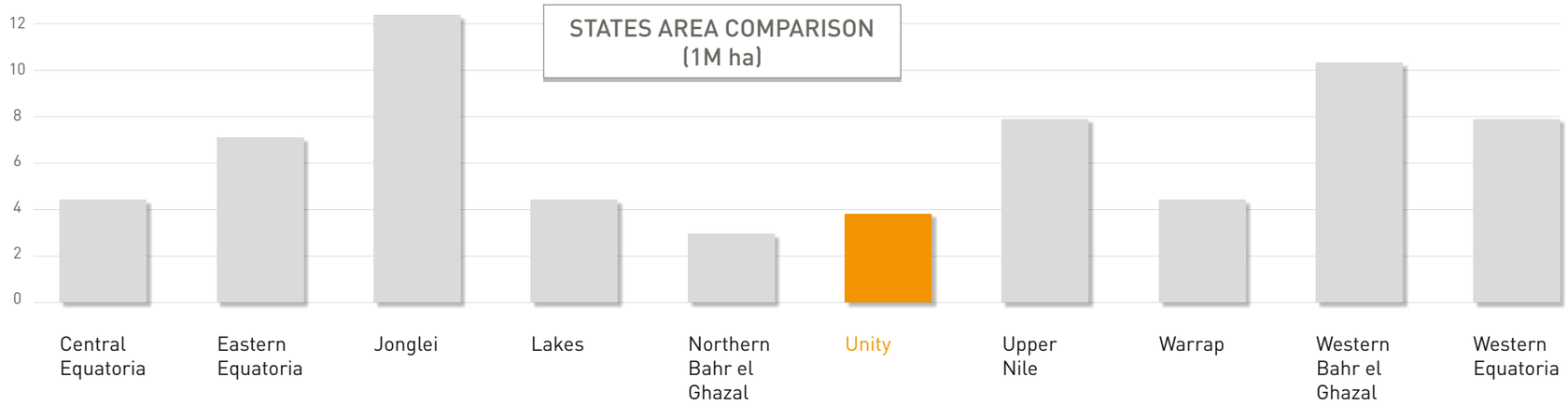
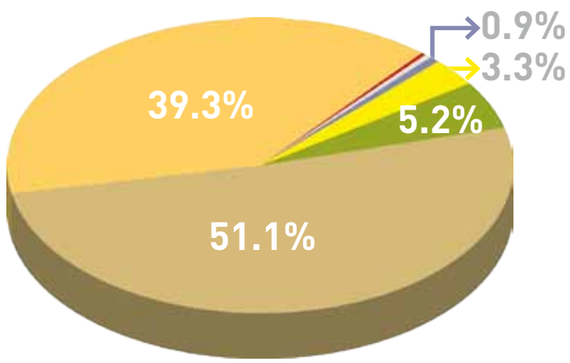
LAND COVER CLASSES IN HECTARES

COUNTY	AG Agriculture in terrestrial and aquatic/regularly flooded land	TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	URB Urban areas	BS Bare Rocks and Soil and/or Other Unconsolidated Material(s)	WAT Seasonal/ perennial, natural/artificial waterbodies	TOTAL AREA
Aweil Centre	6,758	851,944	30,304	185,767	0	1,702	18,524	1,094,999
Aweil East	125,579	17,108	278,441	125,013	266	0	46,521	592,928
Aweil North	50,834	342,756	119,441	115,597	27	0	8,529	637,184
Aweil South	21,499	35,084	55,055	34,003	47	0	8,442	154,130
Aweil West	37,488	330,480	16,884	107,511	856	62	9,357	502,638
TOTAL (ha)	**242,158**	**1,577,372**	**500,125**	**567,891**	**1,196**	**1,764**	**91,373**	**2,981,879**


27°E
28°E
29°E
9°N
8°N
SUDAN
Abyei
Raga
Aweil North
Aweil East
Twic
Warrap
R. Magadhik
Aweil West
Northern Bahr el Ghazal
River Loll
Aweil
River Boro
Gogrial West
River Raja
River Sopo
Aweil South
River Jur
Western Bahr el Ghazal
Aweil Centre
Gogrial East
Kuajok
River Chel
River Pongo
Jur River
River Gelli
Wau
Tonj North
0
25
50
km
N

UNITY





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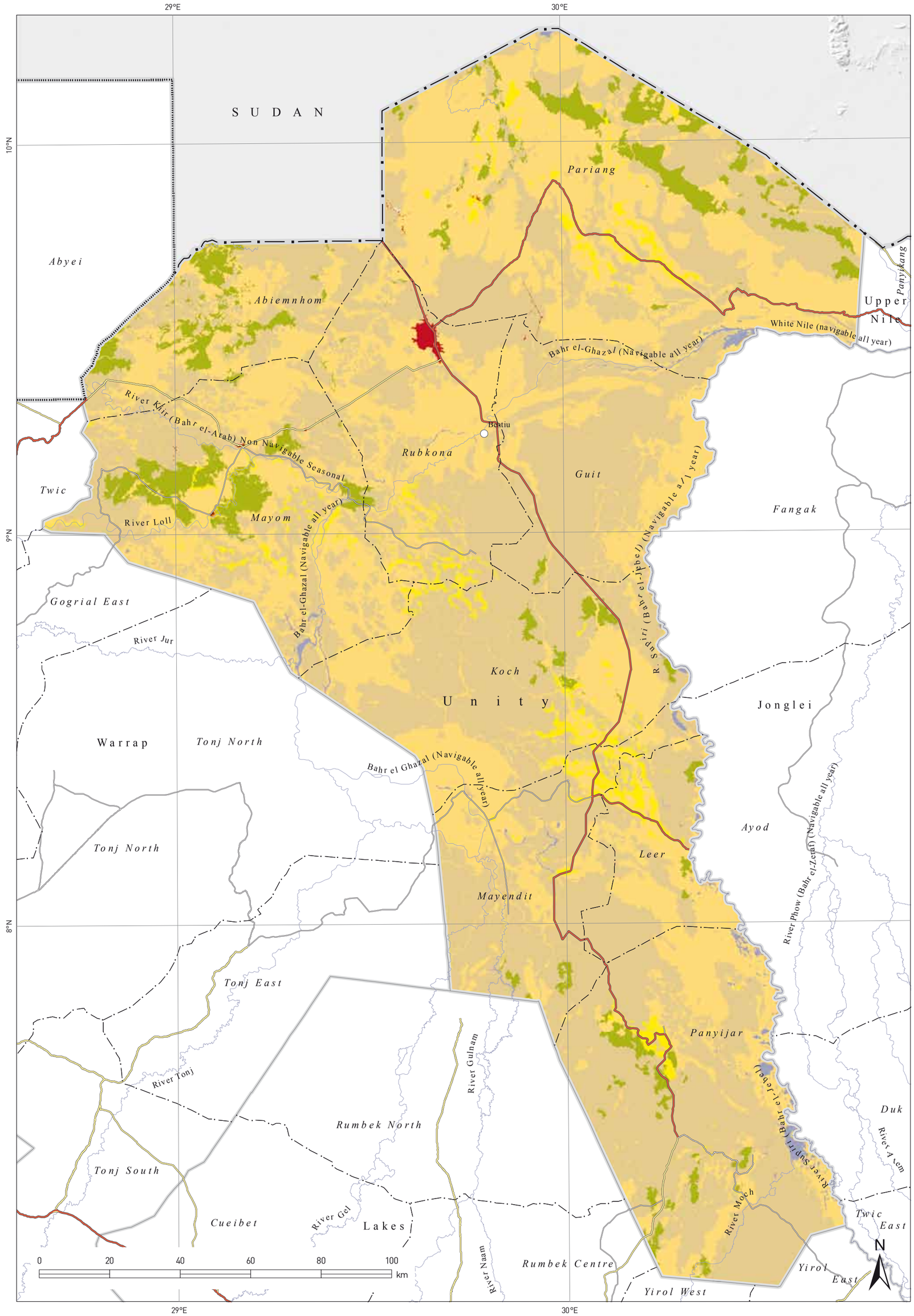
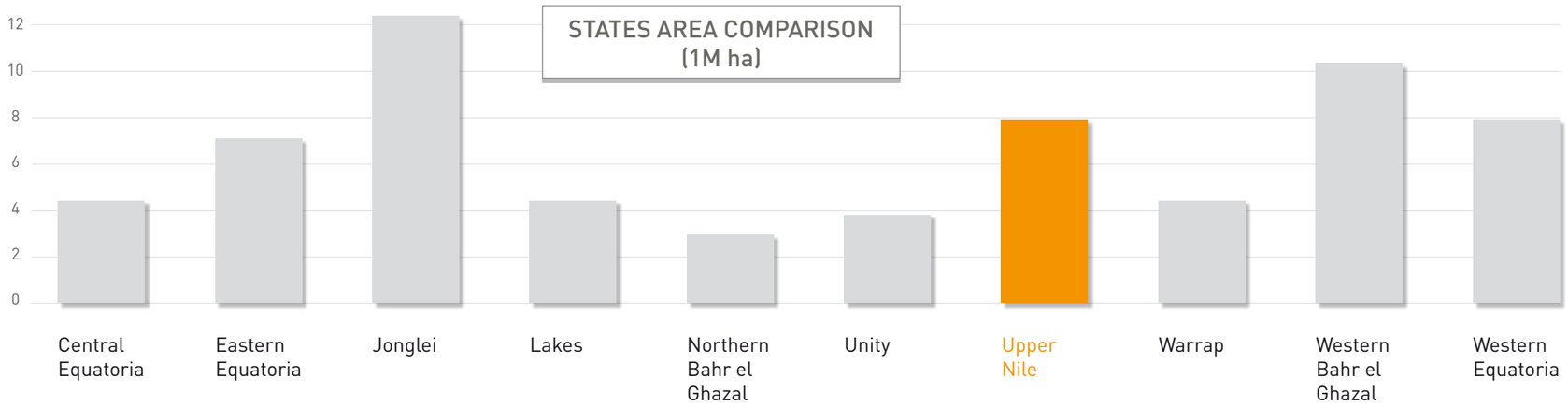
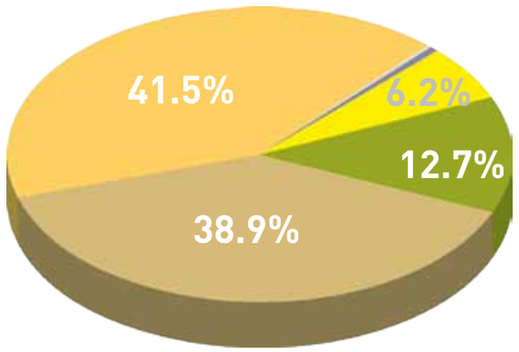
Abiemnhom	2,131	37,738	107,041	93,019	0	0	74	240,003
Guit	0	1,281	224,508	116,695	43	0	1,382	343,909
Koch	17,483	11,698	266,074	146,043	0	0	1,398	442,696
Leer	10,618	3,044	78,657	67,633	0	29	1,641	161,622
Mayendit	10,391	3,908	201,528	89,021	0	242	2,426	307,516
Mayom	32,019	46,097	194,941	224,238	444	80	3,781	501,600
Panyijar	8,811	20,143	351,812	139,800	17	0	17,092	537,675
Pariang	34,657	70,514	327,353	454,579	541	125	5,898	893,667
Rubkona	10,761	1,607	182,954	157,192	5,342	1,834	627	360,317
TOTAL (ha)	**126,871**	**196,030**	**1,934,868**	**1,488,220**	**6,387**	**2,310**	**34,319**	**3,789,005**


29°E
30°E
10°N
9°N
8°N
SUDAN
Abyei
Pariang
Abiemnhom
Panyikang
Upper Nile
White Nile (navigable all year)
Bahr el-Ghazal (Navigable all year)
River Kiir (Bahr el-Arab) Non Navigable Seasonal
Bentiu
Rubkona
Guit
Twic
River Loll
Mayom
Bahr el-Ghazal (Navigable all year)
R. Sudiri (Bahr el-Jebel) (Navigable a/l year)
Fangak
Gogrial East
River Jur
Koch
Unity
Jonglei
Warrap
Tonj North
Bahr el Ghazal (Navigable all year)
Ayod
Leer
Mayendit
River Phow (Bahr el-Zeraf) (Navigable all year)
Tonj East
Panyijar
River Tonj
River Gulnam
Rumbek North
Duk
River Awem
Tonj South
River Sudiri (Bahr el-Jebel)
River Moch
Twic East
Cueibet
River Gel
Lakes
Rumbek Centre
Yirol East
Yirol West
River Naam
0
20
40
60
80
100
km
N

UPPER NILE





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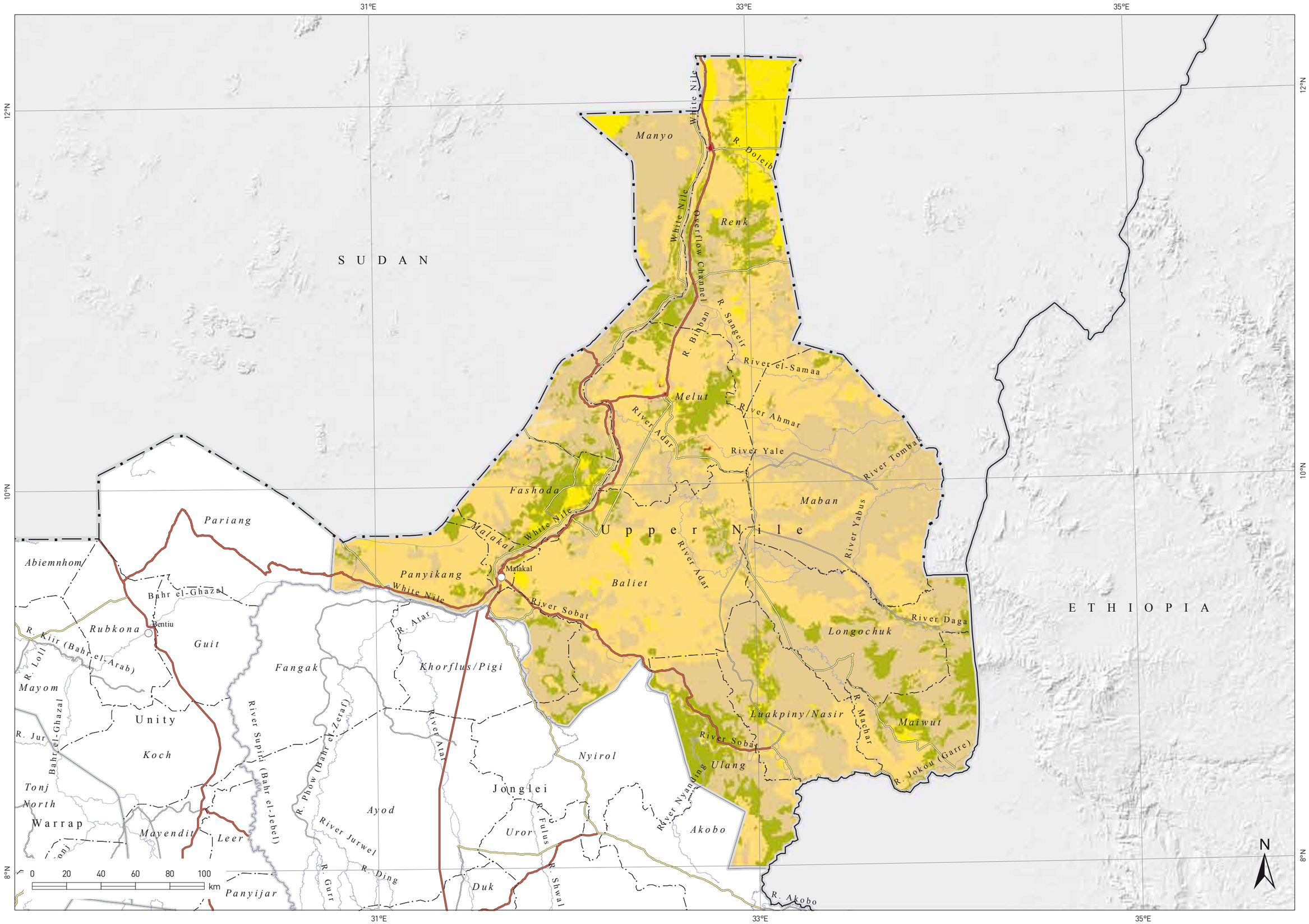
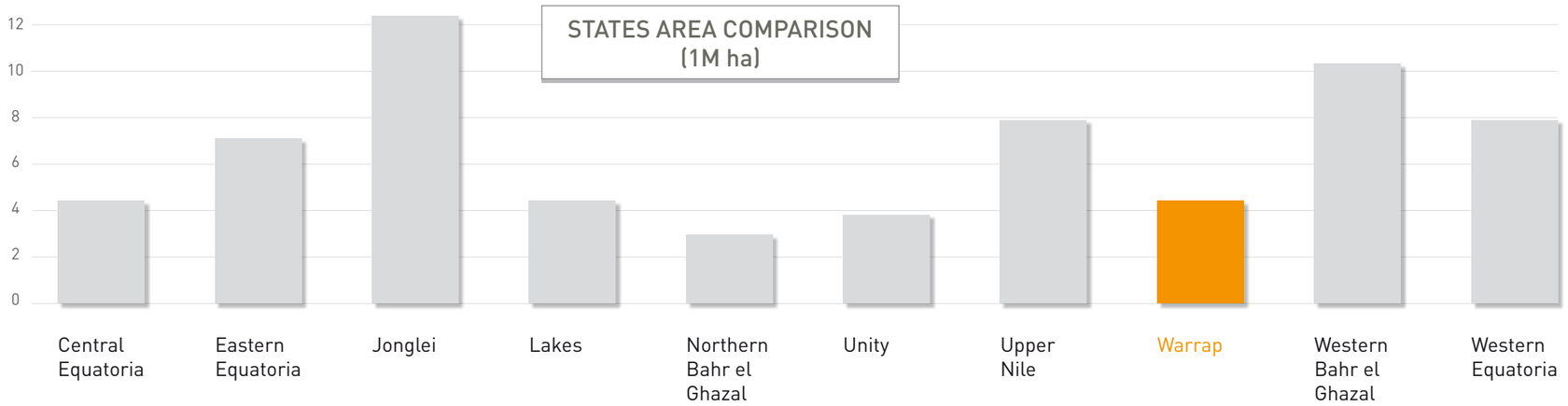
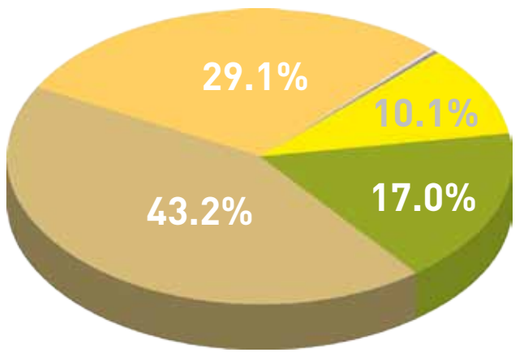
COUNTY	AG Agriculture in terrestrial and aquatic/regularly flooded land	TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	URB Urban areas	BS Bare Rocks and Soil and/or Other Unconsolidated Material(s)	WAT Seasonal/ perennial, natural/artificial waterbodies	TOTAL AREA
Baliet	39,169	74,276	259,544	801,428	586	0	3,227	1,178,230
Fashoda	37,368	102,323	70,317	140,993	0	4,747	2,038	357,786
Longochuk	7,192	85,895	439,381	172,974	0	0	0	705,442
Luakpiny/Nasir	28,621	50,386	322,109	121,192	0	0	1,411	523,719
Maban	18,879	18,087	691,687	472,183	365	0	228	1,201,429
Maiwut	15,544	102,243	197,532	80,832	0	0	143	396,294
Malakal	5,739	9,716	5,019	51,785	1,145	0	1,677	75,081
Manyo	32,305	69,721	404,555	151,338	0	6,626	8,108	672,653
Melut	16,021	107,734	132,610	436,211	3,686	0	4,670	700,932
Panyikang	9,963	50,702	149,006	307,743	0	0	4,401	521,815
Renk	263,616	153,321	193,126	392,690	2,072	1,717	5,592	1,012,134
Ulang	11,416	174,062	181,026	119,739	0	90	2,865	489,198
TOTAL (ha)	**485,833**	**998,466**	**3,045,912**	**3,249,108**	**7,854**	**13,180**	**34,360**	**7,834,713**


31°E
33°E
35°E
12°N
10°N
8°N
SUDAN
ETHIOPIA
Upper Nile
Manyo
Renk
Maban
Fashoda
Baliet
Panyikang
Malakal
Pariang
Abiemnhom
Rubkona
Bentiu
Guit
Mayom
Unity
Koch
Tonj North
Warrap
Mayendit
Leer
Fangak
Khorflus/Pigi
Ayod
Duk
Jonglei
Nyirol
Uror
Akobo
Longochuk
Luakpiny/Nasir
Maiwut
Ulang
Panyijar
White Nile
Overflow Channel
R. Doleib
R. Bihban
R. Sangeir
River el-Samaa
River Ahmar
River Yale
River Tombak
River Adar
River Yabus
River Sobat
River Daga
R. Atar
R. Kiir (Bahr el-Arab)
R. Lol
R. Jur
Bahr el-Ghazal
River Supid (Bahr el-Jebel)
R. Phow (Bahr el-Zeraf)
River Jurwel
R. Gurr
R. Ding
R. Fulus
R. Shwal
River Nyanding
R. Machar
R. Jokou (Garre)
R. Akobo
0 20 40 60 80 100 km
N
No.01
No.8

WARRAP



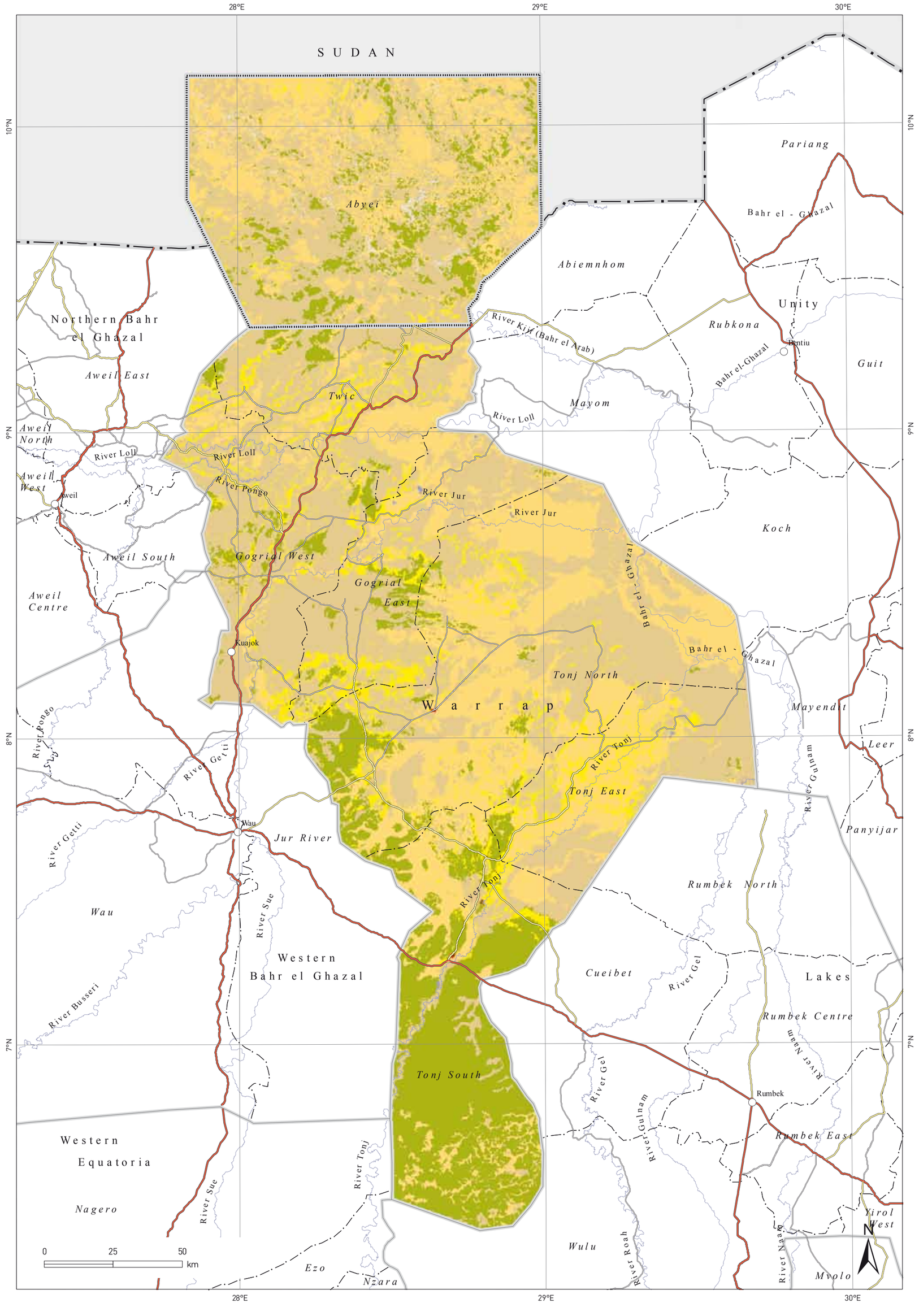


Note: Only classes representing more than 0.5 % of the area are shown in the chart

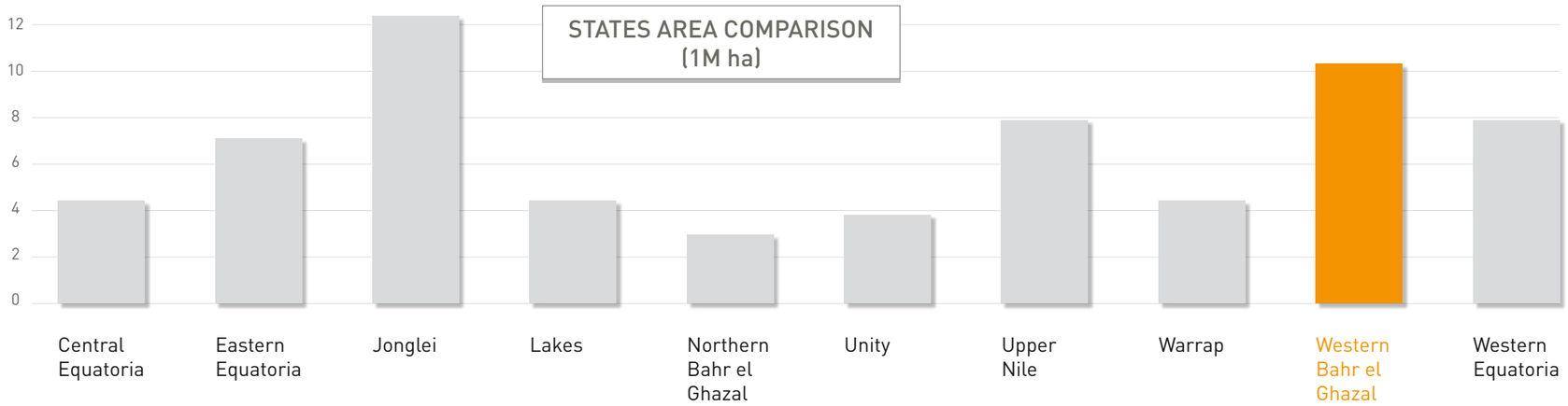
INDEX MAP

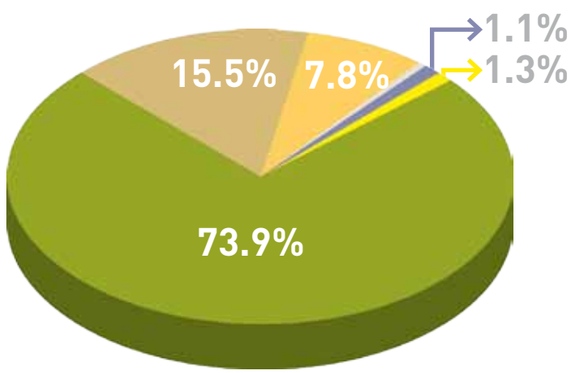
LAND COVER CLASSES IN HECTARES

COUNTY	AG Agriculture in terrestrial and aquatic/regularly flooded land	TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	URB Urban areas	BS Bare Rocks and Soil and/or Other Unconsolidated Material(s)	WAT Seasonal/ perennial, natural/artificial waterbodies	TOTAL AREA
Abyei	16,088	133,555	525,008	360,240	0	14,138	103	1,049,132
Gogrial East	90,626	28,605	173,749	91,001	282	0	1,403	385,666
Gogrial West	82,871	40,991	302,625	50,844	0	0	3,044	480,375
Tonj East	65,068	7,571	174,873	123,964	0	0	627	372,103
Tonj North	108,068	90,397	429,108	459,091	323	13	1,644	1,088,644
Tonj South	29,976	431,993	87,410	120,604	807	1,029	1,148	672,967
Twic	55,702	21,518	229,768	89,289	0	0	167	396,444
TOTAL (ha)	**448,399**	**754,630**	**1,922,541**	**1,295,033**	**1,412**	**15,180**	**8,136**	**4,445,331**


28°E
29°E
30°E
10°N
9°N
8°N
7°N
SUDAN
Abyei
Pariang
Bahr el - Ghazal
Abiemnhom
Unity
Rubkona
Guit
Pentiu
Bahr el-Ghazal
River Kiir (Bahr el Arab)
Northern Bahr el Ghazal
Aweil East
Twic
Mayom
River Loll
Aweil North
Aweil West
Aweil
River Pongo
River Jur
Koch
Aweil South
Gogrial West
Gogrial East
Aweil Centre
Kuajok
Warrap
Tonj North
Mayendit
Leer
River Tonj
Tonj East
River Gulnam
Panyijar
River Getti
Wau
Jur River
Rumbek North
River Sue
Western Bahr el Ghazal
Cueibet
River Gel
Lakes
Rumbek Centre
River Naam
Tonj South
Rumbek
Rumbek East
Western Equatoria
Nagero
Xirol West
Wulu
River Roah
Ezo
Nzara
Mvolo
0
25
50
km
N

WESTERN BAHR EL GHAZAL





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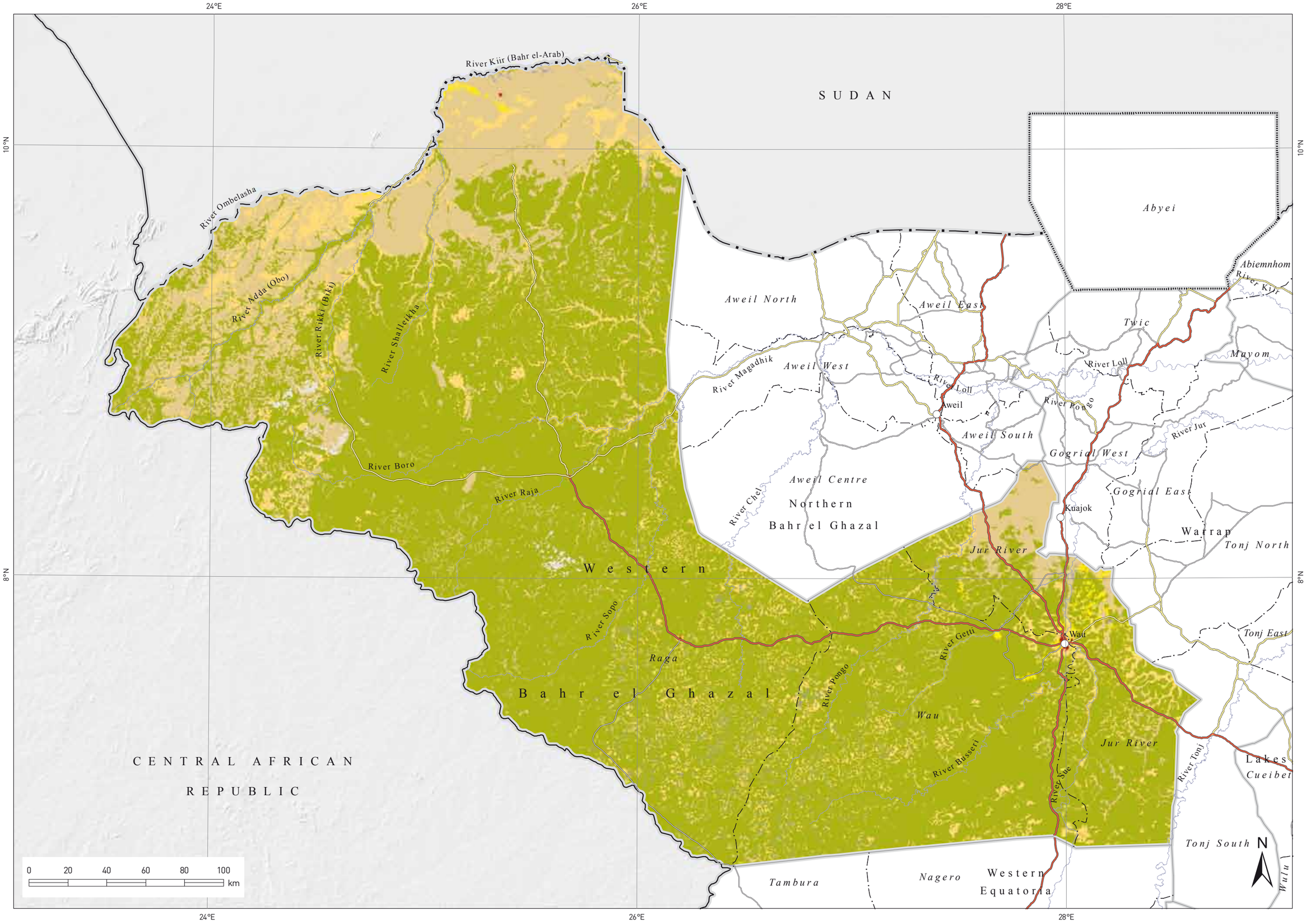
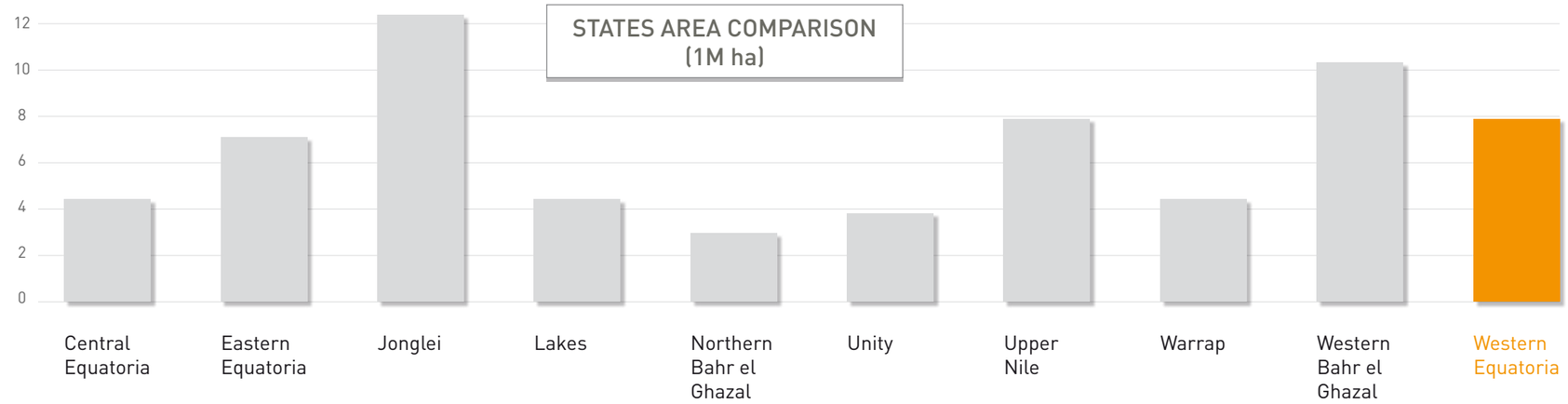
INDEX MAP

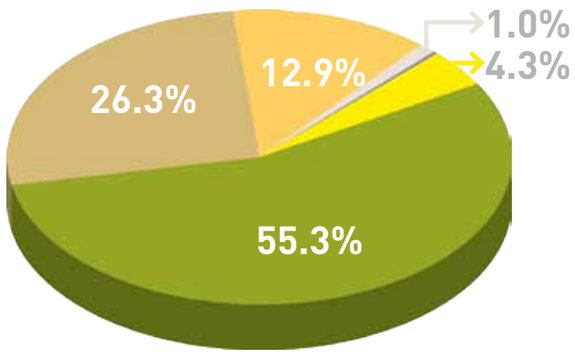
LAND COVER CLASSES IN HECTARES

COUNTY	AG Agriculture in terrestrial and aquatic/regularly flooded land	TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	URB Urban areas	BS Bare Rocks and Soil and/or Other Unconsolidated Material(s)	WAT Seasonal/ perennial, natural/artificial waterbodies	TOTAL AREA
Jur River	91,067	736,536	173,600	105,110	424	119	4,299	1,111,155
Raga	23,113	5,212,768	1,410,073	555,885	806	32,956	70,083	7,305,684
Wau	20,565	1,694,366	23,569	142,227	2,295	3,041	37,864	1,923,927
TOTAL (ha)	**134,745**	**7,643,670**	**1,607,242**	**803,222**	**3,525**	**36,116**	**112,246**	**10,340,766**


24°E
26°E
28°E
10°N
8°N
SUDAN
CENTRAL AFRICAN
REPUBLIC
River Kiir (Bahr el-Arab)
Rivet Ombelasha
River Adda (Obo)
River Rikki (Biki)
River Shalleikha
River Boro
River Raja
River Sopo
River Magadhik
River Chel
River Pongo
River Getti
River Bussert
River Sue
River Loll
River Jur
River Tonj
Western
Bahr el Ghazal
Northern
Bahr el Ghazal
Western
Equatoria
Abyei
Aweil North
Aweil East
Aweil West
Aweil South
Aweil Centre
Raga
Wau
Jur River
Twic
Abiemnhom
Muyom
Gogrial West
Gogrial East
Warrap
Tonj North
Tonj East
Tonj South
Lakes
Cueibet
Wulu
Tambura
Nagero
Aweil
Kuajok
Wau
0 20 40 60 80 100
km
N

WESTERN EQUATORIA



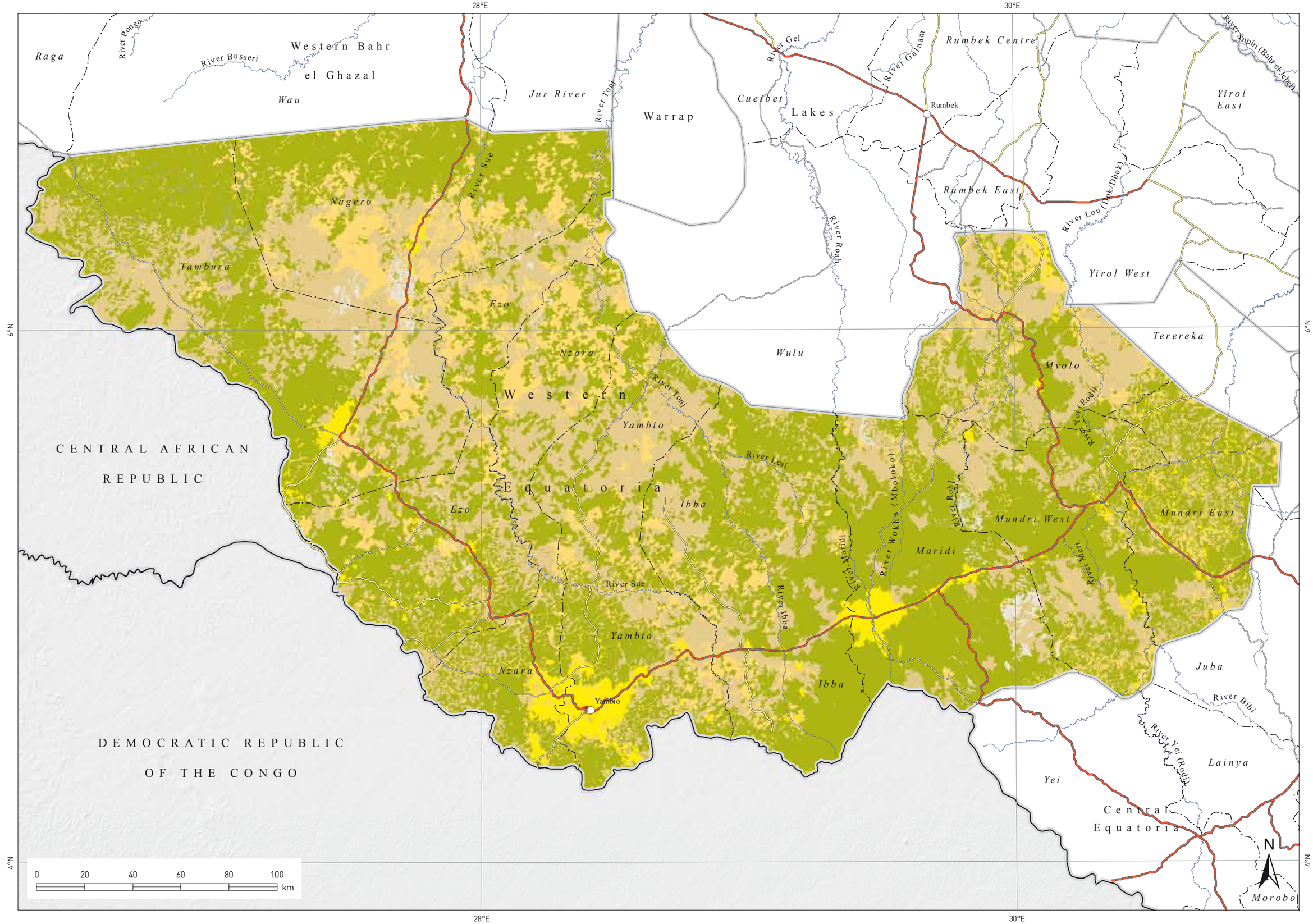


Note: Only classes representing more than 0.5 % of the area are shown in the chart

INDEX MAP

LAND COVER CLASSES IN HECTARES

COUNTY	AG Agriculture in terrestrial and aquatic/regularly flooded land	TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	URB Urban areas	BS Bare Rocks and Soil and/or Other Unconsolidated Material(s)	WAT Seasonal/ perennial, natural/artificial waterbodies	TOTAL AREA
Ezo	26,438	420,328	211,405	139,807	0	6,037	968	804,983
Ibba	23,823	629,515	214,701	107,656	0	2,538	540	978,773
Maridi	51,287	532,322	138,457	22,475	47	28,942	22	773,552
Mundri East	36,776	294,623	100,631	43,902	423	727	717	477,799
Mundri West	37,956	373,729	133,975	30,381	68	7,918	1,179	585,206
Mvolo	20,907	223,520	233,746	93,528	393	3,303	711	576,108
Nagero	4,907	479,726	219,945	203,802	0	13,316	4,554	926,250
Nzara	38,206	294,802	169,447	141,200	106	2,033	570	646,364
Tambura	36,398	706,885	407,679	85,047	62	13,839	8,297	1,258,207
Yambio	64,834	418,155	247,606	153,266	658	60	145	884,724
TOTAL (ha)	**341,532**	**4,373,605**	**2,077,592**	**1,021,064**	**1,757**	**78,713**	**17,703**	**7,911,966**


28°E
30°E
6°N
4°N
Raga
River Pongo
River Busseri
Western Bahr el Ghazal
Wau
Jur River
River Toni
Warrap
River Gel
River Gu/nam
Cuebet Lakes
Rumbek Centre
Rumbek
River Supiri (Bahr el Jebel)
Yirol East
Nagero
River Sue
Tambura
Ezo
Rumbek East
River Lou (Dok/Dhok)
Yirol West
River Roah
Wulu
Terereka
Nzara
Mvolo
River Toni
River Yei (Rodi)
Western Equatoria
Yambio
River Lesi
River Wokha (Mbolioko)
River Rob
Mundri West
Mundri East
River Maridi
Maridi
River Mieri
Ibba
River Sue
River Ibba
Juba
River Bibi
River Yei (Rodi)
Lainya
Yei
Central Equatoria
Morobo
CENTRAL AFRICAN REPUBLIC
DEMOCRATIC REPUBLIC OF THE CONGO
0 20 40 60 80 100 km
N

Land cover by:

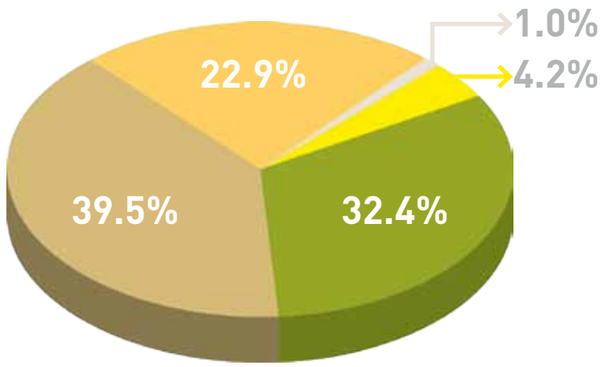
SUB-BASIN

A hydrological basin can be defined as the extent of land from which surface water originating from precipitation, channelled in rivers and streams, drains down stream in a single point towards another waterbody such as river, lake, sea or ocean or wetland. A closed hydrological basin may drain also into a sink like a salt pan or a point where the surface water is lost underground. The hydrological basin includes also the streams and the rivers that convey the water as well as the land surfaces from which water drains into those channels and it is separated from adjacent basins by a "drainage divide" or "watershed". Hydrological basins drain into other hydrological basins and many small hydrological sub-basins form together larger river basins. Hydrological basins are the reference unit to study surface water movements within the hydrological cycle.

The South Sudan hydrological basins come from the HydroSHEDS (Hydrological data and maps based on SHuttle Elevation Derivatives at multiple Scales) of the US Geological Survey. The USGS HydroSHEDS is based on high-resolution elevation data obtained during a Space Shuttle flight of NASA's Shuttle Radar Topography Mission (SRTM).

Around twenty four sub-basins fall in the South Sudan area, including five sub-basins of which only a small portion is comprised. They are part of two main hydrological basins: the biggest part of the study area belongs to the Nile basin, while the eastern part of the area belongs to the Rift Valley basin. The delineation of the hydrological basins can be considered as the starting point in the analysis of the hydrological cycle to study surface water resources systems.

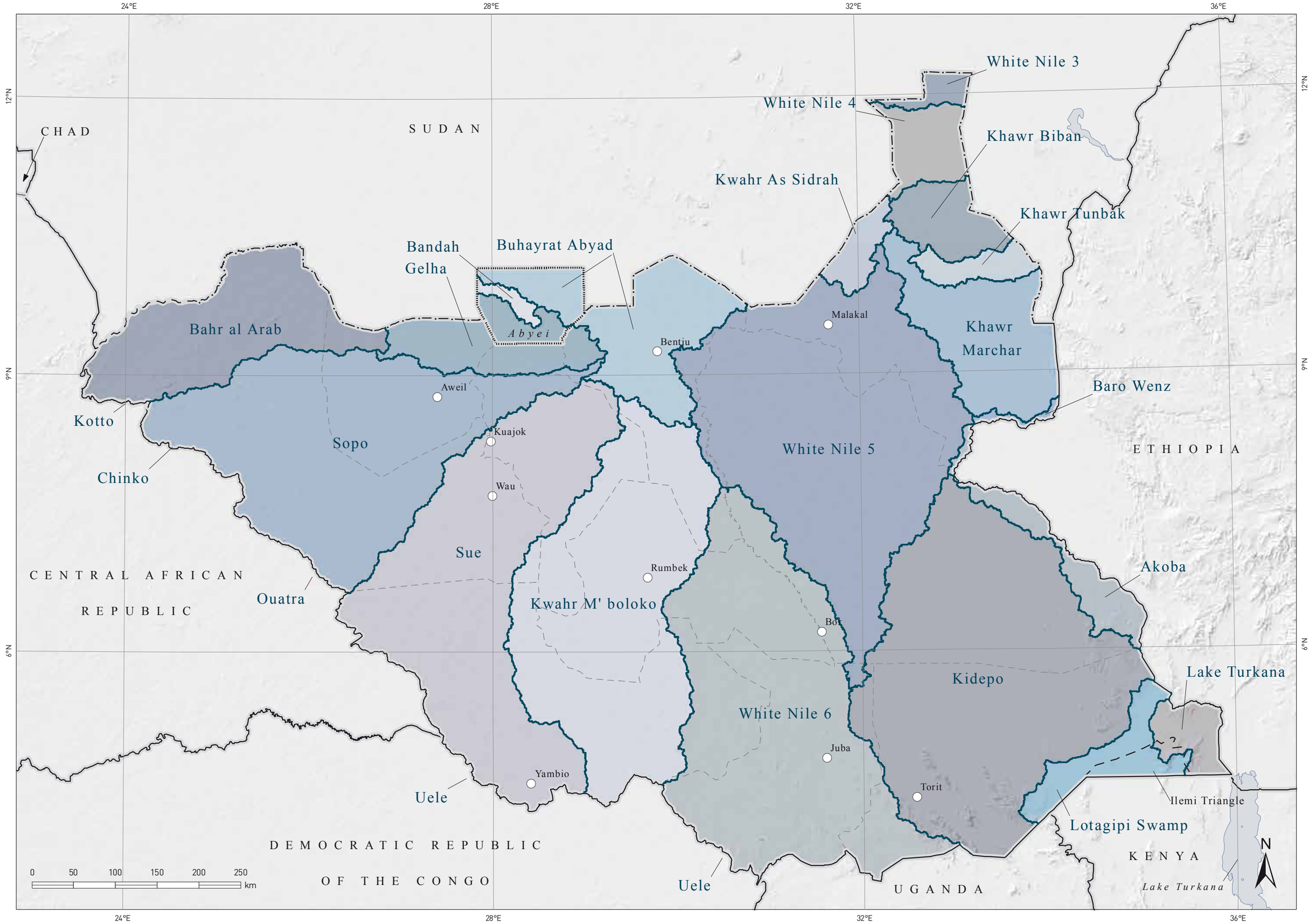
SOUTH SUDAN SUB-BASINS



Note: Only classes representing more than 0.5 % of the area are shown in the chart

LAND COVER CLASSES IN HECTARES

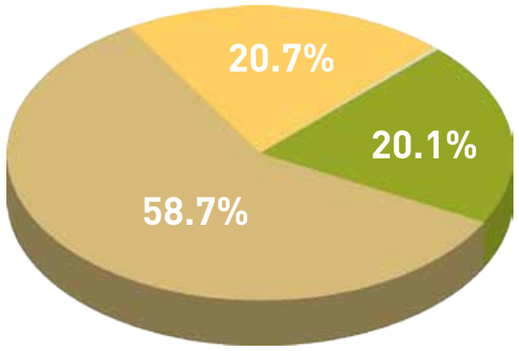
SUB-BASIN	AG Agriculture in terrestrial and aquatic/regularly flooded land	TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/ artificial waterbodies	TOTAL AREA
Akoba	1,835	189,574	552,855	195,228	2,140	941,633
Bahr al Arab	15,835	1,738,023	1,241,163	370,096	32,379	3,397,496
Bandah	0	16,060	78,415	54,369	3,913	152,757
Baro Wenz	198	4,771	61,519	29,536	633	96,657
Buhayrat Abyad	85,240	180,075	1,180,206	1,111,106	20,494	2,577,121
Chinko	0	15,870	169	171	99	16,309
Gelha	170,034	178,199	863,761	368,851	22,167	1,603,013
Khawr Biban	40,048	124,679	194,413	575,282	4,840	939,262
Khawr Marchar	43,189	260,614	1,294,629	842,080	2,511	2,443,022
Khawr Tunbak	626	16,399	276,589	176,351	1,449	471,414
Kidepo	103,565	1,316,933	5,895,131	2,227,652	21,099	9,564,380
Kotto	0	8,684	1,433	274	23	10,414
Kwahr As Sidrah	13,516	91,417	181,461	151,396	16,516	454,305
Kwahr M' boloko	273,032	3,197,997	2,631,094	1,327,288	71,428	7,500,839
Lake Turkana	0	21,079	152,864	426,319	901	601,163
Lotagipi Swamp	9,191	57,557	273,096	627,715	14,683	982,242
Ouatra	444	18,585	4,104	1,515	336	24,983
Sopo	227,361	5,609,158	670,752	778,638	173,191	7,459,100
Sue	529,813	3,907,604	1,868,303	1,297,830	78,774	7,682,324
Uele	5,192	29,774	7,973	3,854	150	46,942
White Nile 3	139,436	19,055	46,616	58,676	3,986	267,770
White Nile 4	141,341	135,543	314,598	232,360	7,861	831,703
White Nile 5	373,863	1,193,273	4,943,404	2,695,013	80,599	9,286,152
White Nile 6	603,467	2,994,750	3,304,616	1,516,394	117,089	8,536,316
TOTAL	**2,777,226**	**21,325,672**	**26,039,163**	**15,067,995**	**677,260**	**65,887,317**


24°E
28°E
32°E
36°E
12°N
9°N
6°N
CHAD
SUDAN
CENTRAL AFRICAN REPUBLIC
DEMOCRATIC REPUBLIC OF THE CONGO
UGANDA
KENYA
ETHIOPIA
White Nile 3
White Nile 4
Khawr Biban
Kwahr As Sidrah
Khawr Tunbak
Bandah
Gelha
Buhayrat Abyad
Abyei
Bahr al Arab
Malakal
Bentiu
Khawr Marchar
Baro Wenz
Aweil
Kotto
Kuajok
Sopo
Chinko
White Nile 5
Wau
Sue
Rumbek
Akoba
Ouatra
Kwahr M' boloko
Bor
Kidepo
Lake Turkana
White Nile 6
Juba
Yambio
Torit
Uele
Ilemi Triangle
Lotagipi Swamp
Uele
Lake Turkana
0 50 100 150 200 250 km
N

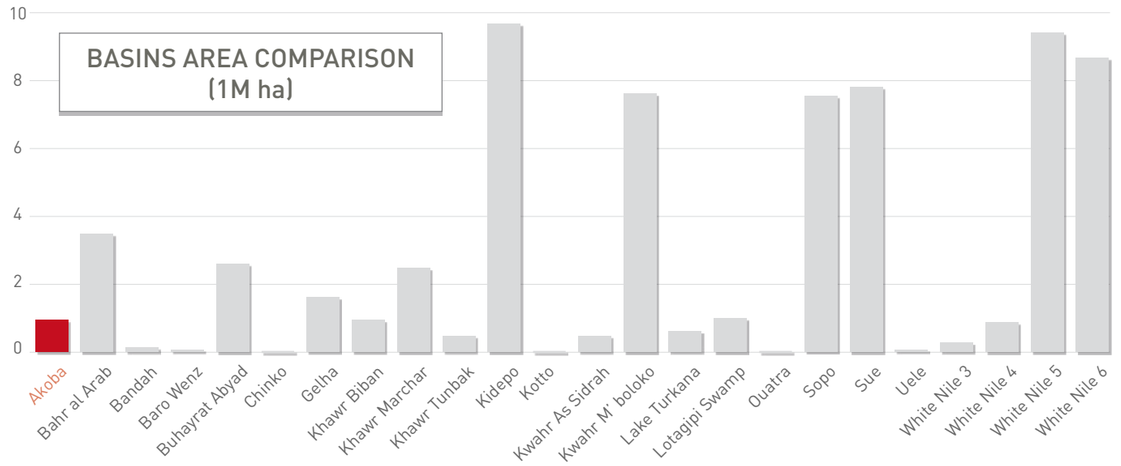
AKOBA

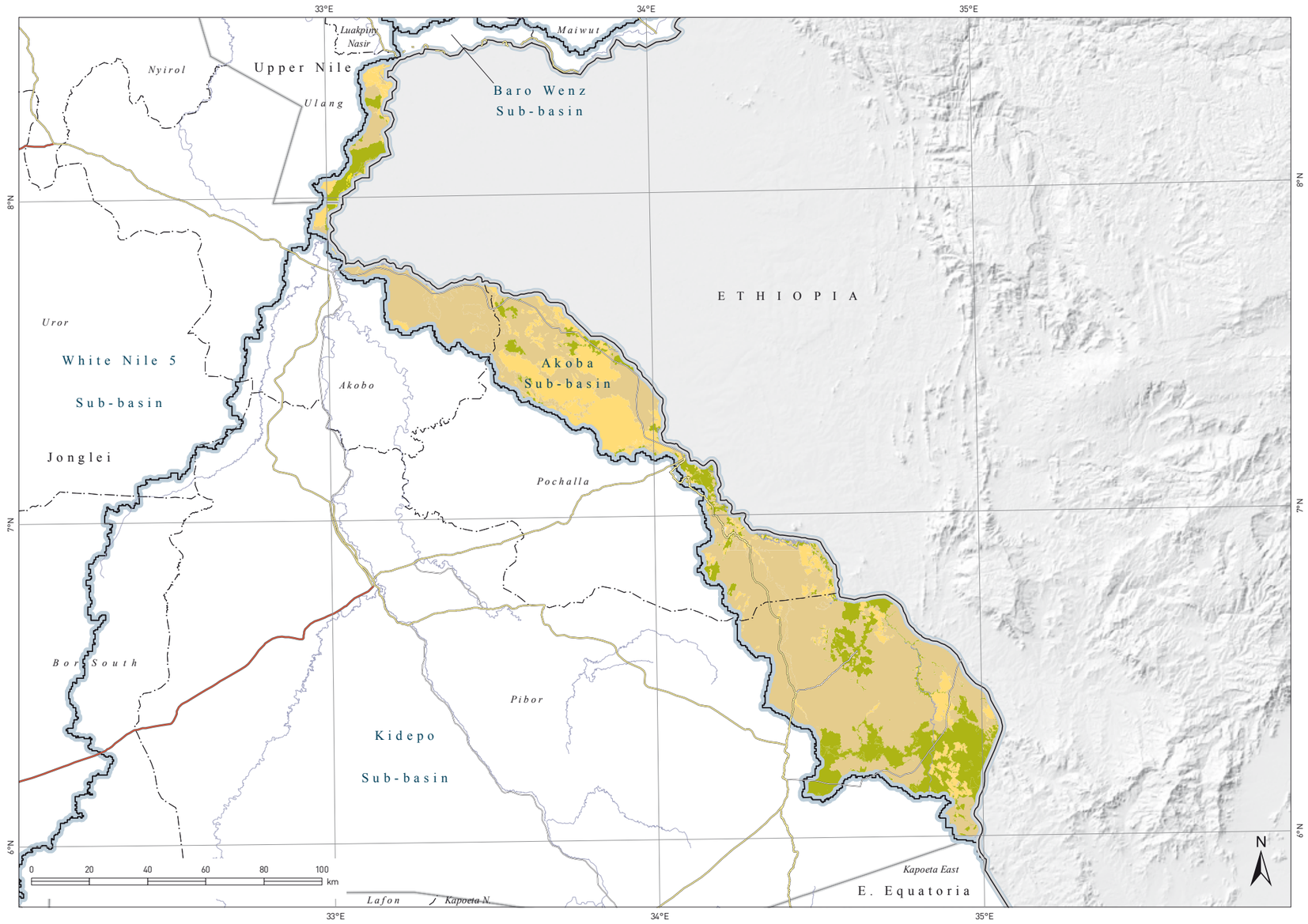
LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	1,835
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	189,574
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	552,855
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	195,228
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	2,140
TOTAL AREA	941,633

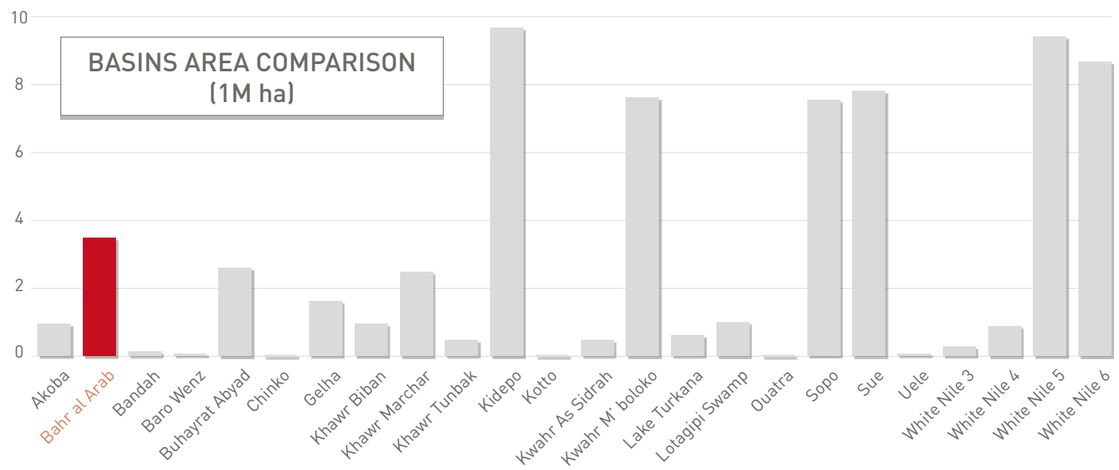


Note: Only classes representing more than 0.5 % of the area are shown in the chart





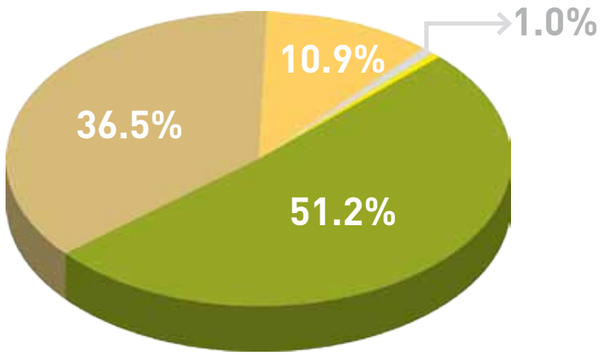
INDEX MAP



BAHR AL ARAB

LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	15,835
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	1,738,023
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	1,241,163
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	370,096
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	32,379
TOTAL AREA	3,397,496



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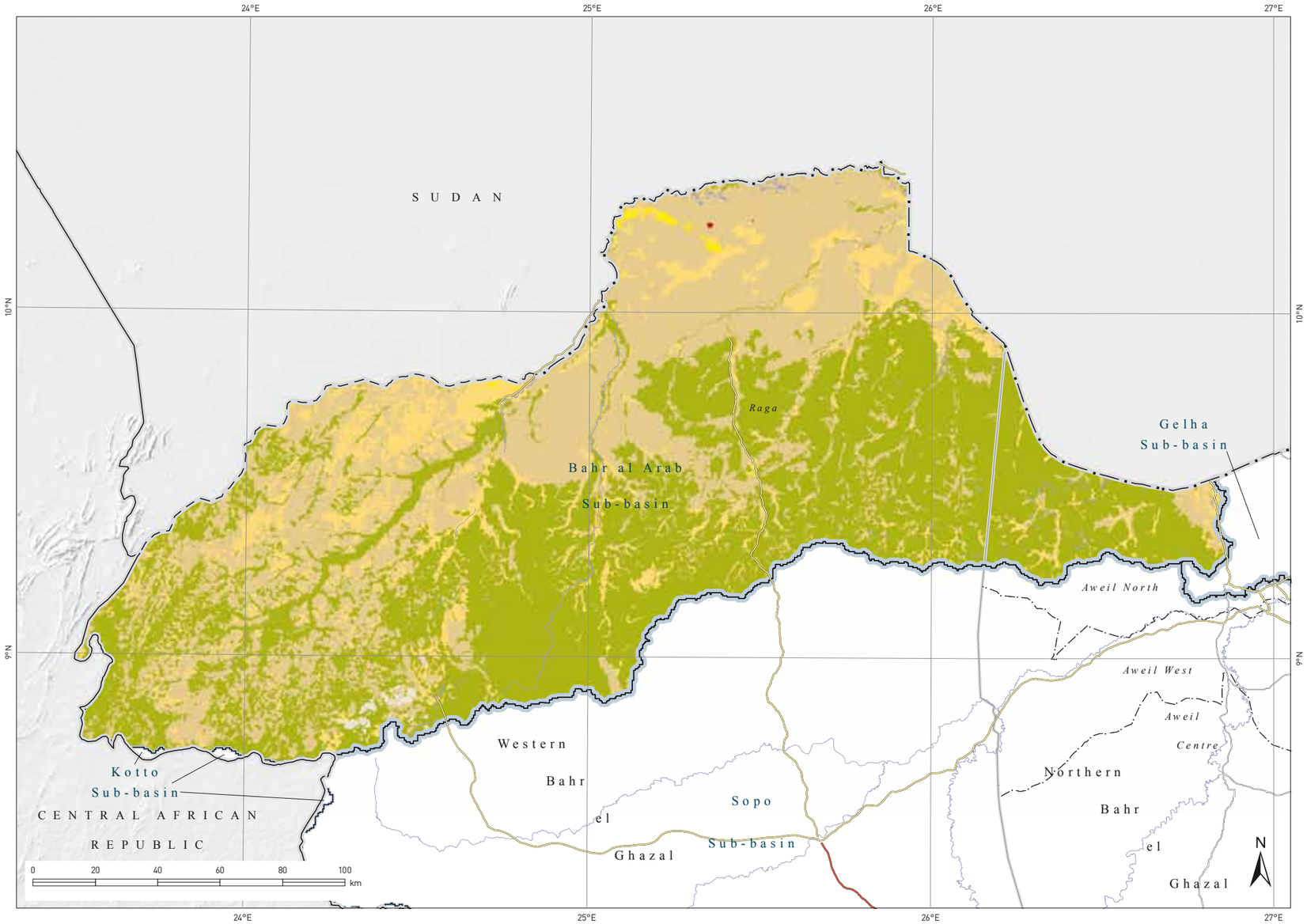
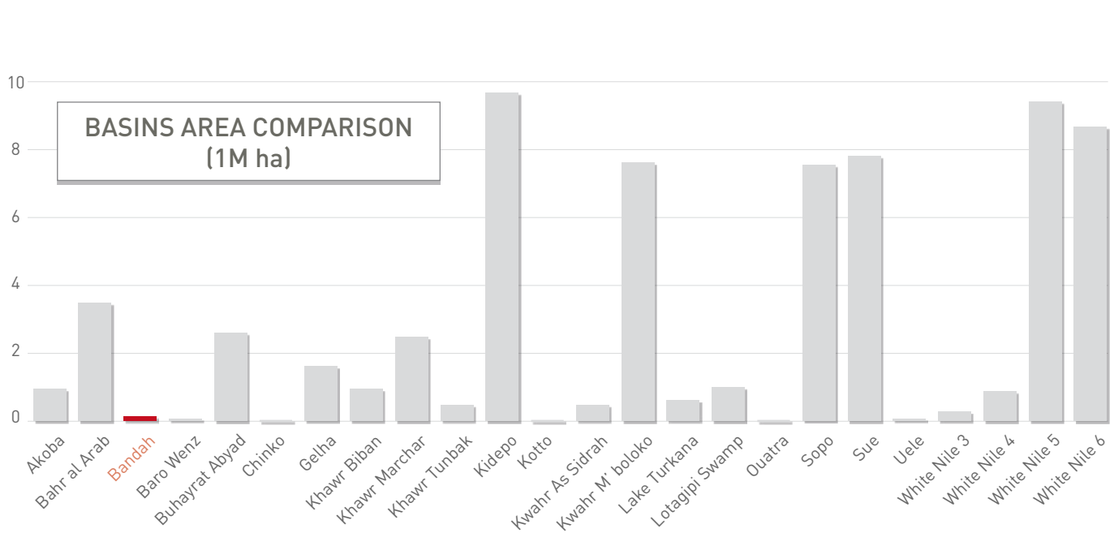
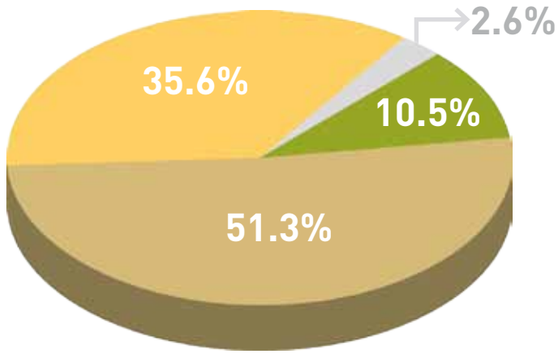


BANDAH

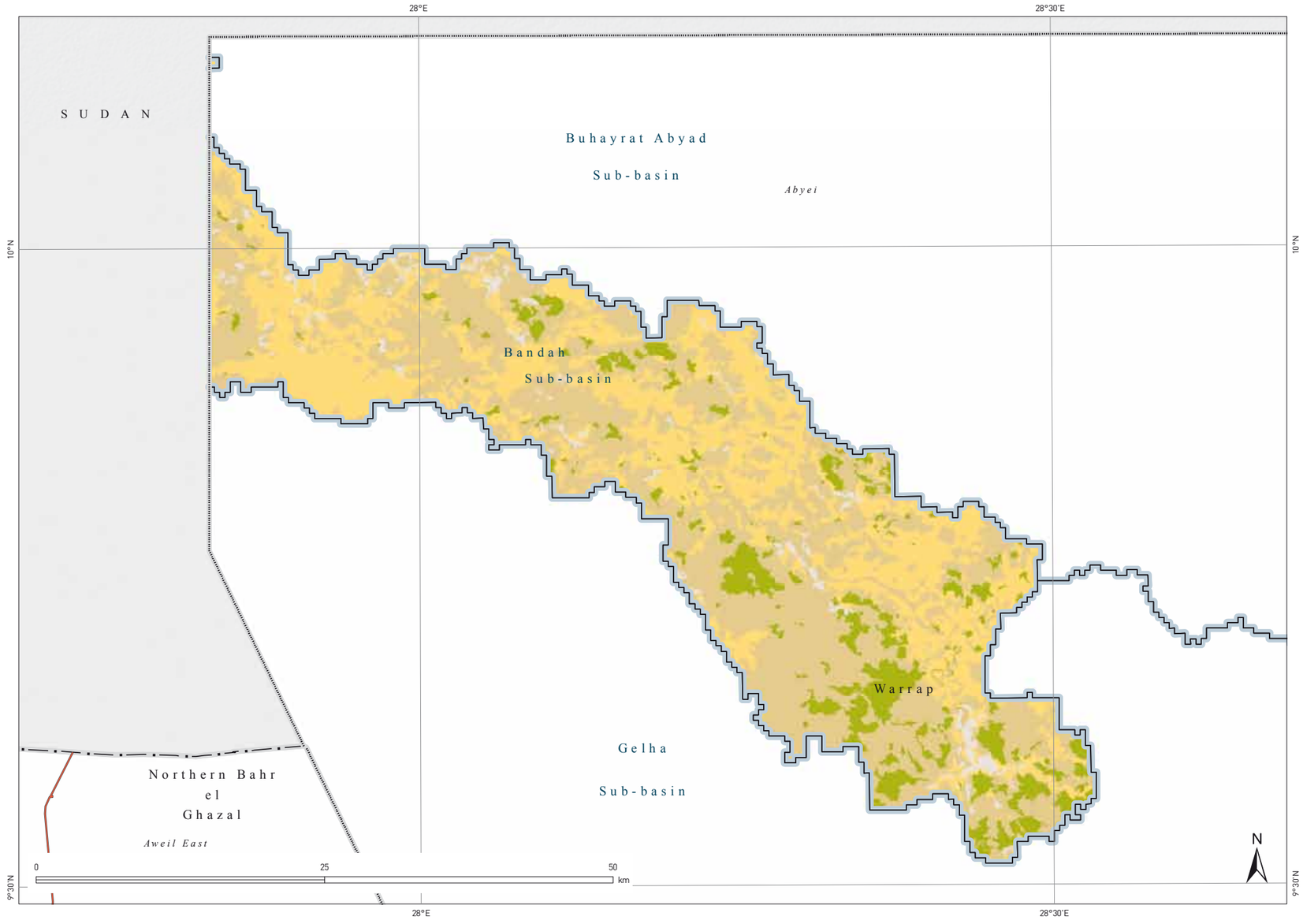


LAND COVER CLASSES IN HECTARES

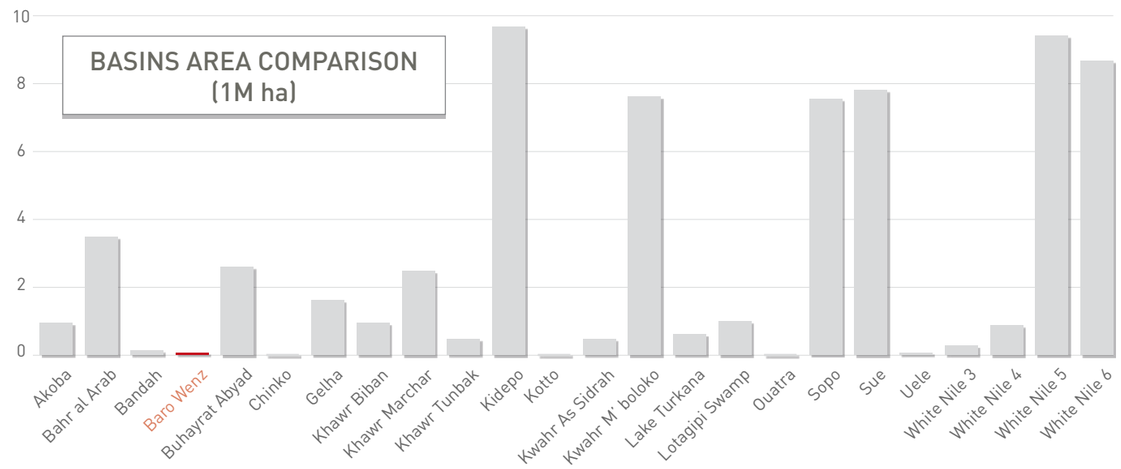
AG Agriculture in terrestrial and aquatic/regularly flooded land	0
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	16,060
SCO Shrubs closed-to-sparse in terrestrial and aquatic/ regularly flooded land	78,415
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/ regularly flooded land	54,369
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/ artificial waterbodies	3,913
TOTAL AREA	152,757

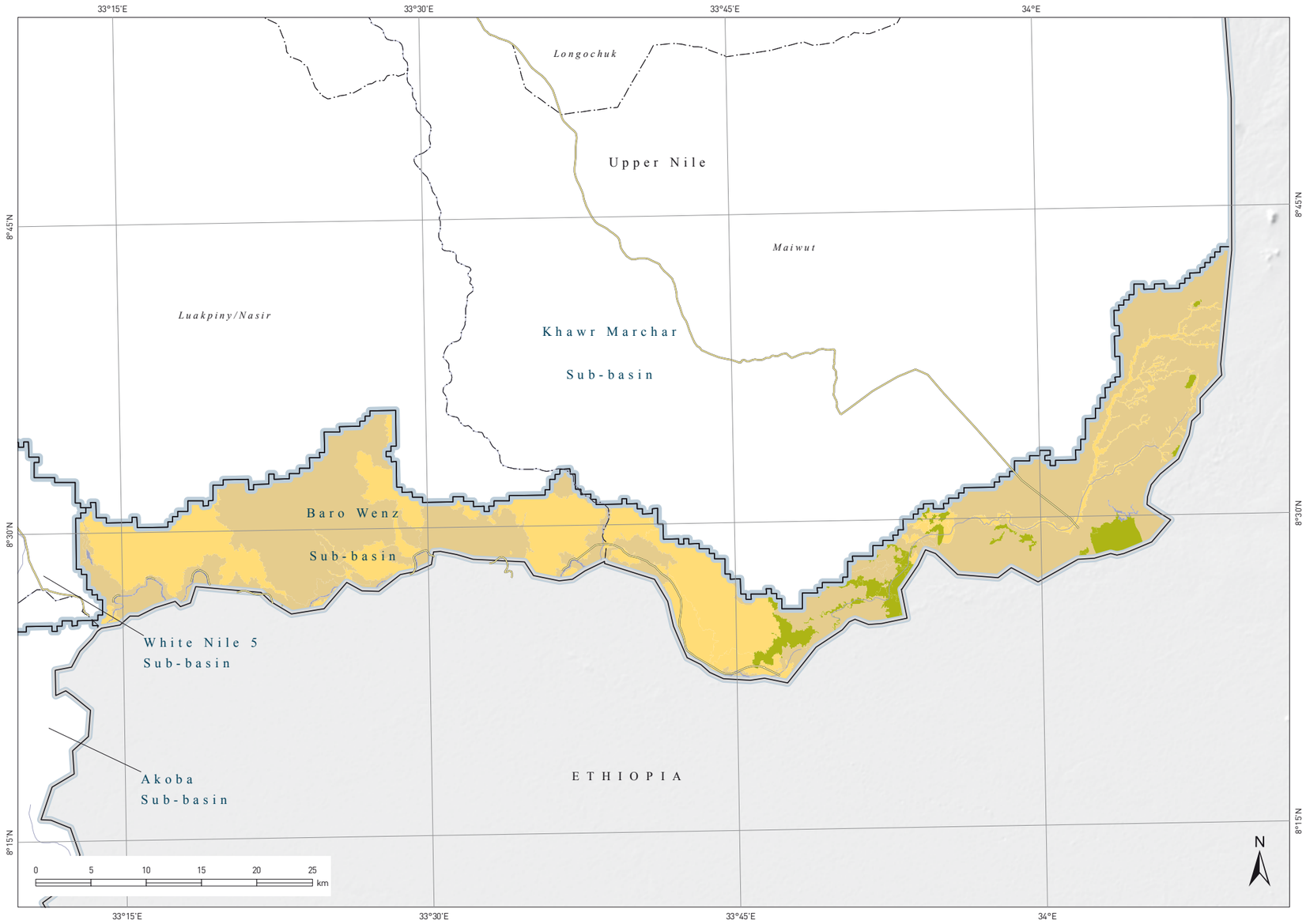


Note: Only classes representing more than 0.5 % of the area are shown in the chart



INDEX MAP

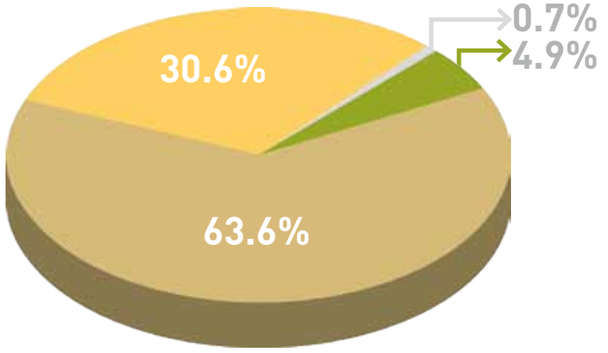




BARO WENZ

LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	198
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	4,771
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	61,519
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	29,536
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	633
TOTAL AREA	96,657

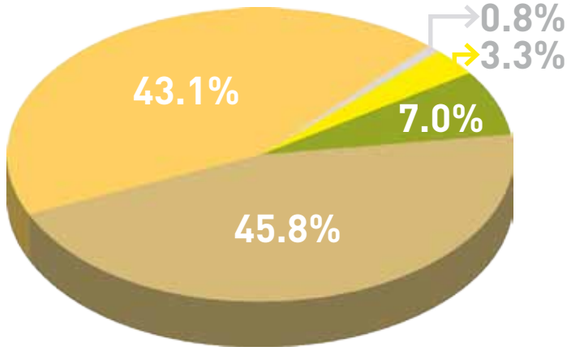


Note: Only classes representing more than 0.5 % of the area are shown in the chart

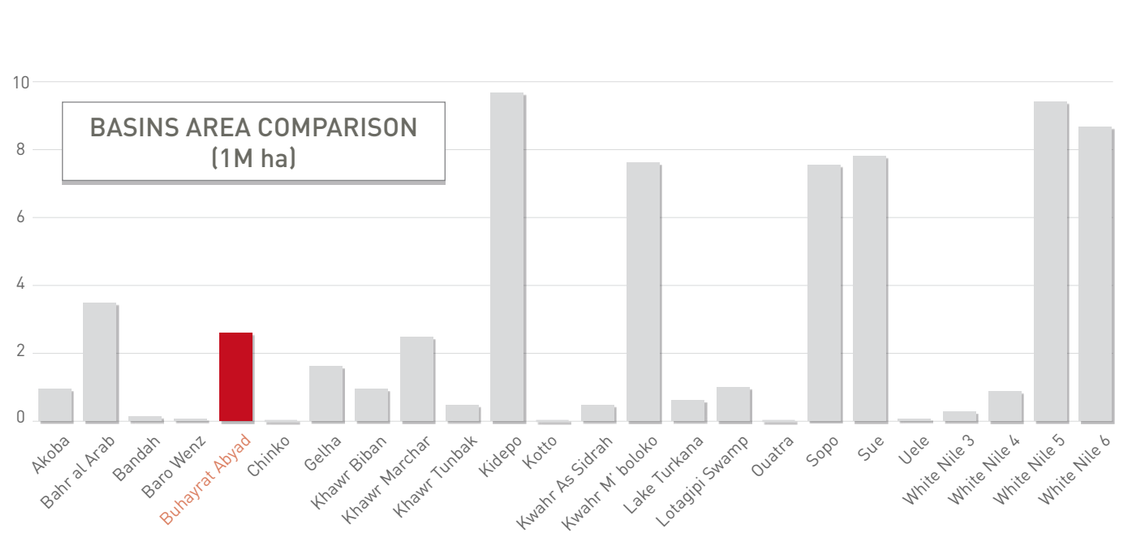
BUHAYRAT ABYAD

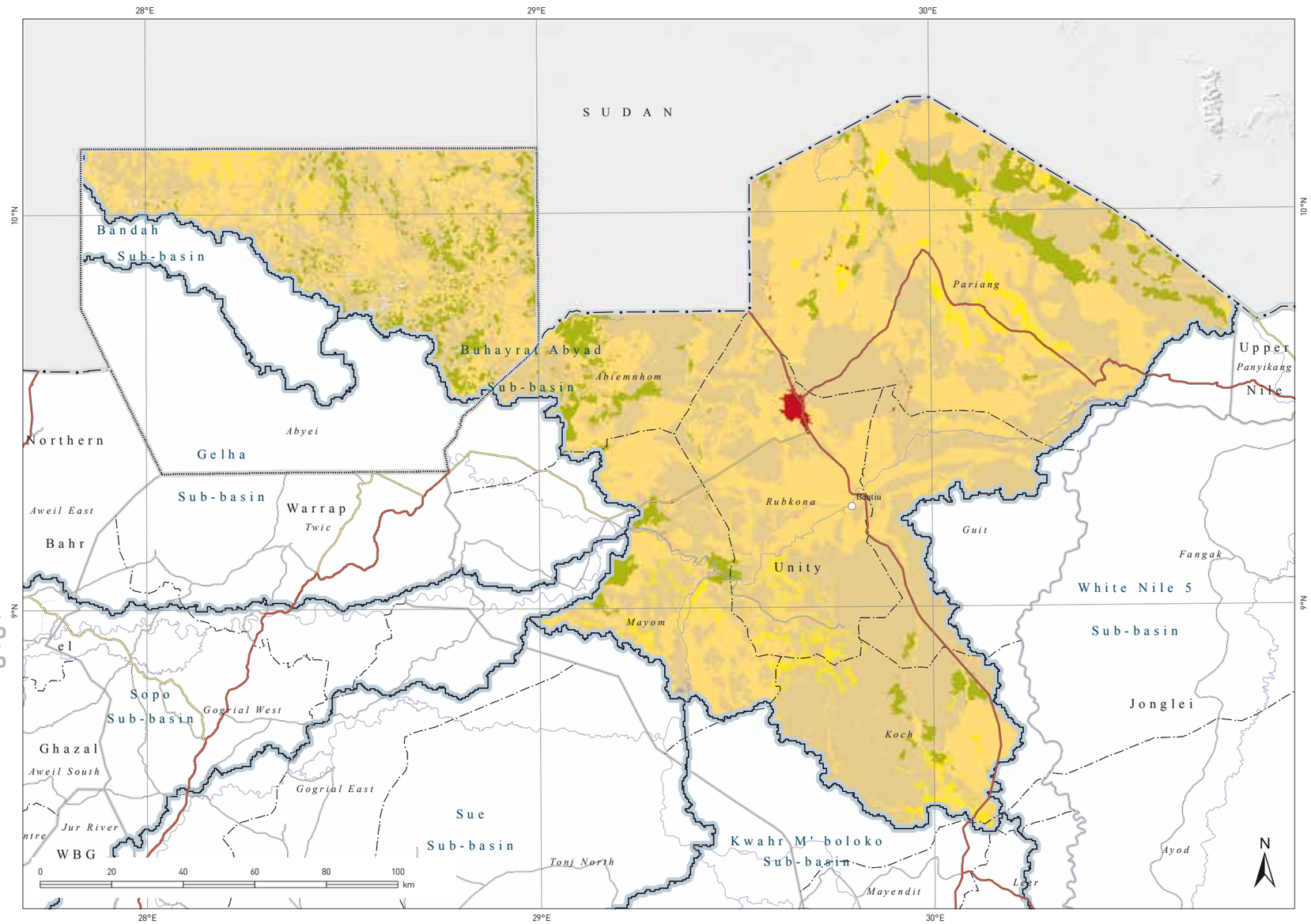
LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	85,240
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	180,075
SCO Shrubs closed-to-sparse in terrestrial and aquatic/ regularly flooded land	1,180,206
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/ regularly flooded land	1,111,106
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/ artificial waterbodies	20,494
TOTAL AREA	2,577,121

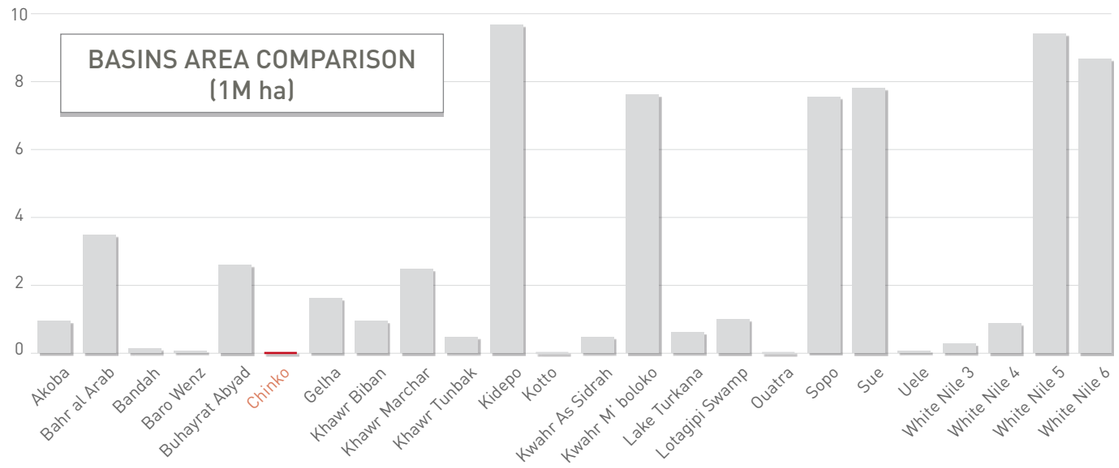


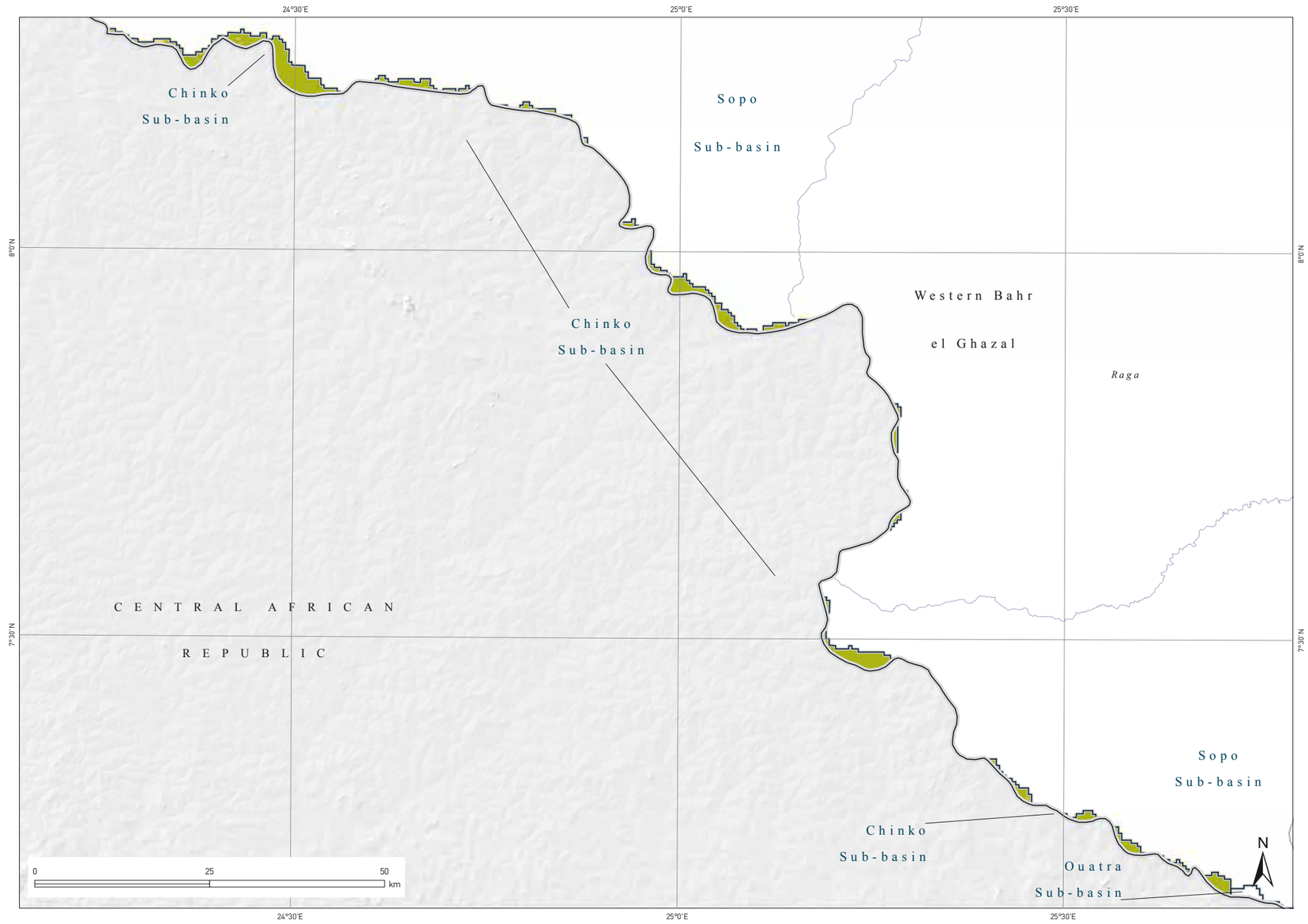
Note: Only classes representing more than 0.5 % of the area are shown in the chart





INDEX MAP

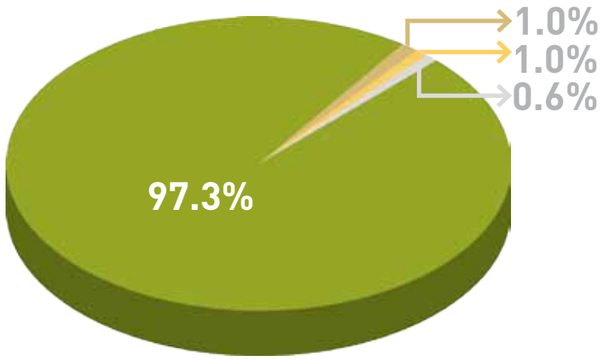




CHINKO

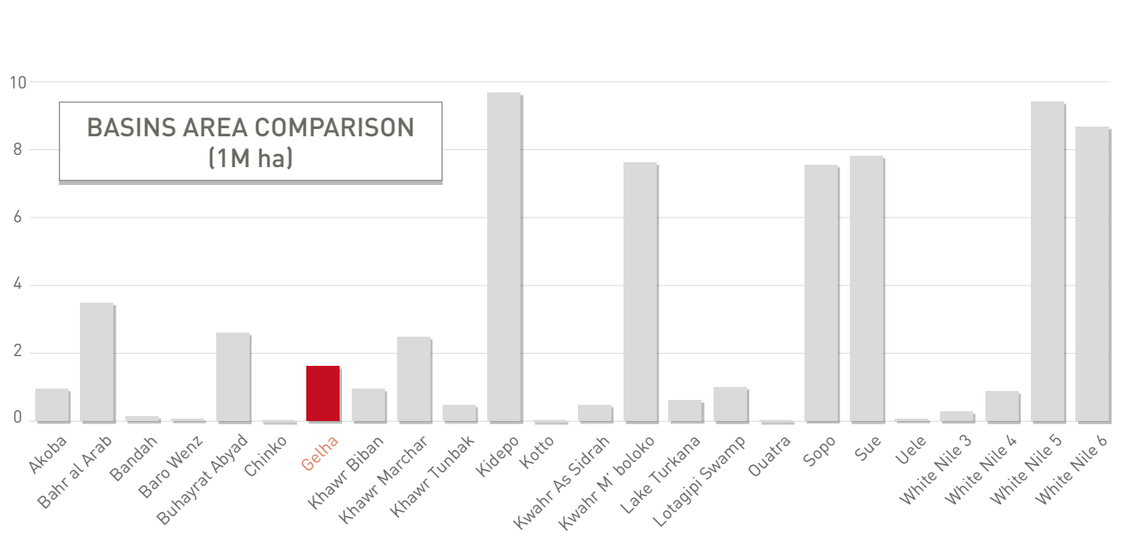
LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	0
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	15,870
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	169
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	171
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	99
TOTAL AREA	16,309



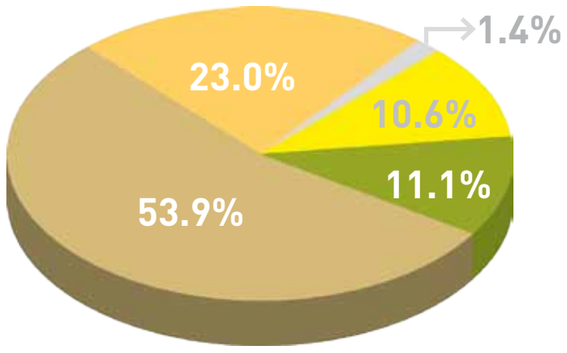
Note: Only classes representing more than 0.5 % of the area are shown in the chart

GELHA

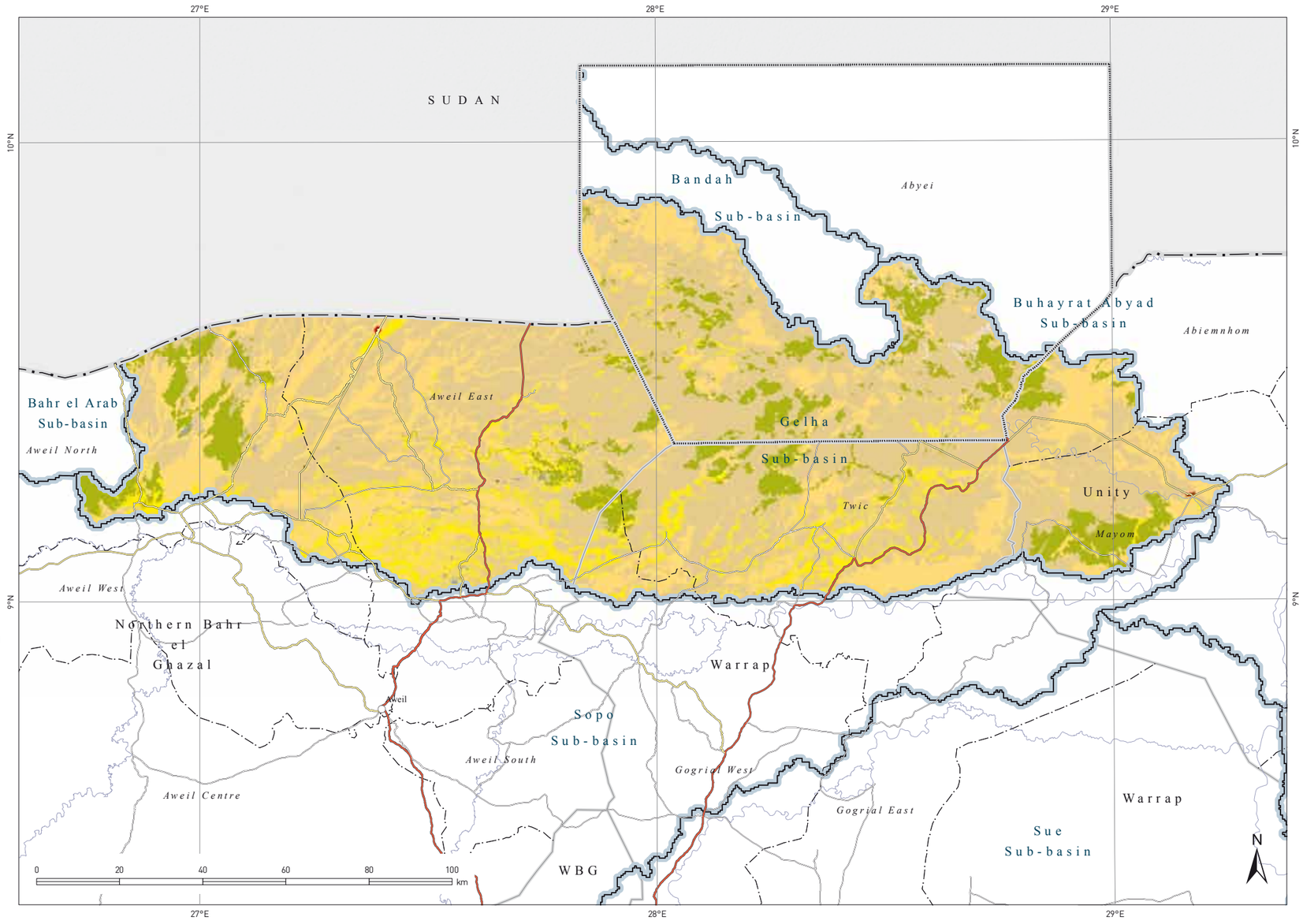


LAND COVER CLASSES IN HECTARES

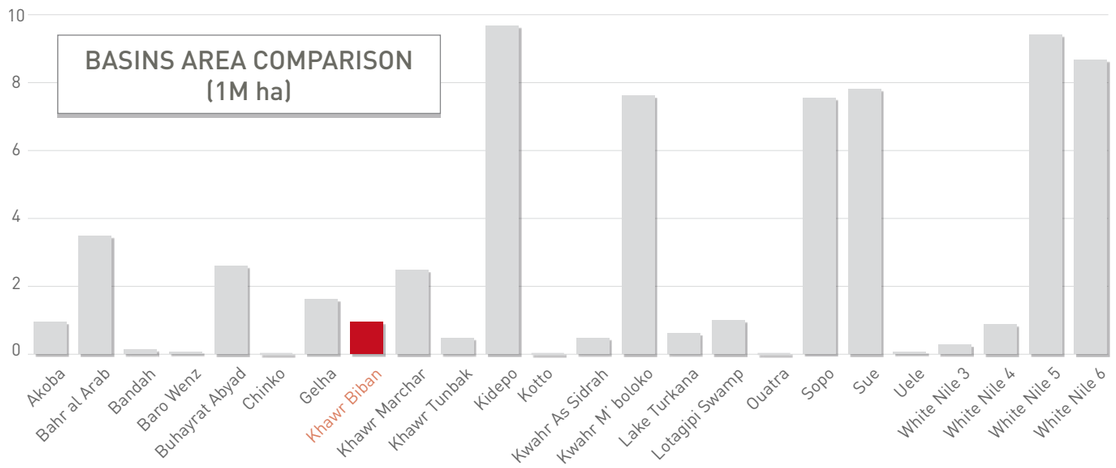
AG Agriculture in terrestrial and aquatic/regularly flooded land	170,034
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	178,199
SCO Shrubs closed-to-sparse in terrestrial and aquatic/ regularly flooded land	863,761
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/ regularly flooded land	368,851
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/ artificial waterbodies	22,167
TOTAL AREA	1,603,013

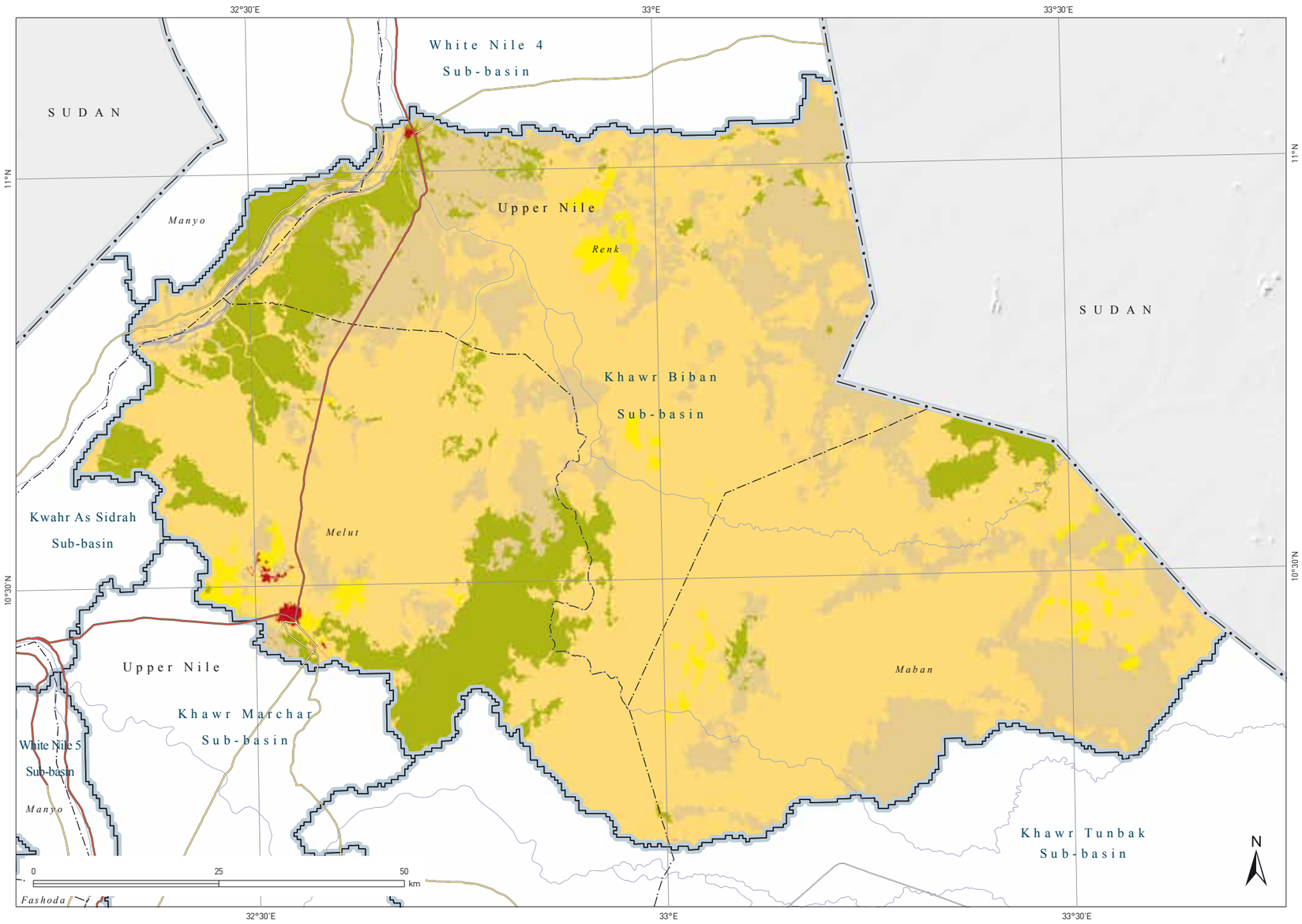


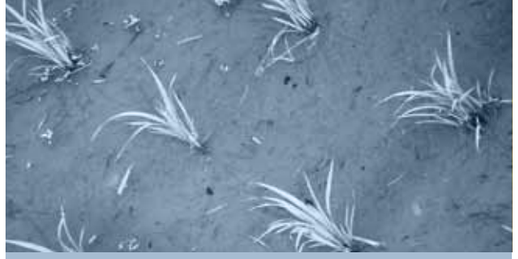
Note: Only classes representing more than 0.5 % of the area are shown in the chart



INDEX MAP



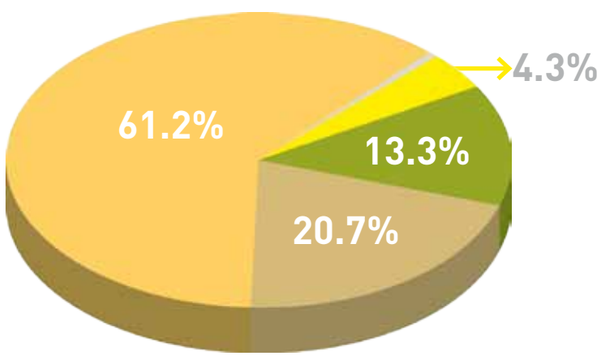




KHAWR BIBAN

LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	40,048
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	124,679
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	194,413
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	575,282
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	4,840
TOTAL AREA	939,262

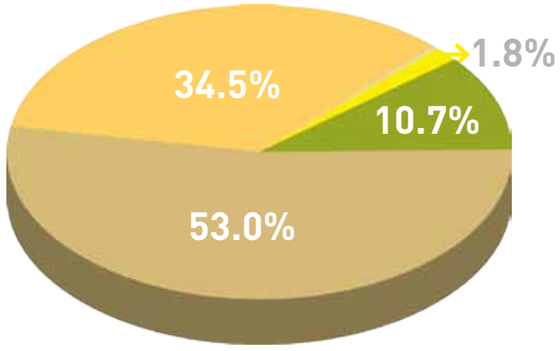


Note: Only classes representing more than 0.5 % of the area are shown in the chart

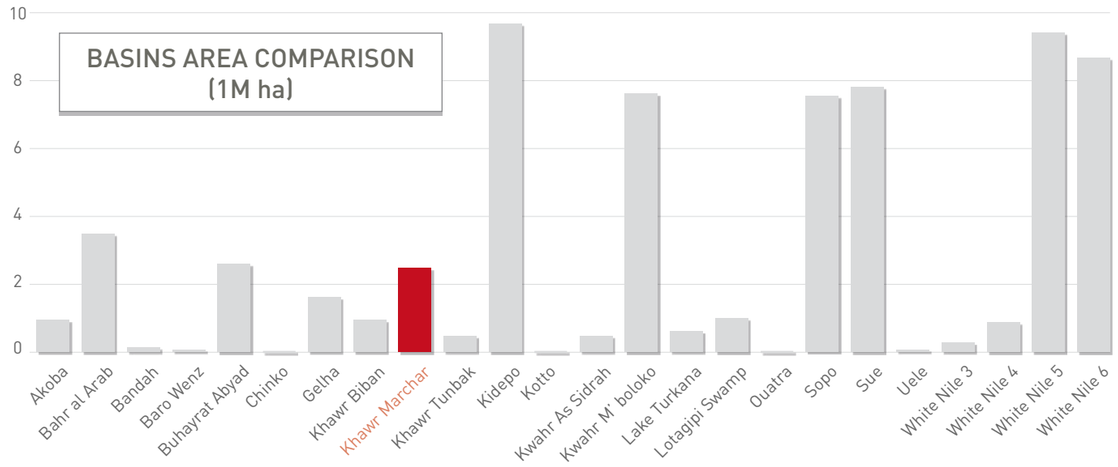
KHAWR MARCHAR

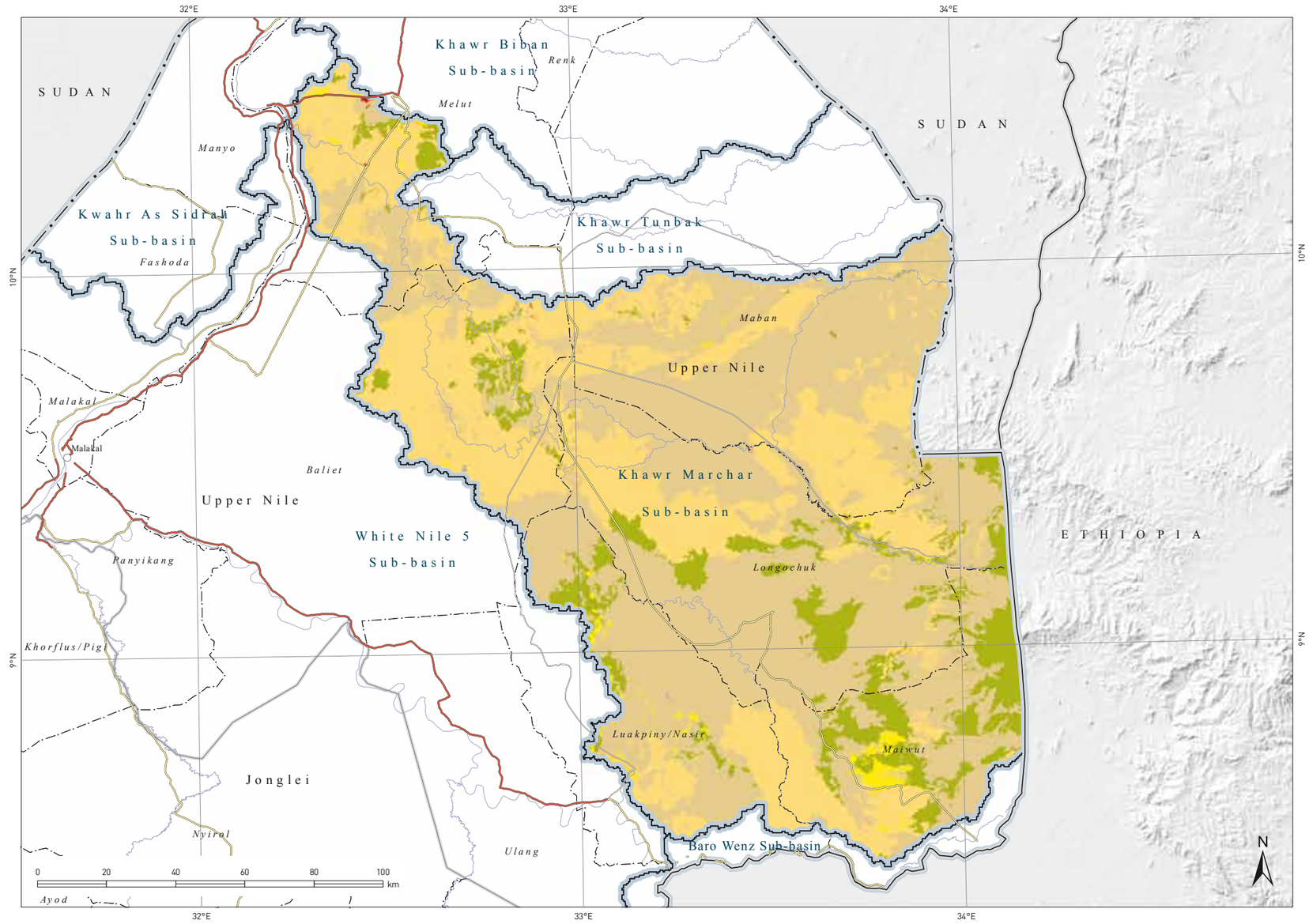
LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	43,189
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	260,614
SCO Shrubs closed-to-sparse in terrestrial and aquatic/ regularly flooded land	1,294,629
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/ regularly flooded land	842,080
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/ artificial waterbodies	2,511
TOTAL AREA	2,443,022

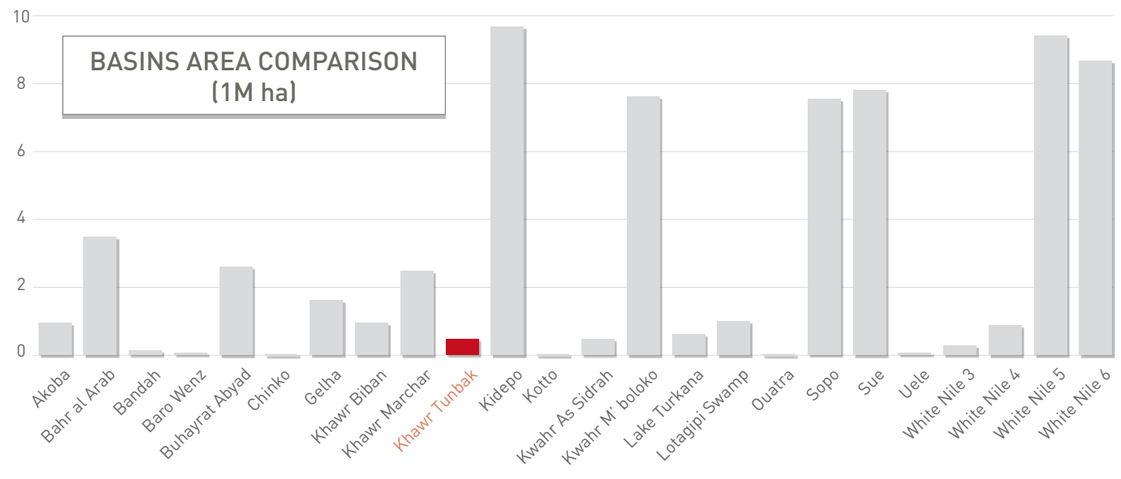


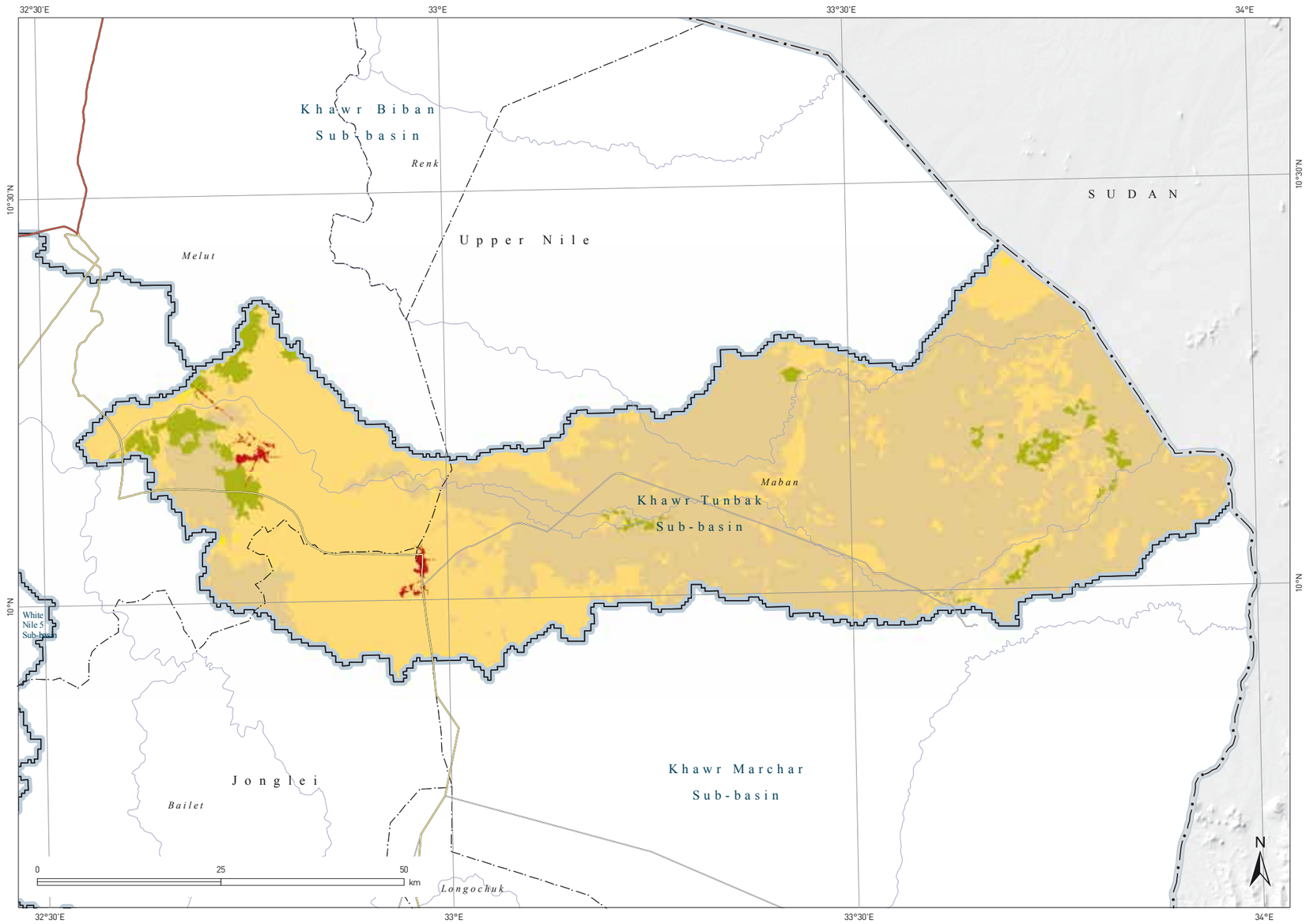
Note: Only classes representing more than 0.5 % of the area are shown in the chart





INDEX MAP

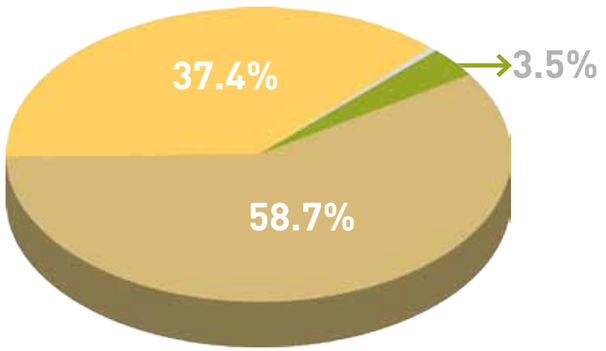




KHAWR TUNBAK

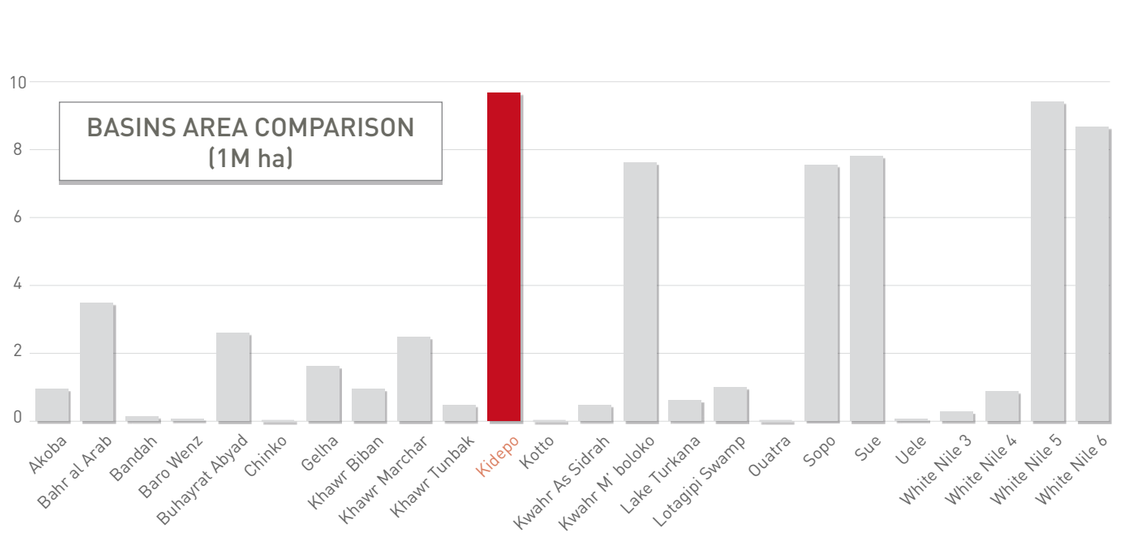
LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	626
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	16,399
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	276,589
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	176,351
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	1,449
TOTAL AREA	471,414



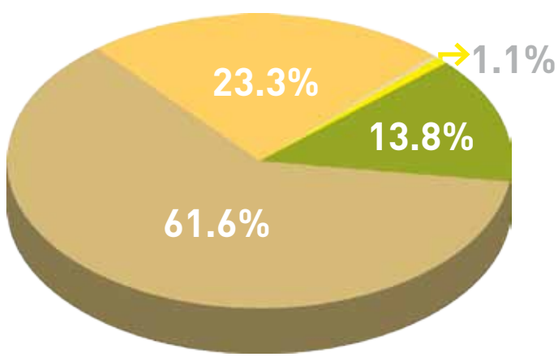
Note: Only classes representing more than 0.5 % of the area are shown in the chart

KIDEPO

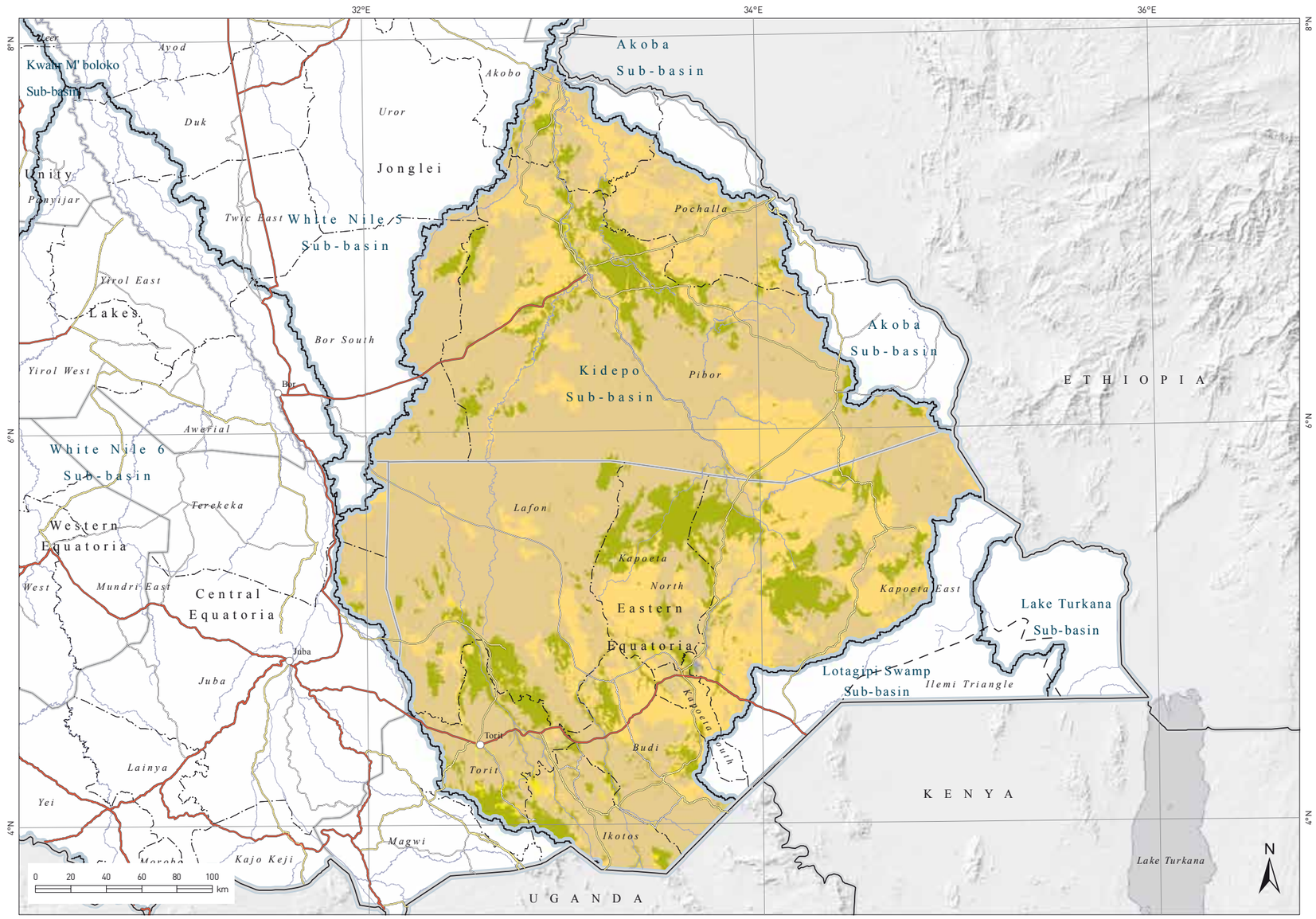


LAND COVER CLASSES IN HECTARES

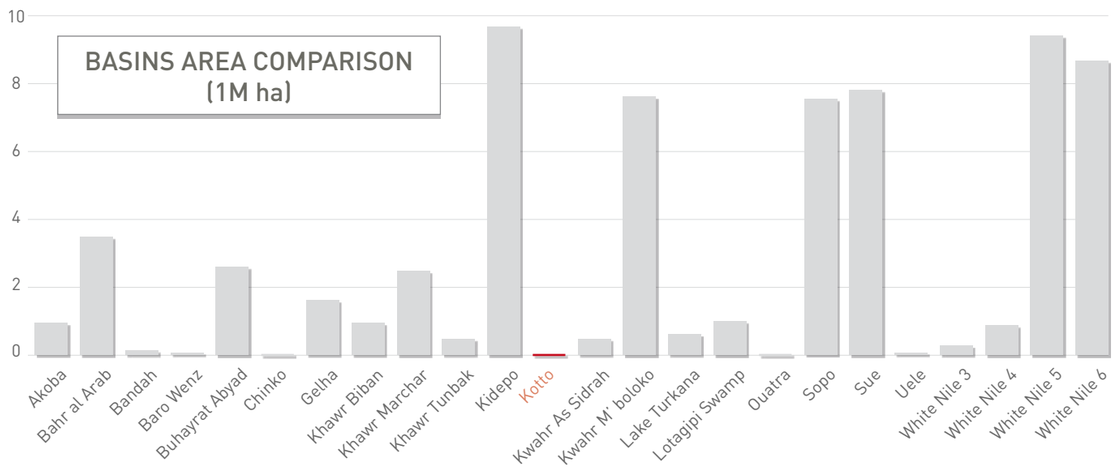
AG Agriculture in terrestrial and aquatic/regularly flooded land	103,565
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	1,316,933
SCO Shrubs closed-to-sparse in terrestrial and aquatic/ regularly flooded land	5,895,131
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/ regularly flooded land	2,227,652
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/ artificial waterbodies	21,099
TOTAL AREA	9,564,380

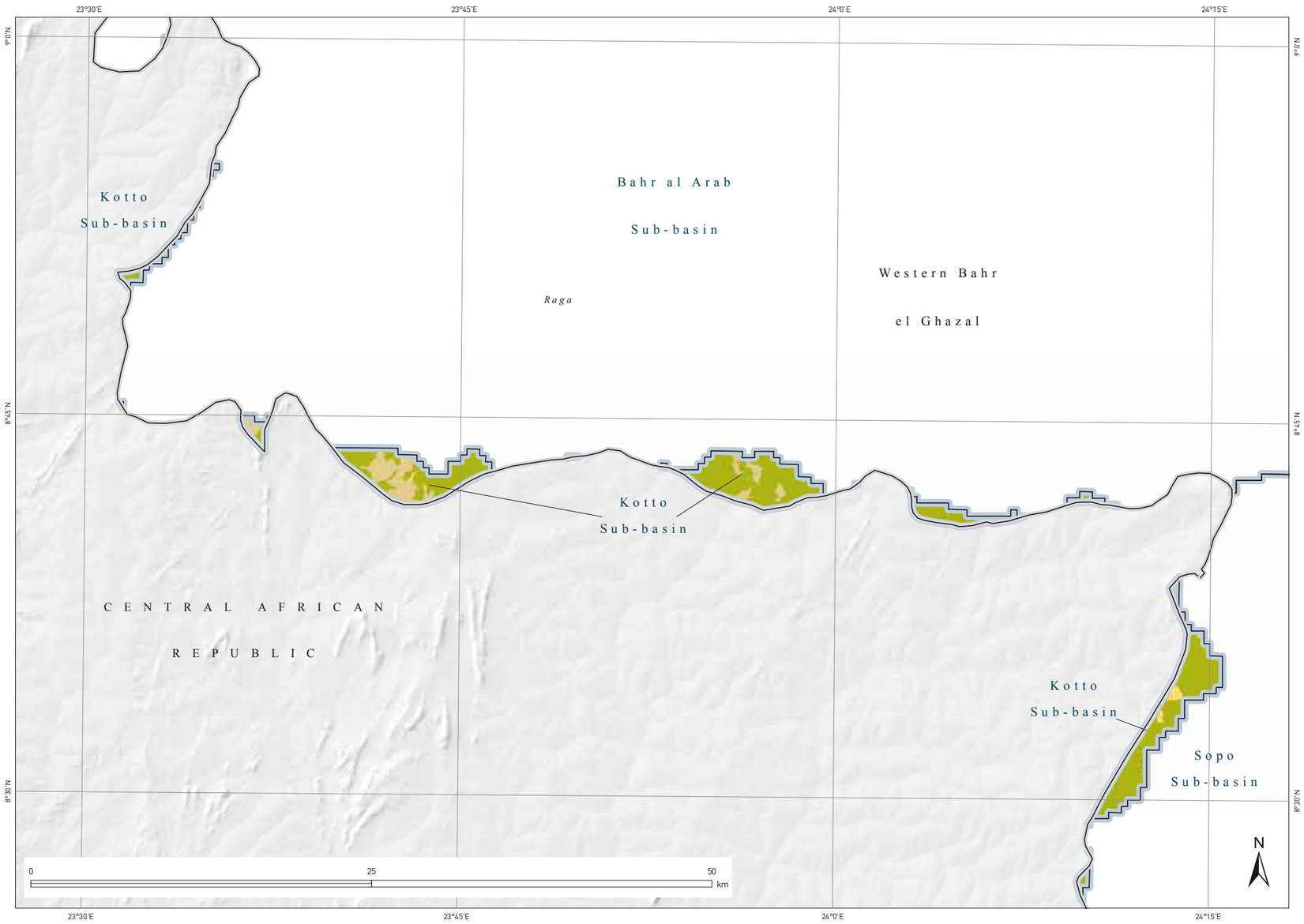


Note: Only classes representing more than 0.5 % of the area are shown in the chart



INDEX MAP

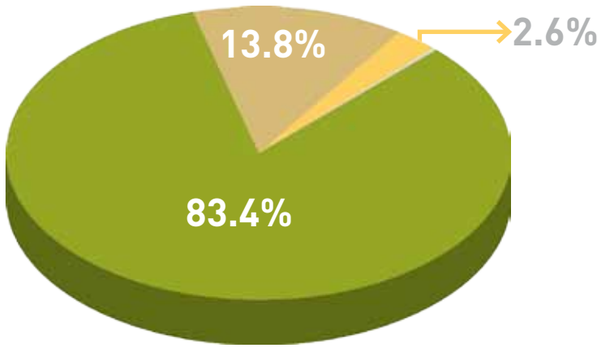




KOTTO

LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	0
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	8,684
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	1,433
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	274
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	23
TOTAL AREA	10,414

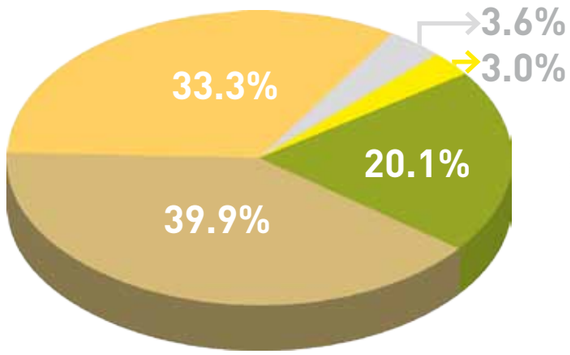


Note: Only classes representing more than 0.5 % of the area are shown in the chart

KWAHR AS SIDRAH

LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	13,516
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	91,417
SCO Shrubs closed-to-sparse in terrestrial and aquatic/ regularly flooded land	181,461
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/ regularly flooded land	151,396
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/ artificial waterbodies	16,516
TOTAL AREA	454,305



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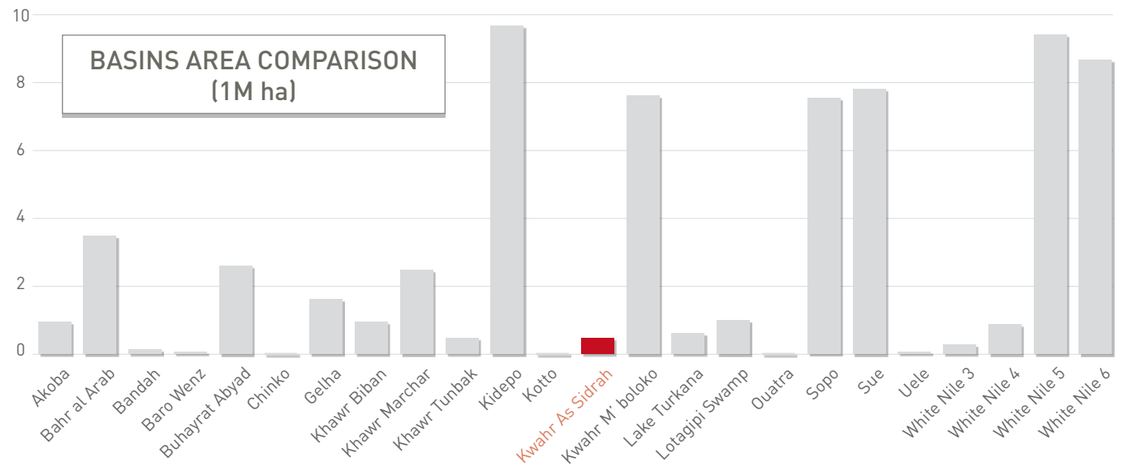
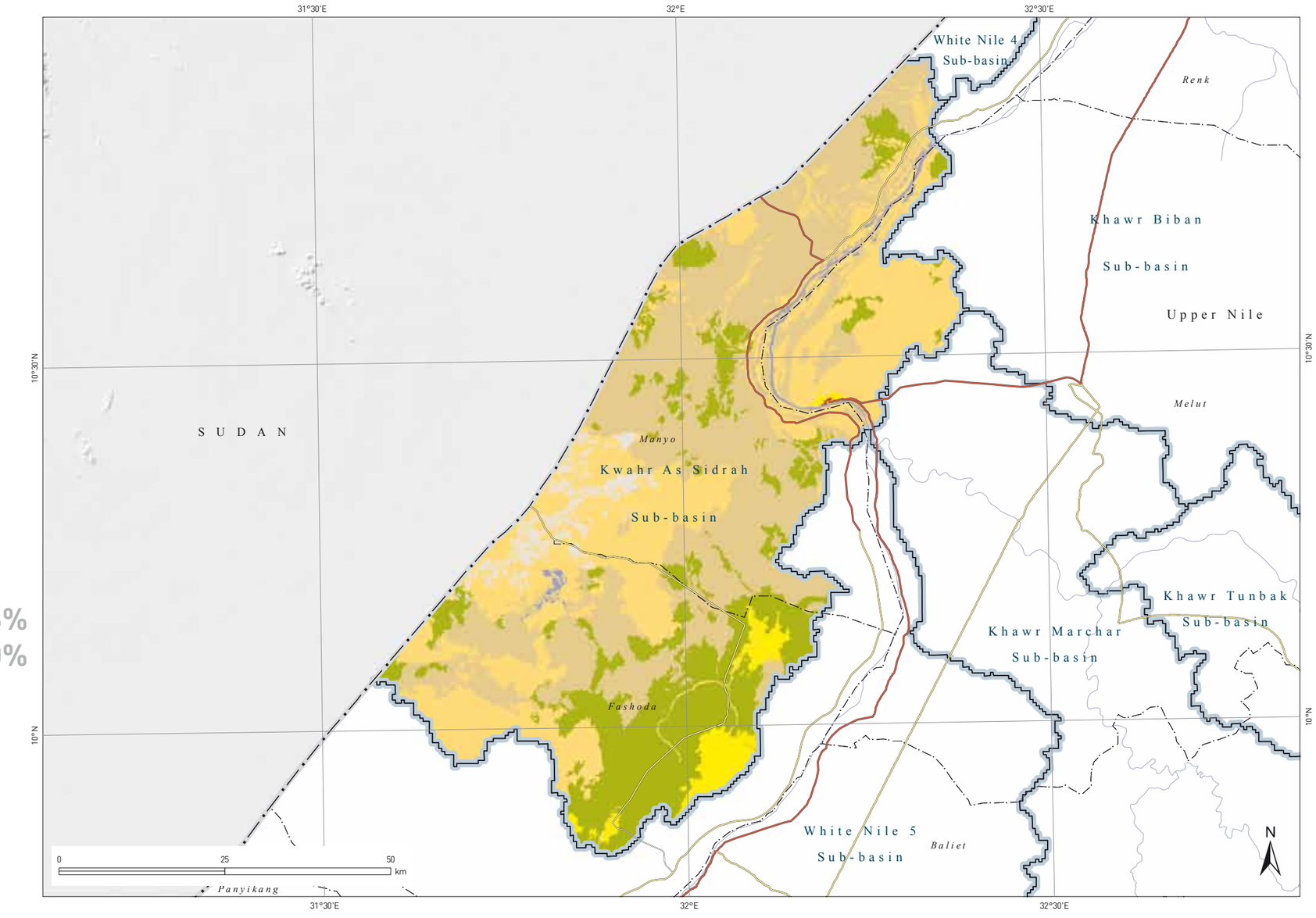
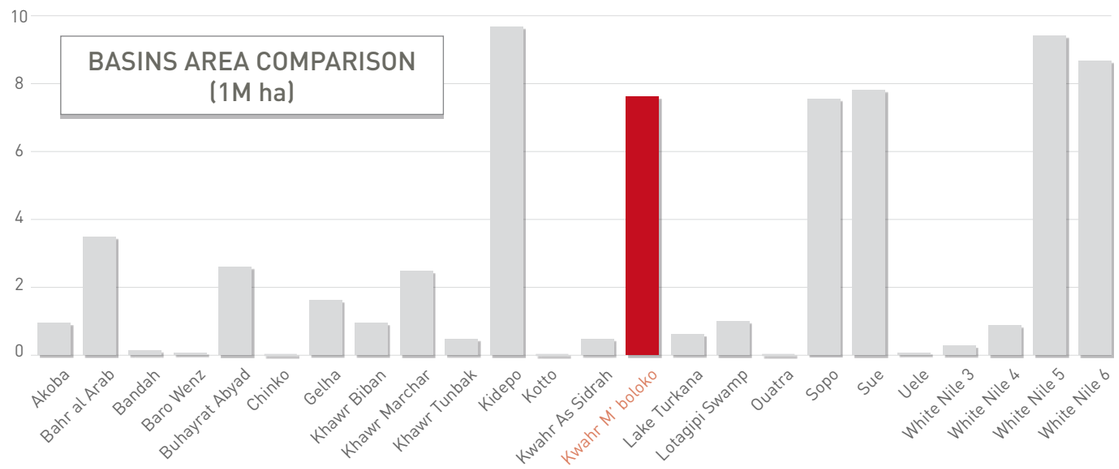
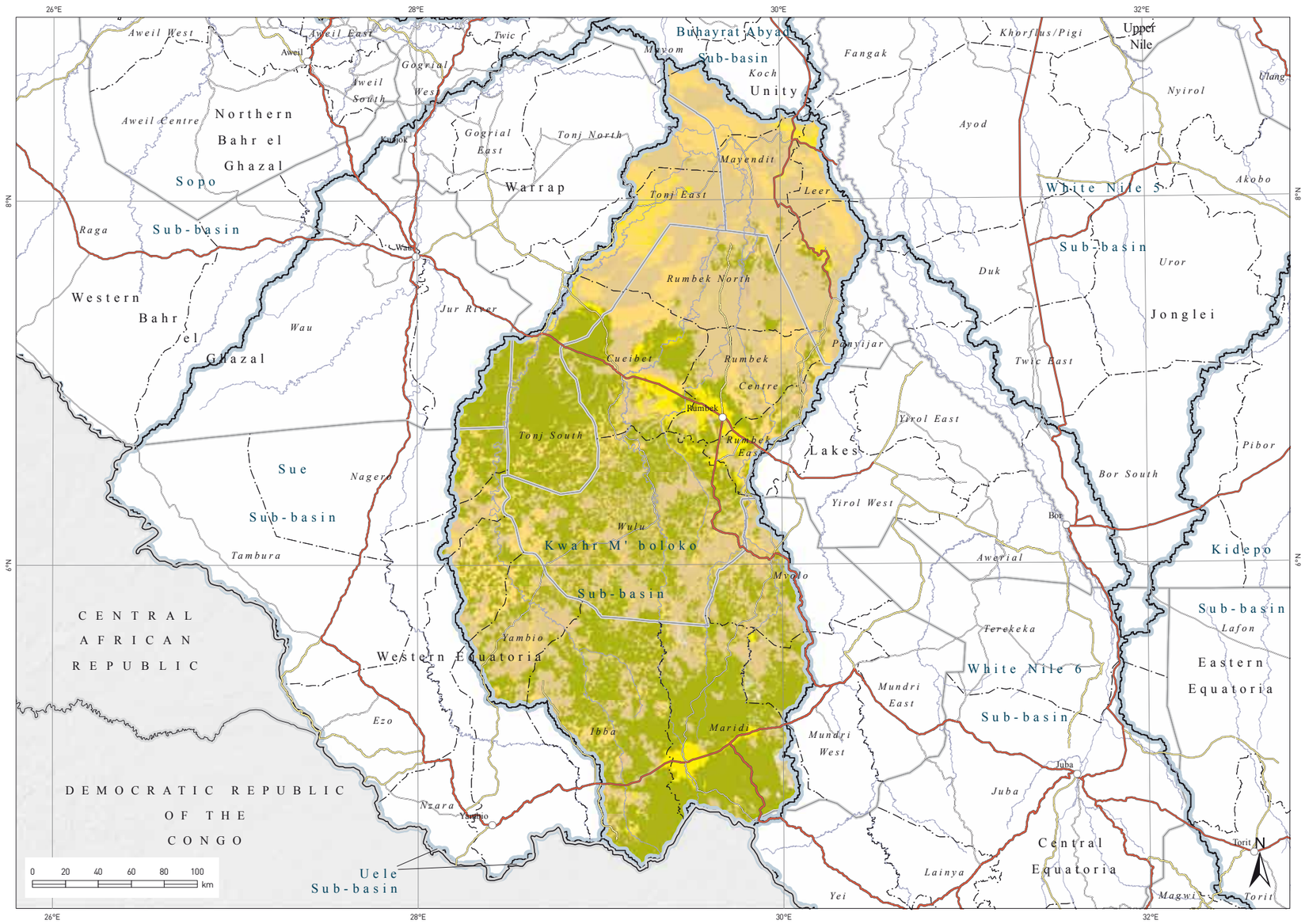




INDEX MAP

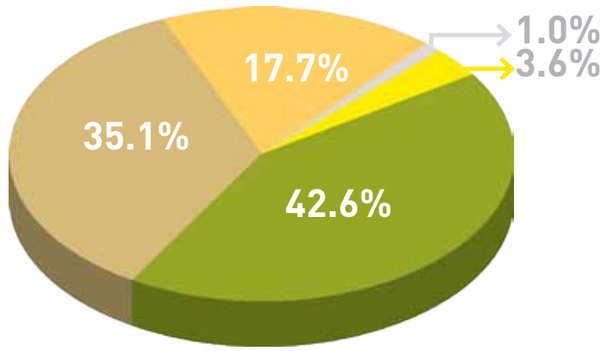




KWAHR M' BOLOKO

LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	273,032
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	3,197,997
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	2,631,094
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	1,327,288
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	71,428
TOTAL AREA	7,500,839

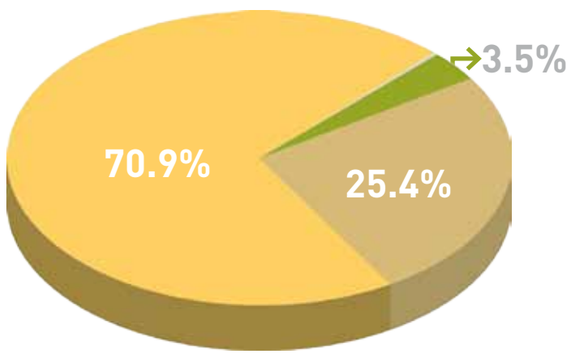


Note: Only classes representing more than 0.5 % of the area are shown in the chart

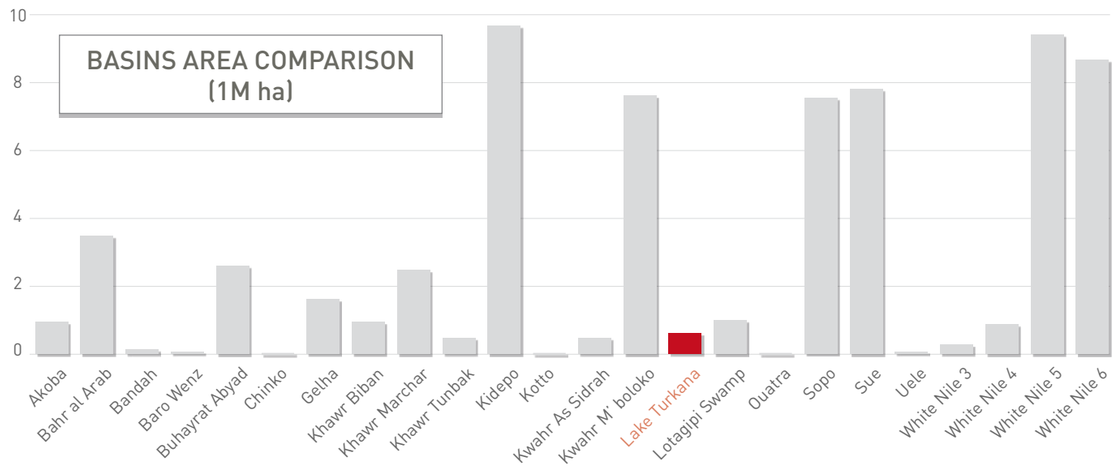
LAKE TURKANA

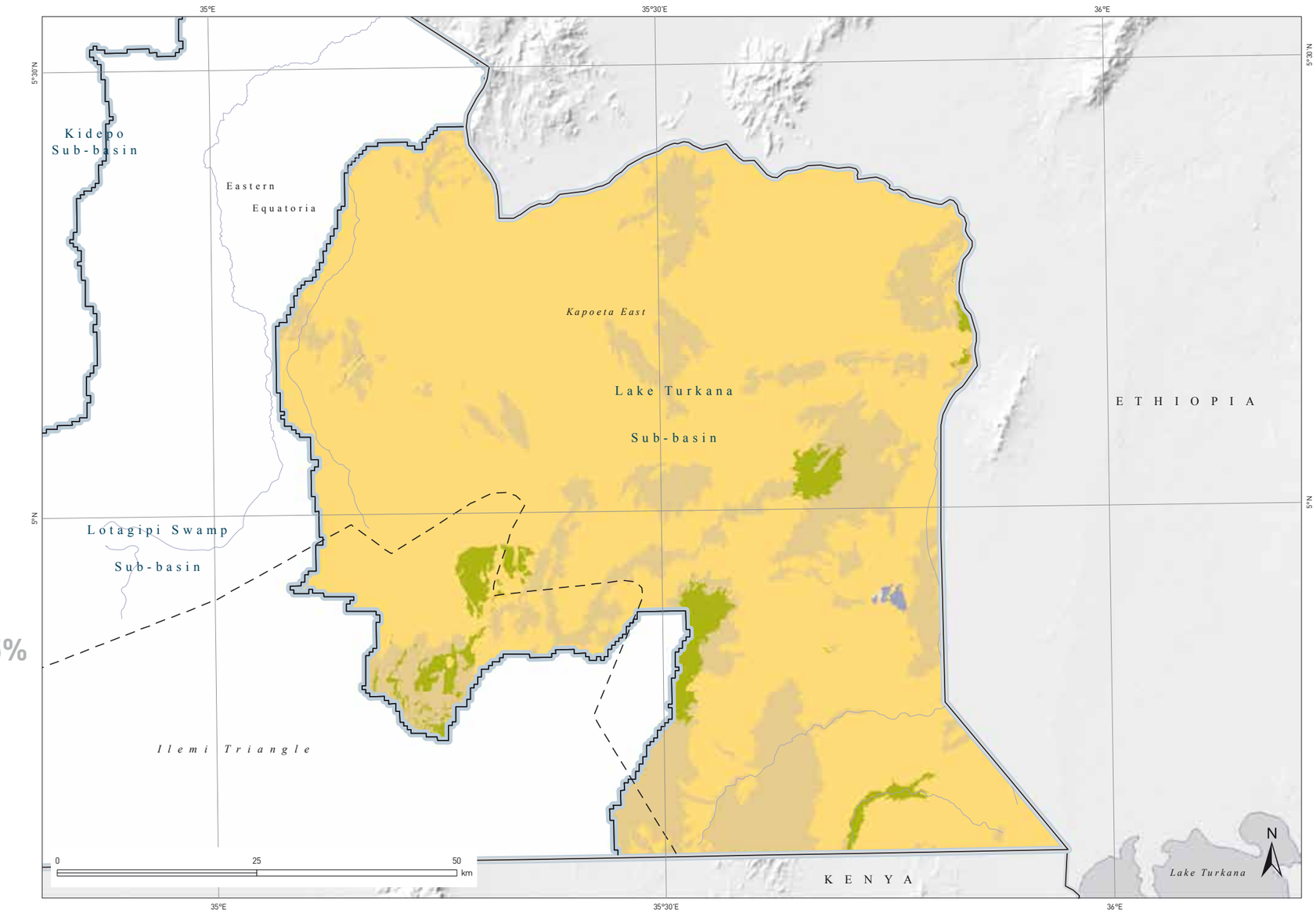
LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	0
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	21,079
SCO Shrubs closed-to-sparse in terrestrial and aquatic/ regularly flooded land	152,864
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/ regularly flooded land	426,319
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/ artificial waterbodies	901
TOTAL AREA	601,163

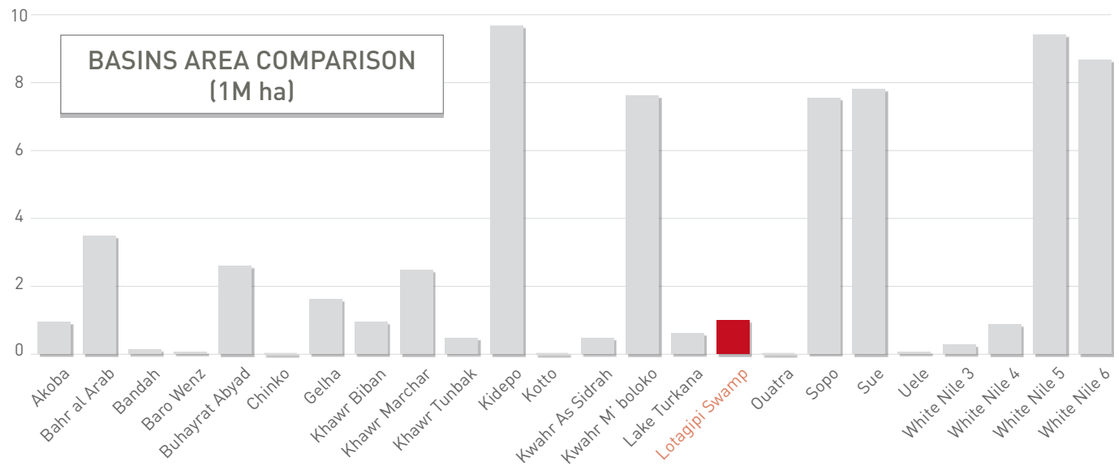


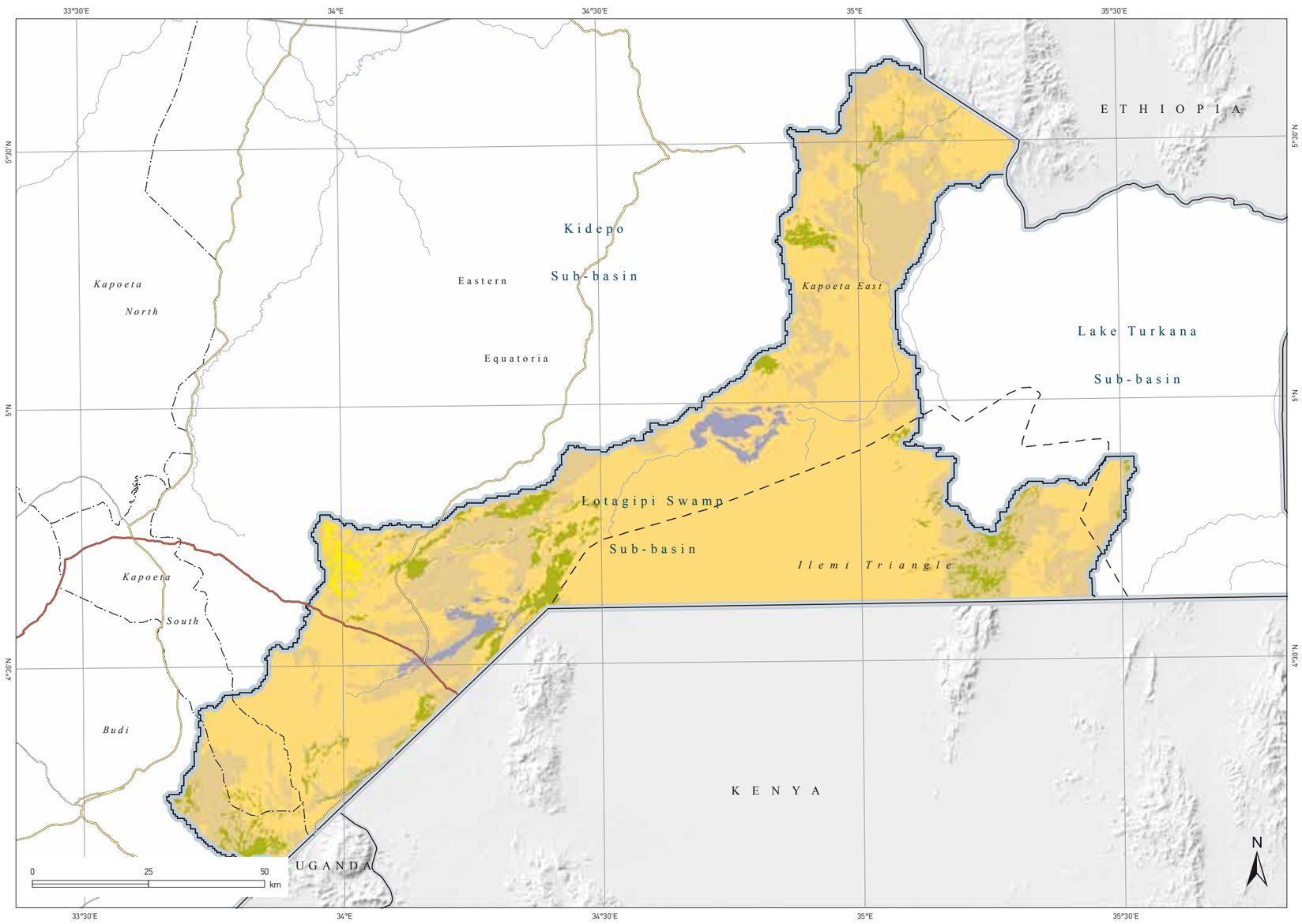
Note: Only classes representing more than 0.5 % of the area are shown in the chart





INDEX MAP

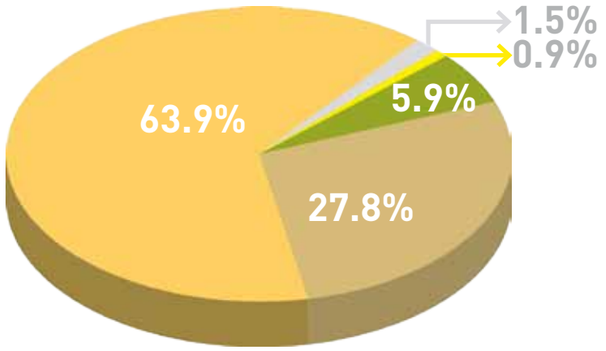




LOTAGIPI SWAMP

LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	9,191
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	57,557
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	273,096
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	627,715
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	14,683
TOTAL AREA	982,242

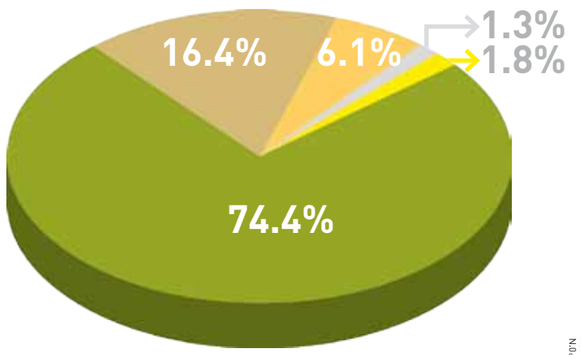


Note: Only classes representing more than 0.5 % of the area are shown in the chart

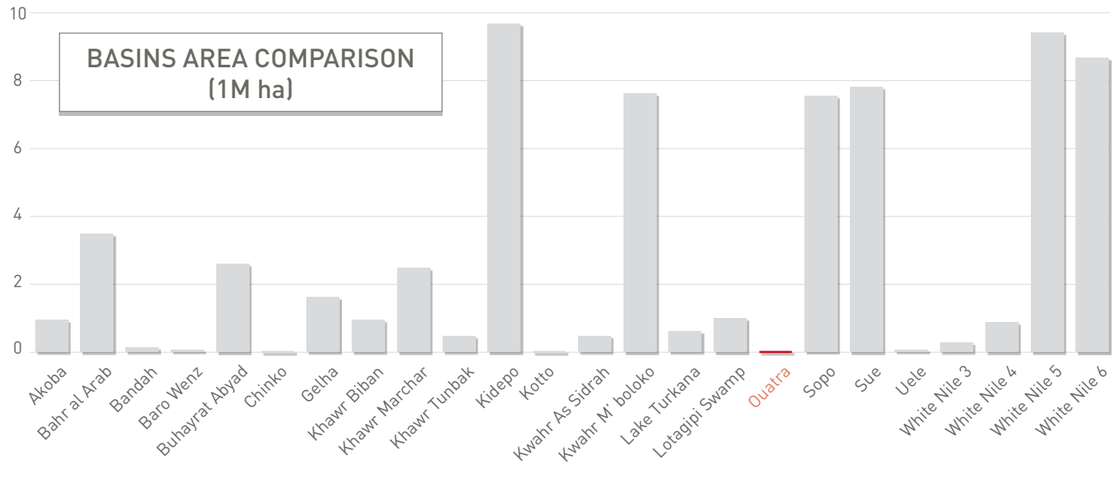
OUATRA

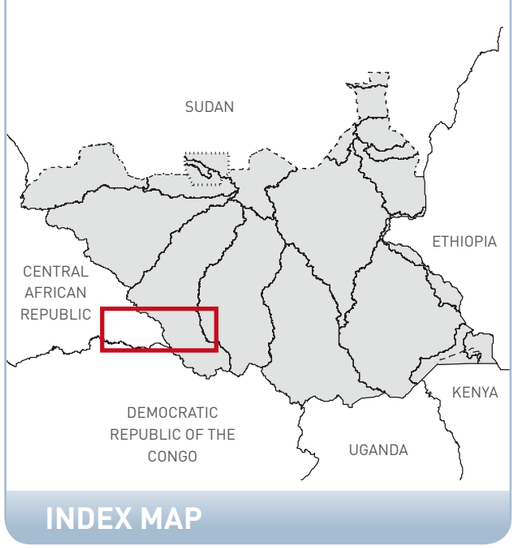
LAND COVER CLASSES IN HECTARES

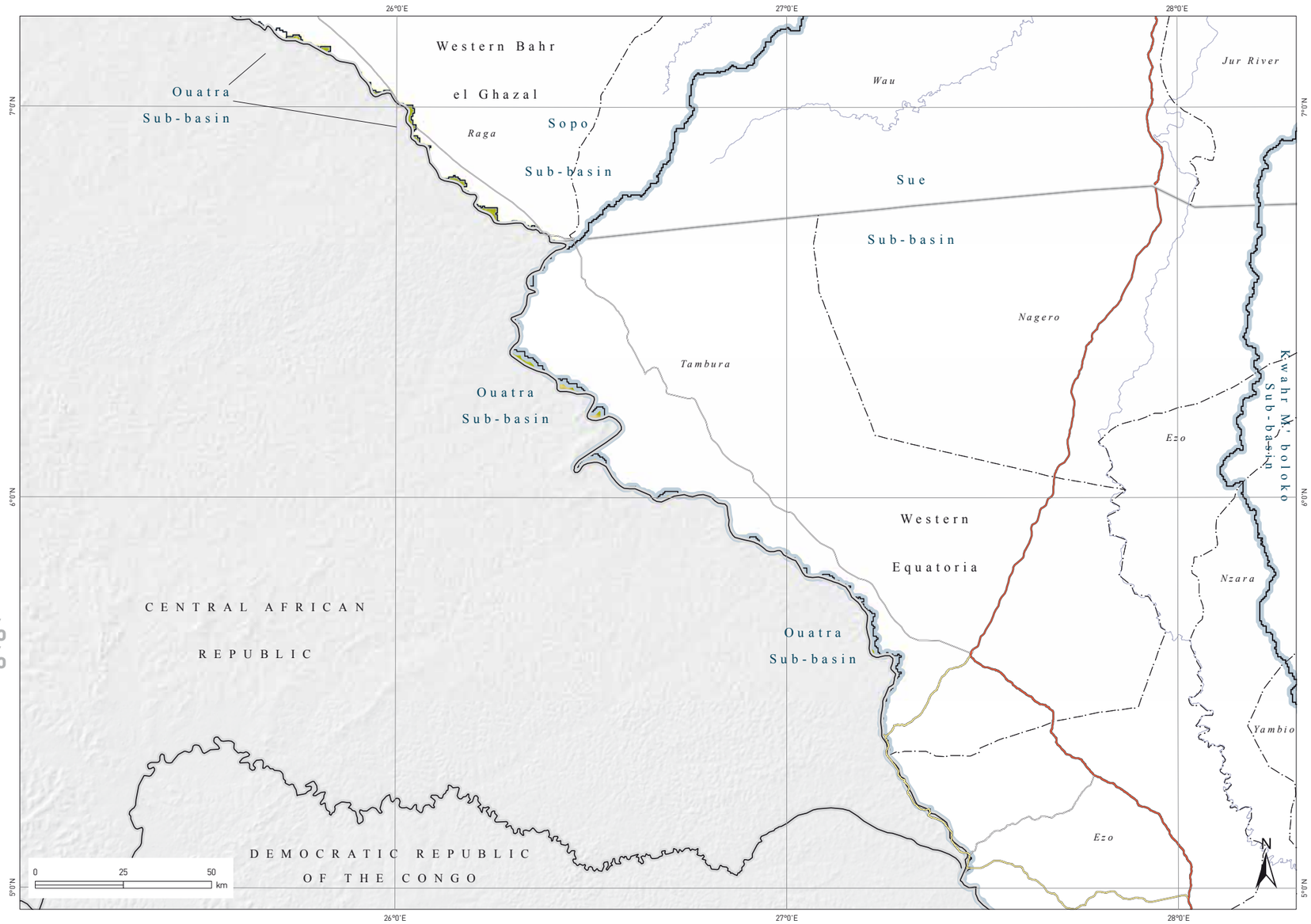
AG Agriculture in terrestrial and aquatic/regularly flooded land	444
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	18,585
SCO Shrubs closed-to-sparse in terrestrial and aquatic/ regularly flooded land	4,104
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/ regularly flooded land	1,515
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/ artificial waterbodies	336
TOTAL AREA	24,983



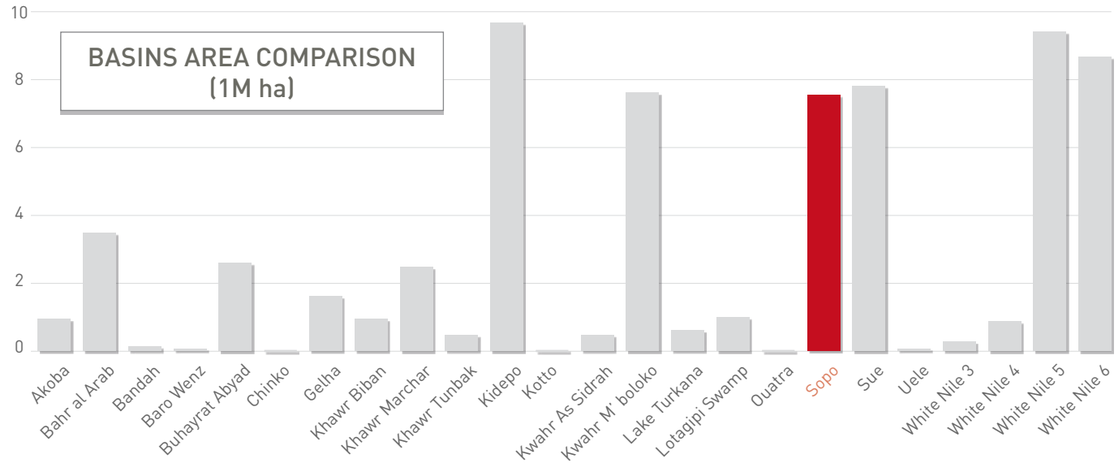
Note: Only classes representing more than 0.5 % of the area are shown in the chart

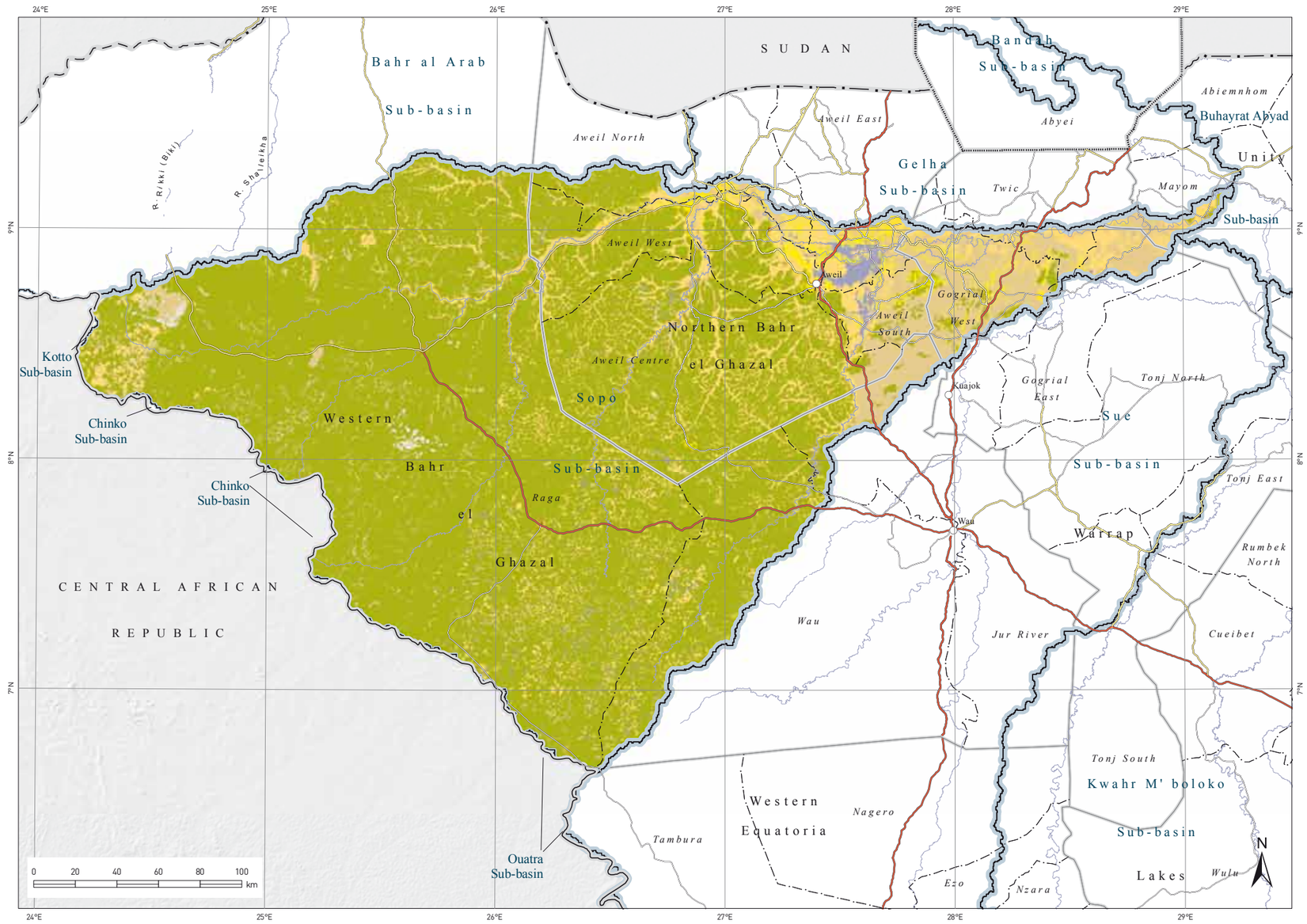






INDEX MAP

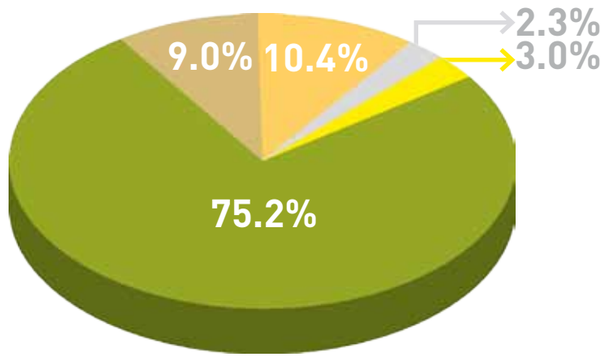




SOPO

LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	227,361
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	5,609,158
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	670,752
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	778,638
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	173,191
TOTAL AREA	7,459,100

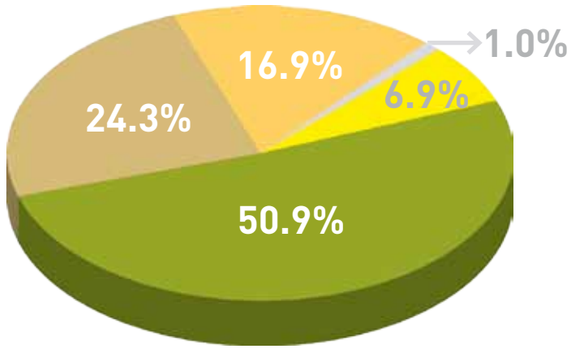


Note: Only classes representing more than 0.5 % of the area are shown in the chart

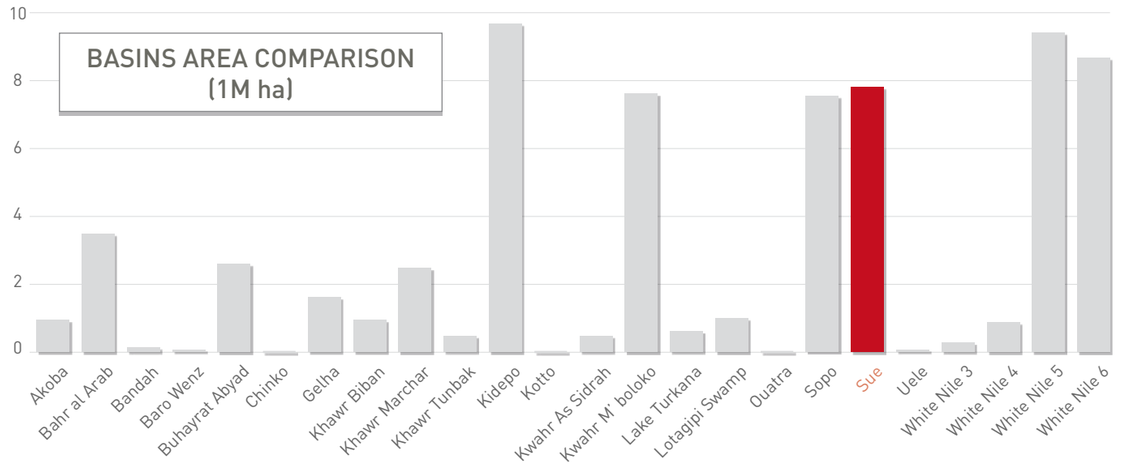
SUE

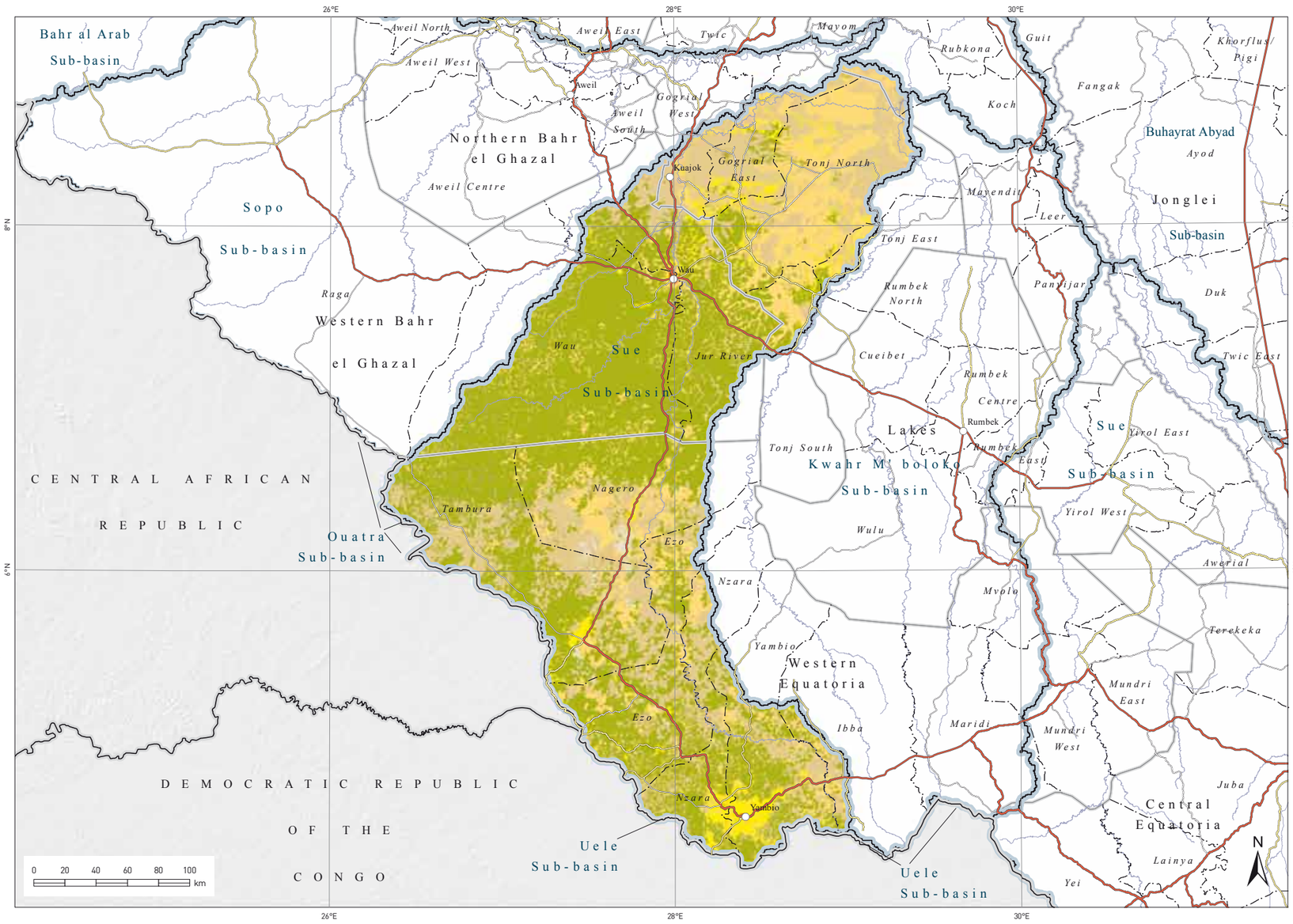
LAND COVER CLASSES IN HECTARES

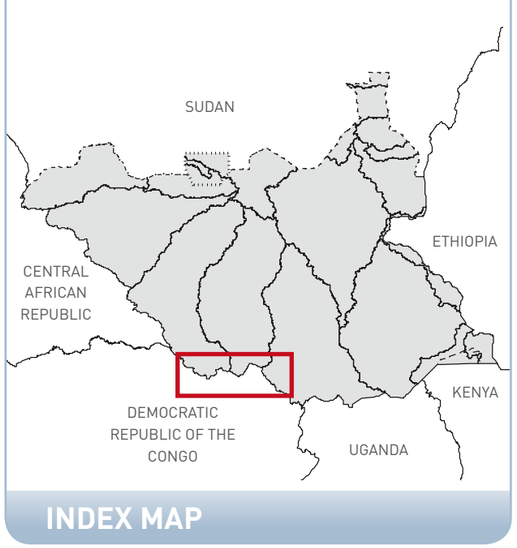
AG Agriculture in terrestrial and aquatic/regularly flooded land	529,813
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	3,907,604
SCO Shrubs closed-to-sparse in terrestrial and aquatic/ regularly flooded land	1,868,303
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/ regularly flooded land	1,297,830
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/ artificial waterbodies	78,774
TOTAL AREA	7,682,324



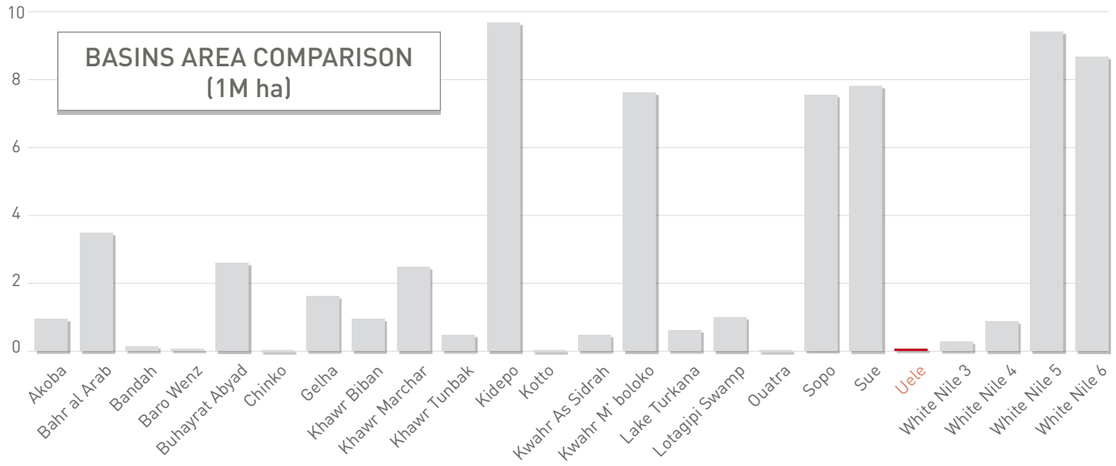
Note: Only classes representing more than 0.5 % of the area are shown in the chart

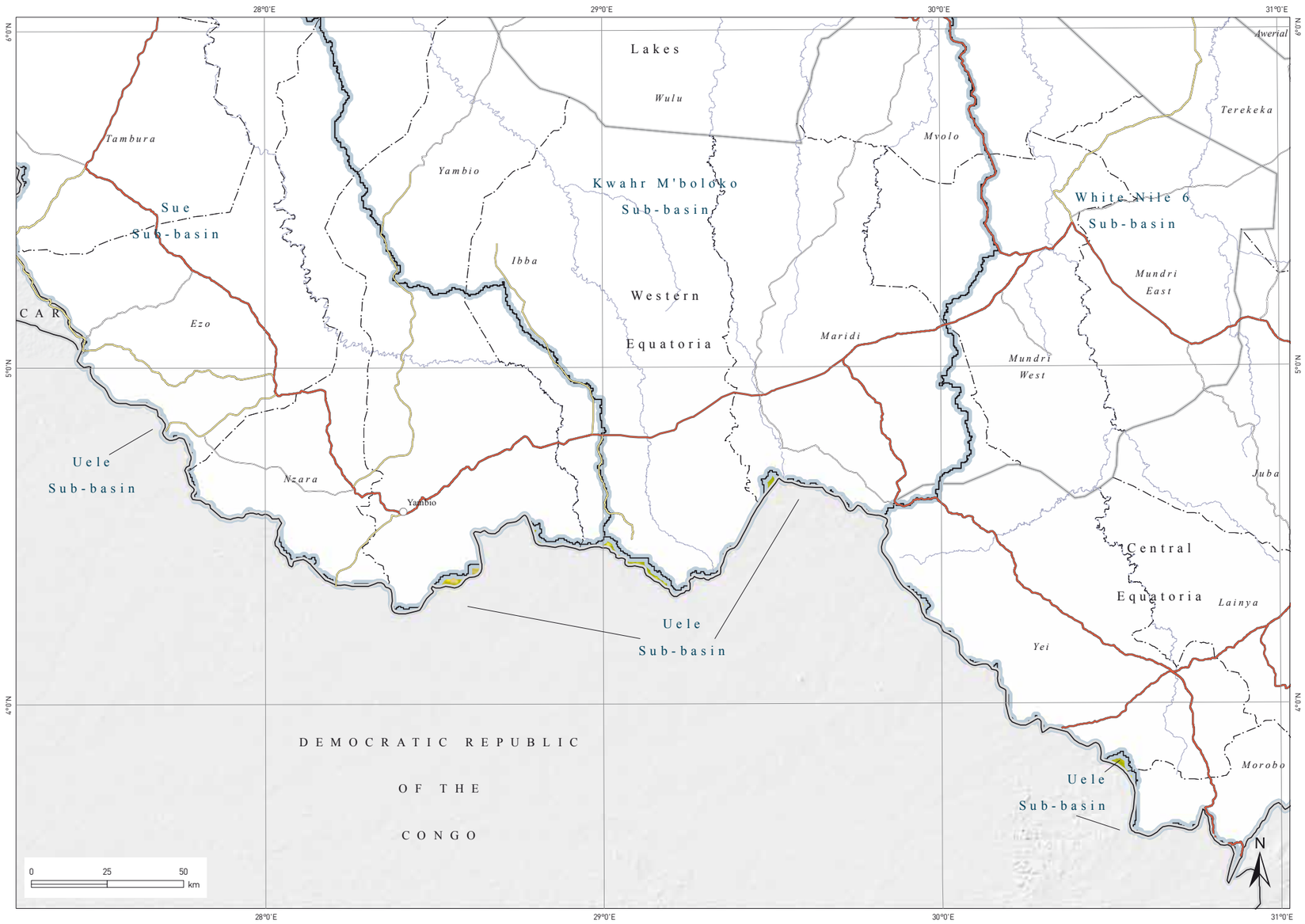






INDEX MAP

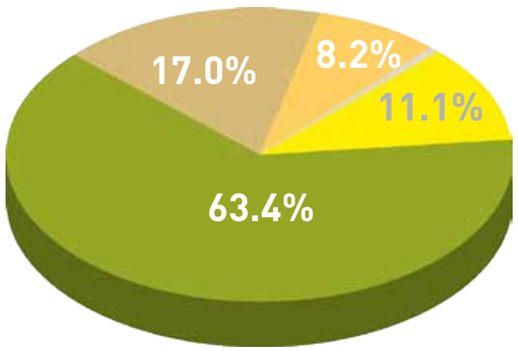




UELE

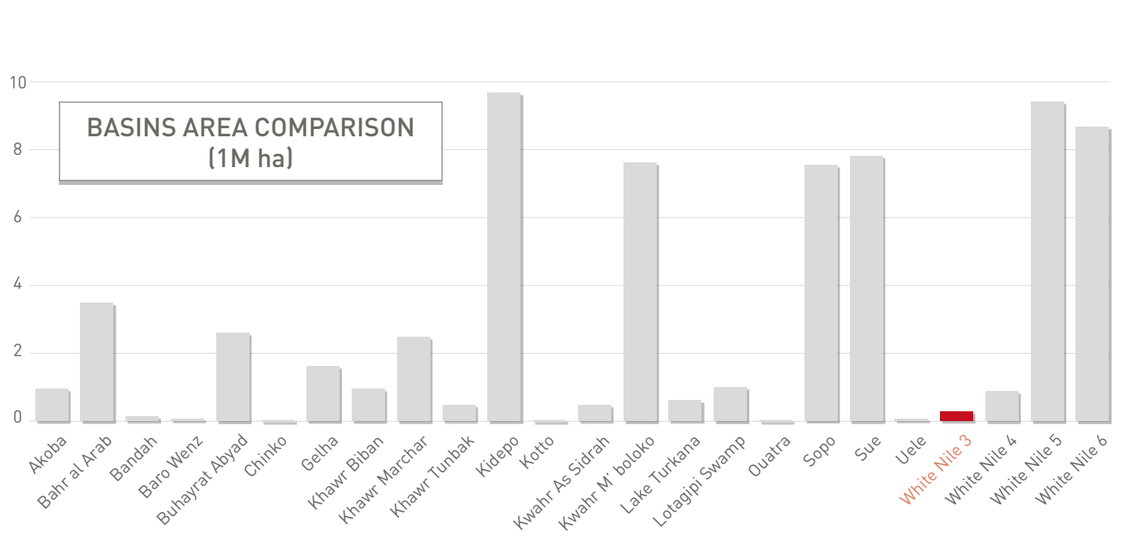
LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	5,192
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	29,774
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	7,973
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	3,854
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	150
TOTAL AREA	46,942



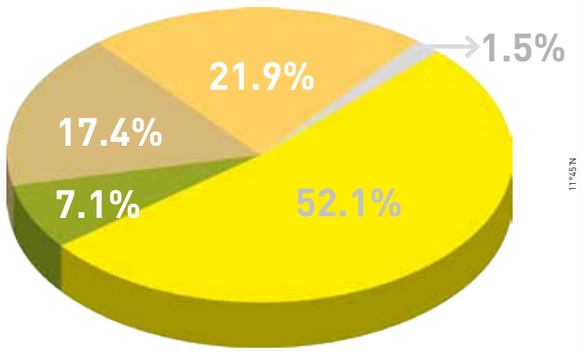
Note: Only classes representing more than 0.5 % of the area are shown in the chart

WHITE NILE 3

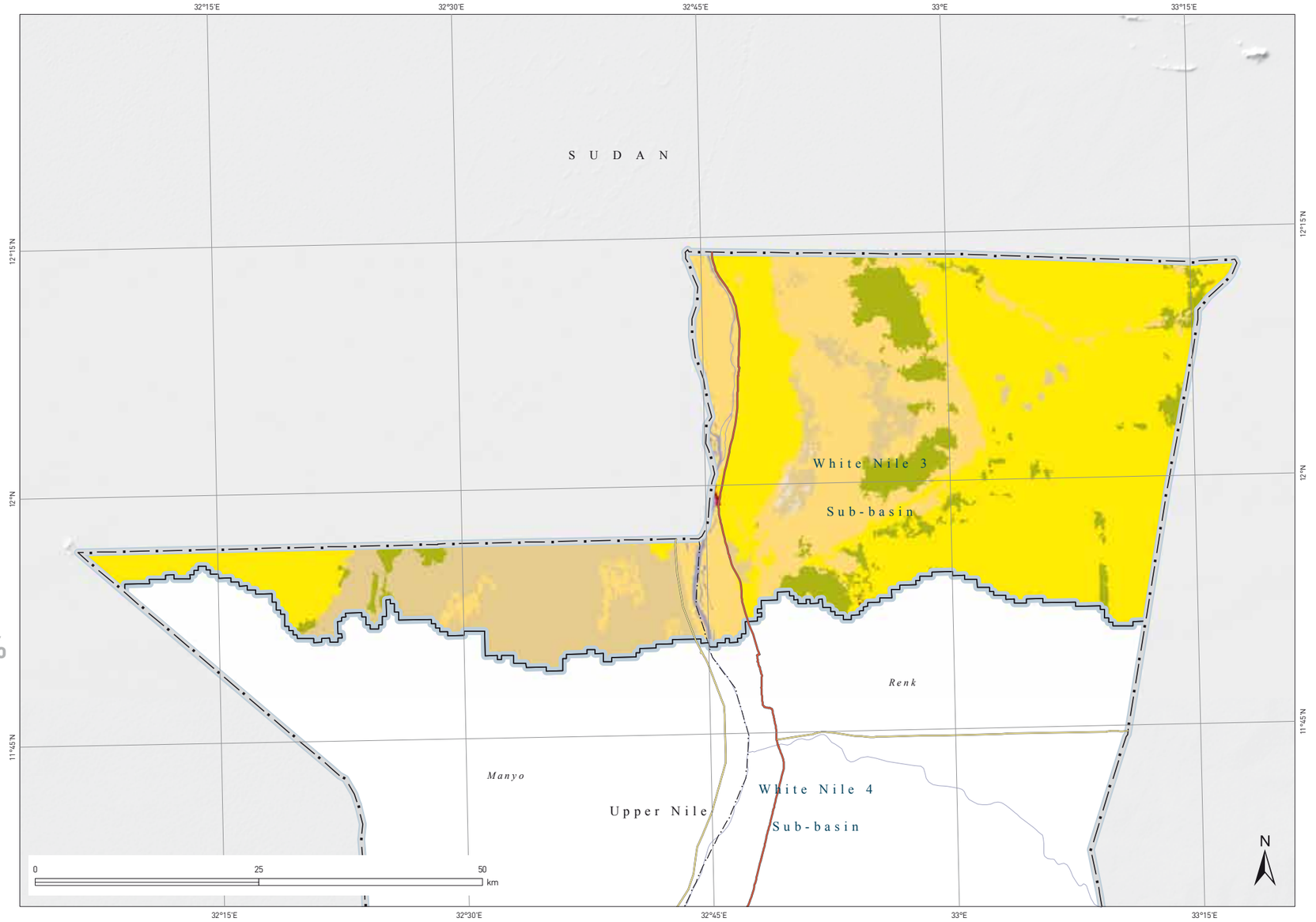


LAND COVER CLASSES IN HECTARES

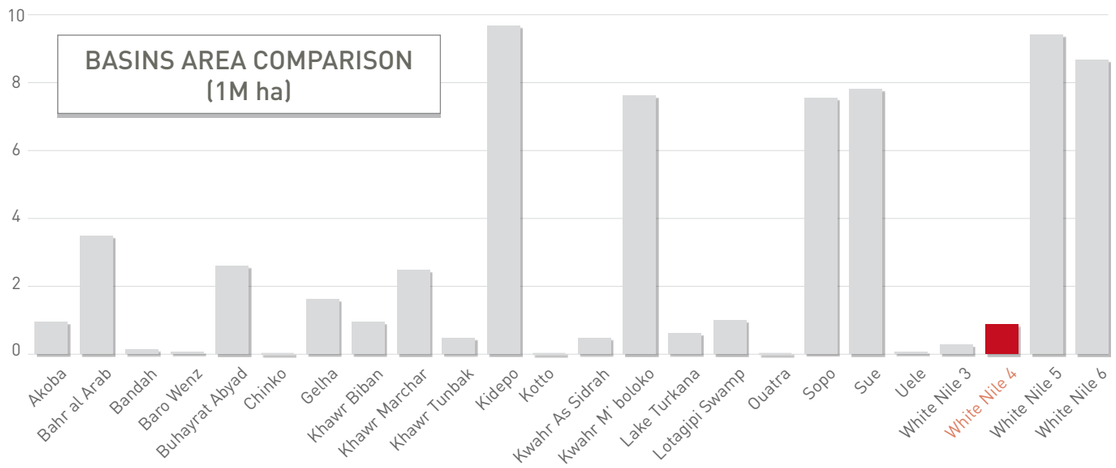
AG Agriculture in terrestrial and aquatic/regularly flooded land	139,436
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	19,055
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	46,616
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	58,676
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	3,986
TOTAL AREA	267,770

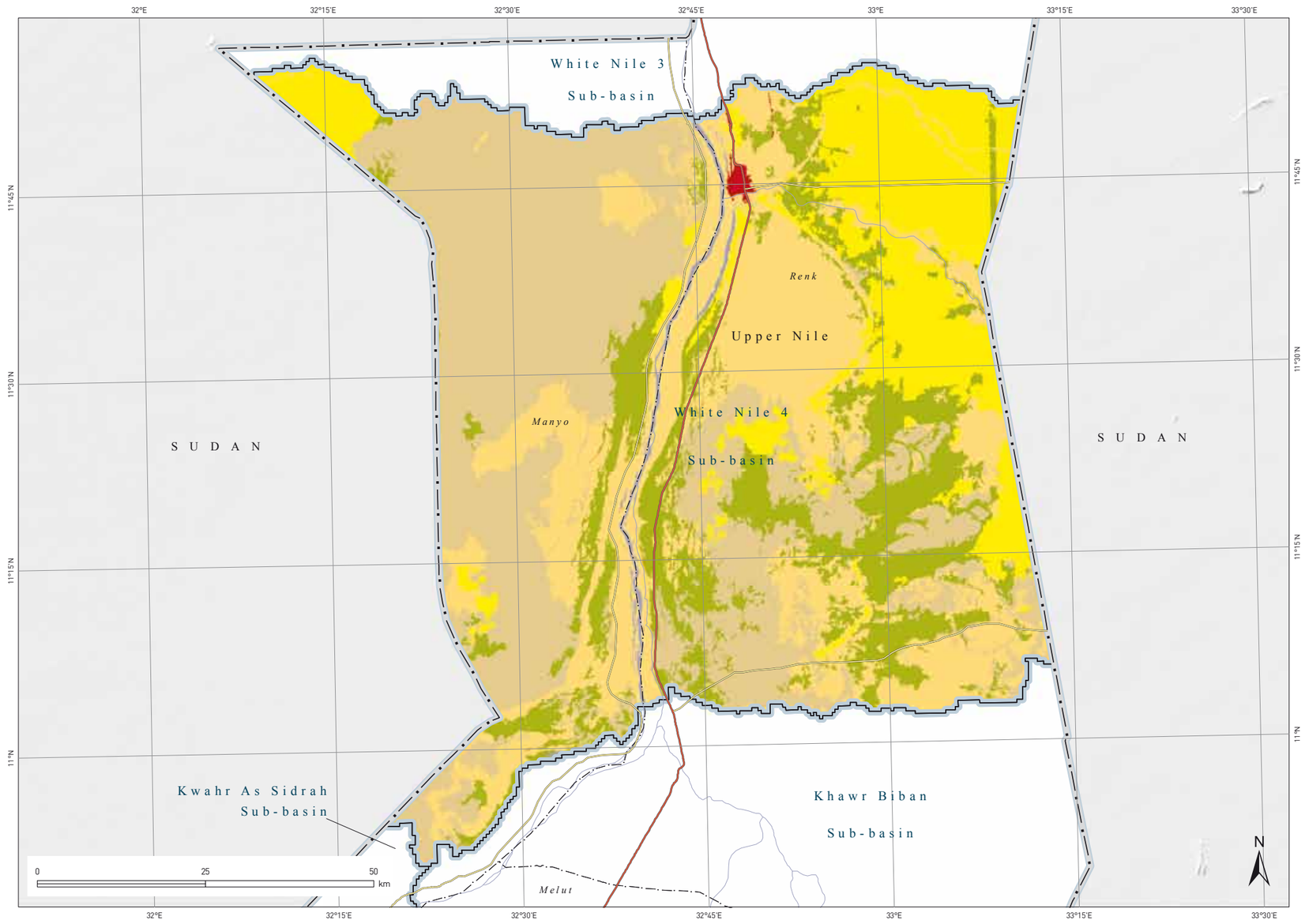


Note: Only classes representing more than 0.5 % of the area are shown in the chart



INDEX MAP

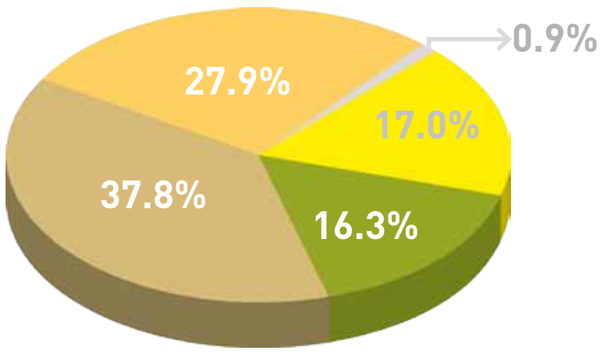




WHITE NILE 4

LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	141,341
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	135,543
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	314,598
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	232,360
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	7,861
TOTAL AREA	831,703

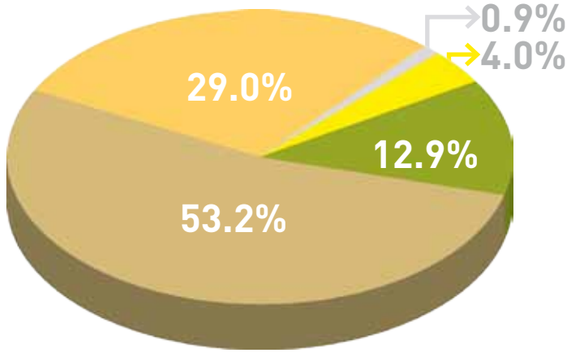


Note: Only classes representing more than 0.5 % of the area are shown in the chart

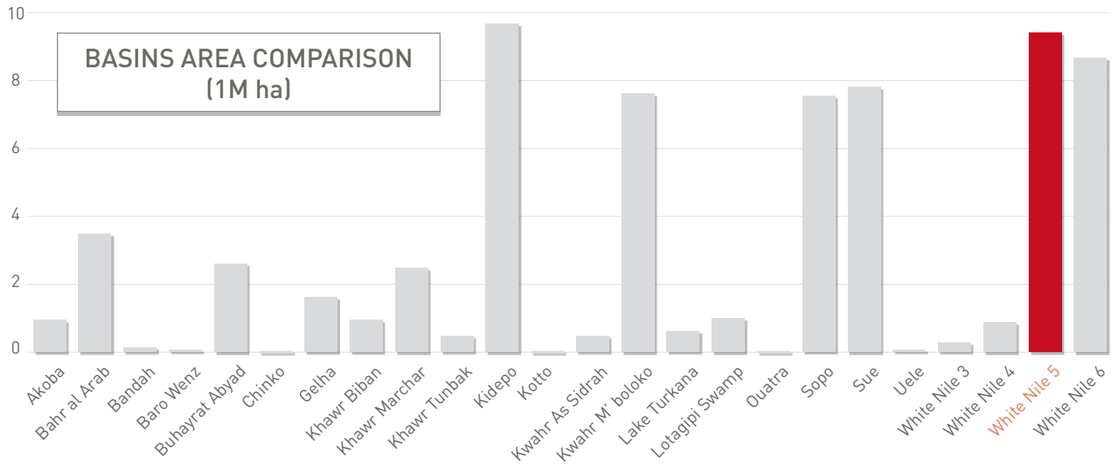
WHITE NILE 5

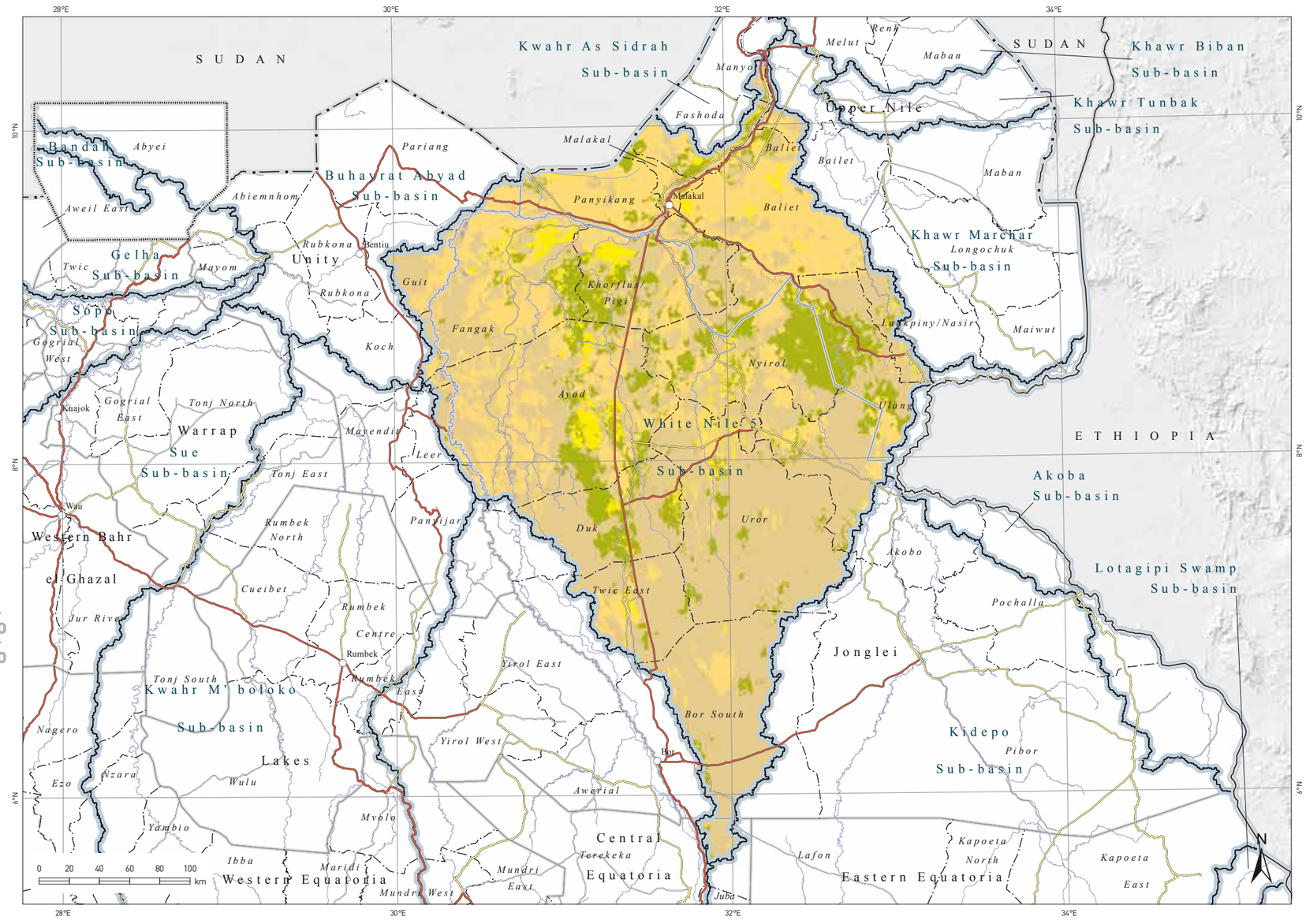
LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	373,863
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	1,193,273
SCO Shrubs closed-to-sparse in terrestrial and aquatic/ regularly flooded land	4,943,404
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/ regularly flooded land	2,695,013
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/ artificial waterbodies	80,599
TOTAL AREA	9,286,152

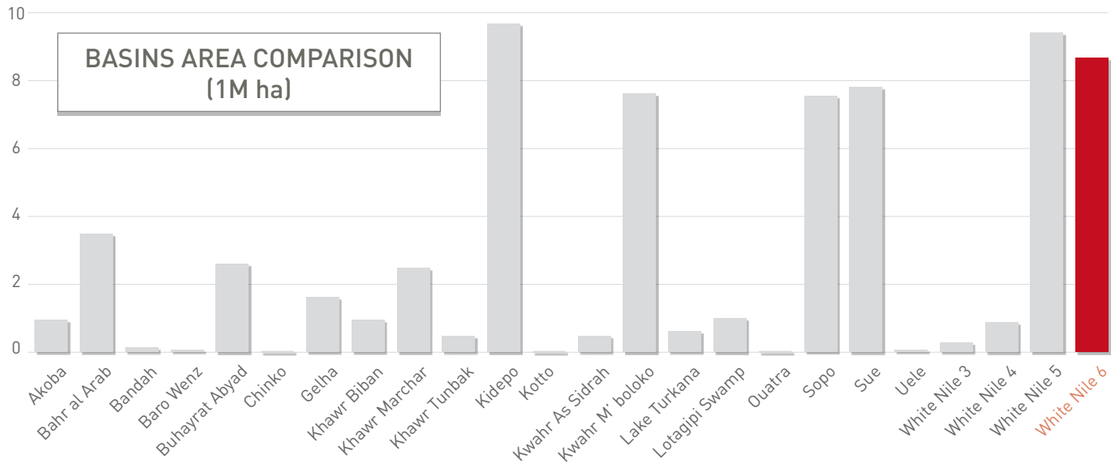


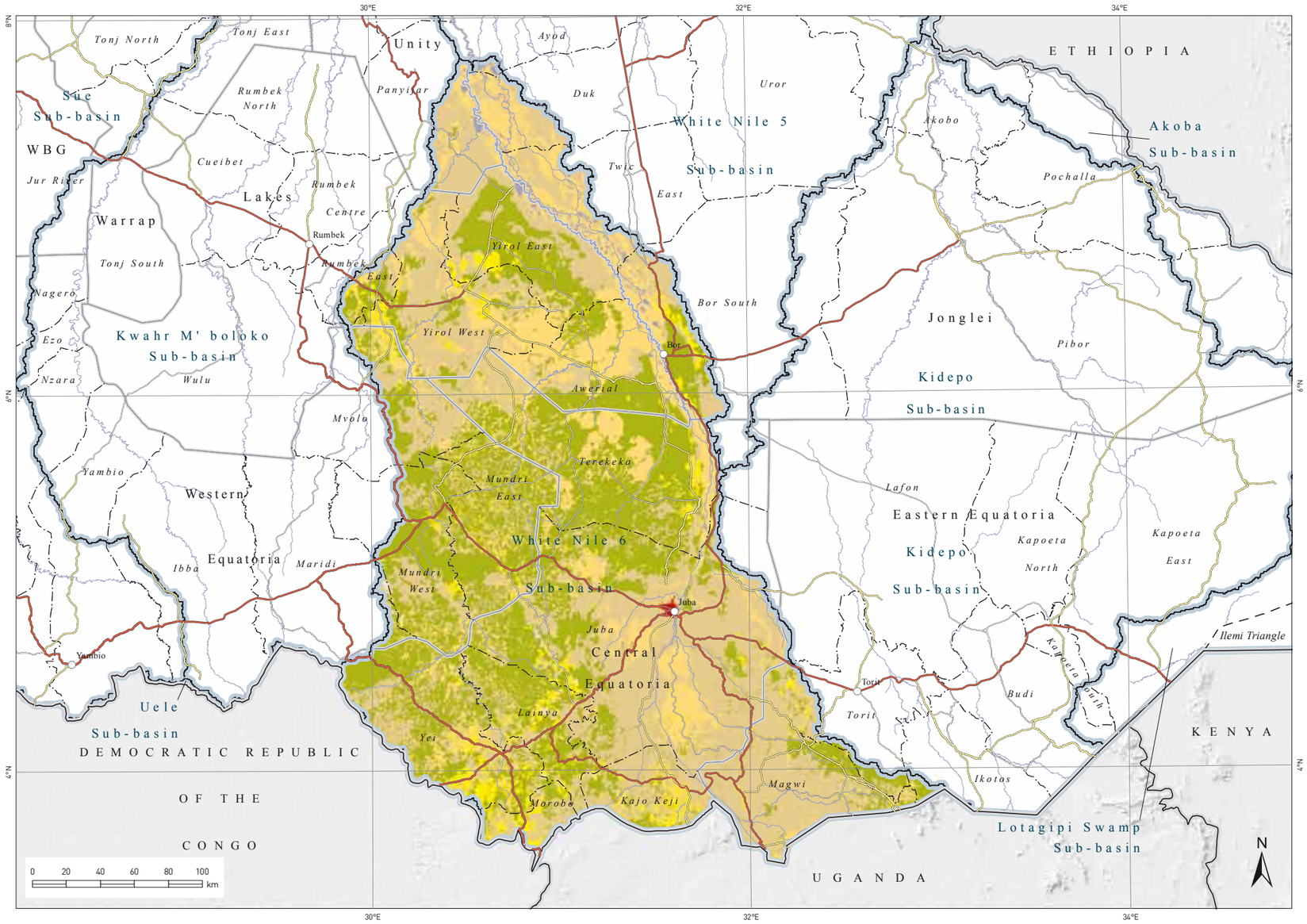
Note: Only classes representing more than 0.5 % of the area are shown in the chart





INDEX MAP

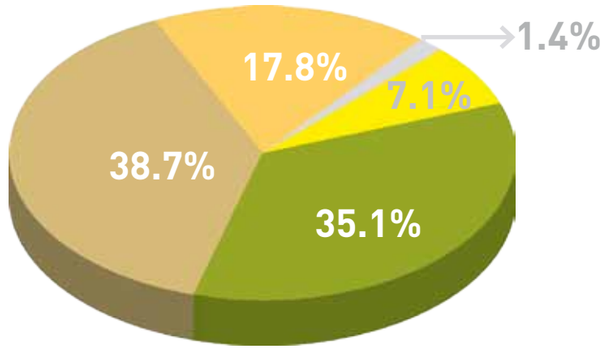




WHITE NILE 6

LAND COVER CLASSES IN HECTARES

AG Agriculture in terrestrial and aquatic/regularly flooded land	603,467
TCO Trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	2,994,750
SCO Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	3,304,616
HCO Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	1,516,394
OTHER Urban areas; Bare Rocks and Soil and/or Other Unconsolidated Material(s) & Seasonal/perennial, natural/artificial waterbodies	117,089
TOTAL AREA	8,536,316



Note: Only classes representing more than 0.5 % of the area are shown in the chart