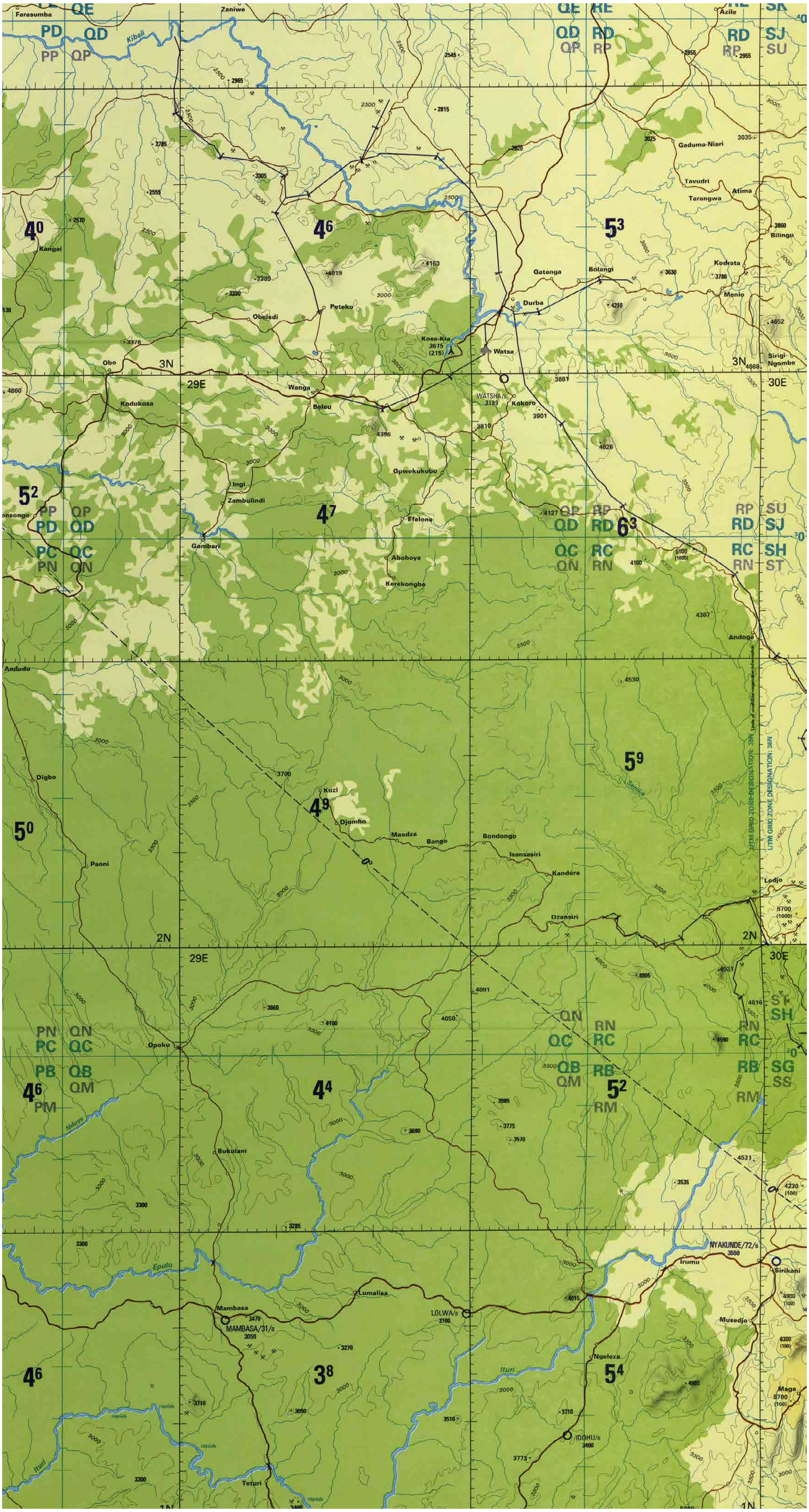
FOREST, CONGO BASIN, ITURI AND HAUT-UÉLÉ PROVINCES, MAMBASA AND WATSA CHIEFDOM, *OKAPI WILDLIFE RESERVE, KIBALI AND ITURI RIVER*



Farasumba
Zaniwe
Azile
Kibali
Gaduma-Niari
Tavudri
Tarangwa
Atima
Bilingu
Kangai
Kodrata
Menio
Gatanga
Bolangi
Durba
Obeledi
Peteko
Kose-Kia
Watsa
Sirigi-Ngombe
Obo
3N
29E
30E
Wanga
Beleu
WATSHA/s
Kokoro
Kodukosa
Gpwekukobo
Ingi
Zambulindi
Efelone
Gombari
Aboboya
Kerekongbo
Andoga
Andudu
Digbo
Kuzi
Djombo
Maodza
Bango
Bondongo
Isansasiri
Kandora
Dzansiri
Paoni
Lodjo
2N
Opoku
Bukulani
Nduye
Epulu
Mambasa
MAMBASA/31/s
Lumalisa
LOLWA/s
NYAKUNDE/72/s
Irumu
Sirikani
Musedjo
Ngeleza
Ituri
IDOHU/s
Maga
Teturi
1N
UTM GRID ZONE DESIGNATION: 35N
UTM GRID ZONE DESIGNATION: 36N

BOUNDING BOX

Coordinates System *EPSG:4326*
WGS 84 -- WGS84 - World Geodetic System 1984, used in GPS
https://epsg.io/4326

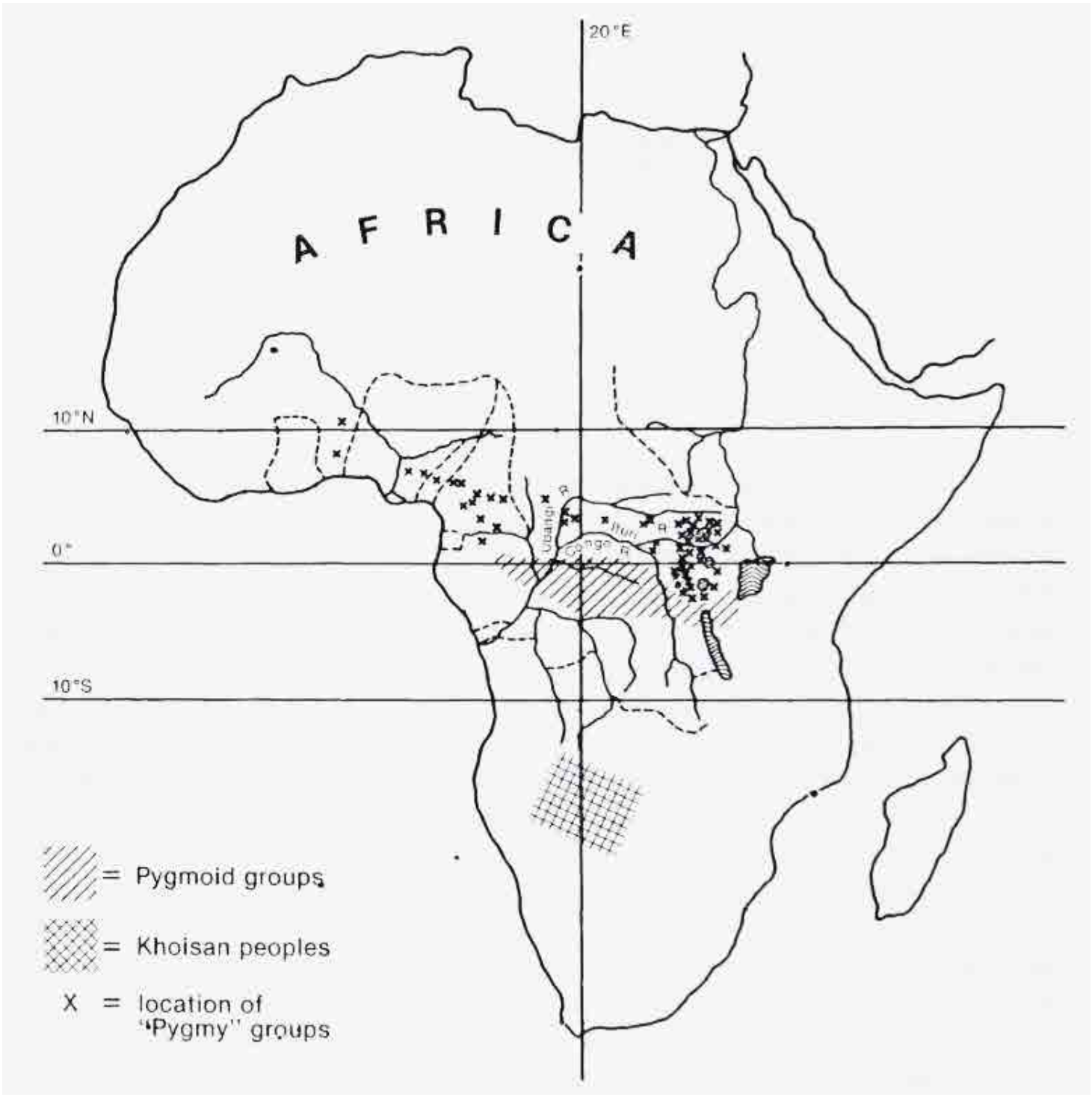
POLYGON((
31.34
2.29,
29.79
3.85,
27.55
1.50,
29.17
-0.06,
31.34
2.29
))

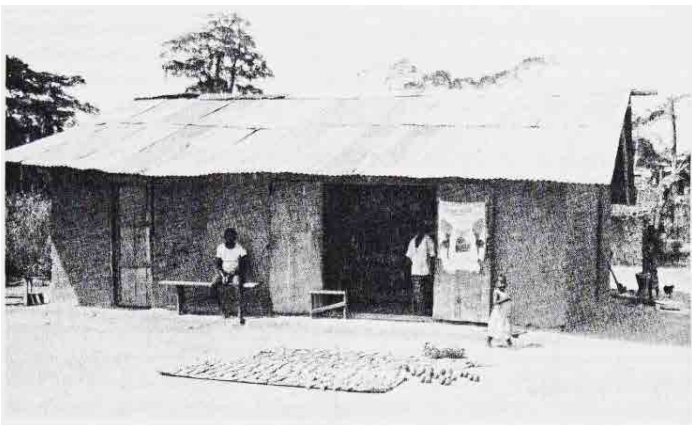
WELL-KNOWN TEXT (WKT) STRING

*Download the bounding box (.*WKT, .*geojson, .*KML)*
https://github.com/lsnmst/cartorituals/tree/main/mapping-empty-space/forest

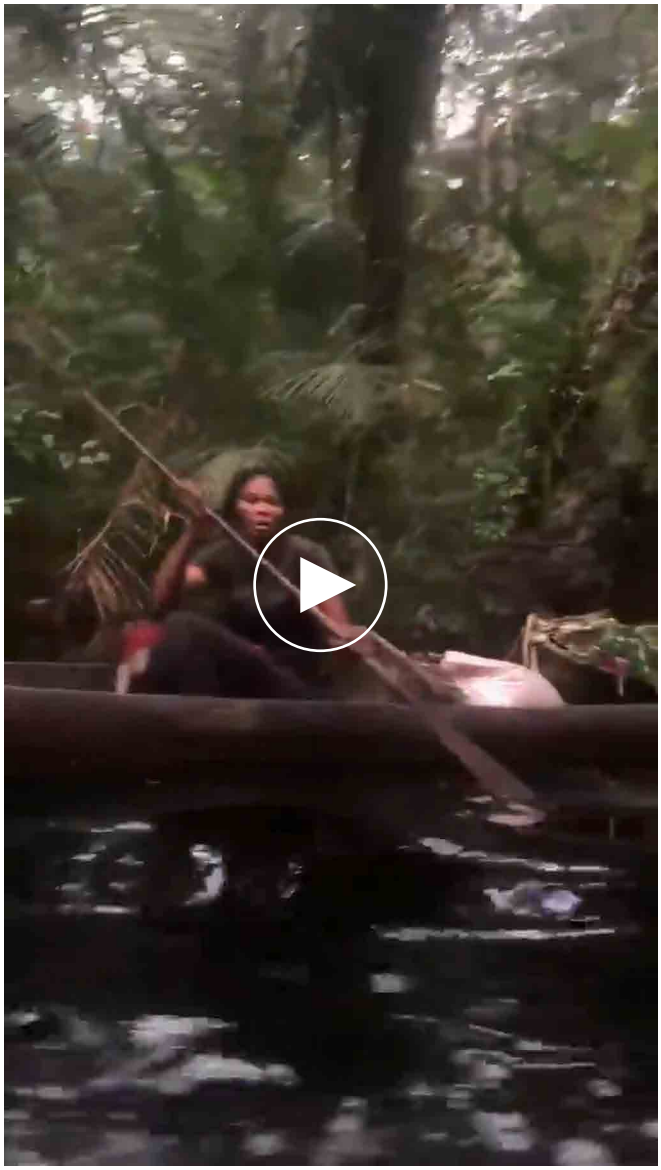
TROPICAL FOREST, THE OLDEST DOMESTICATED ECOLOGY ON THE PLANET (AT LEAST 40,000 YEARS OLD)

Mbuti People' shelter in the Ituri primary forests. Mbuti co-exist in the Ituri forest with groups of nomadic people. The Efe occupy the northern and northeatern parts of the forest. Along with them, the less populous hunter-gatherer groups known as Aka and Sua

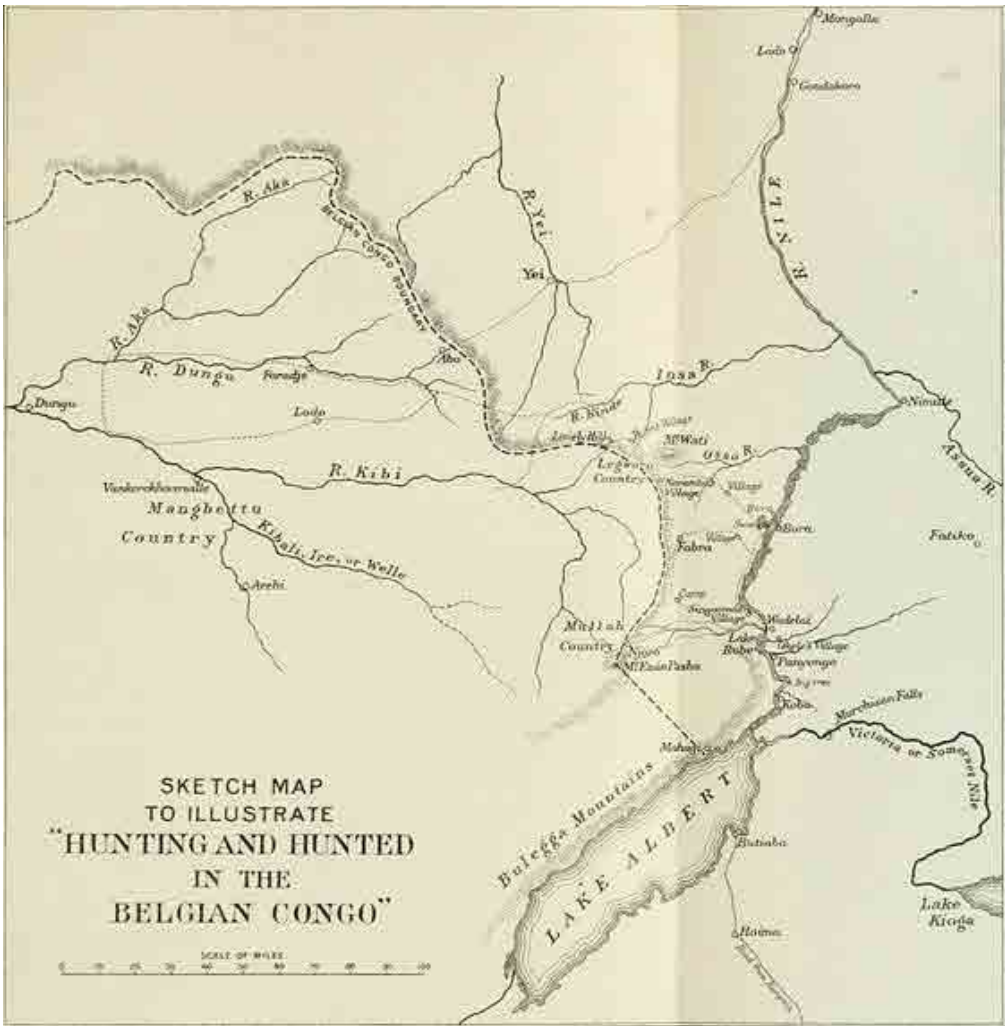




The complexity of nomadism in the forest-village system, social relations in hunting camps and in the plantations with traditional communities



(VIDEO) An entrenched system of waterways



Cooper R (1914), Hunting and Hunted in the Belgian Congo.
A map demonstrating the proximity of the Nile basins and those of the Kibali and Dungo rivers (tributaries of the Congo River). This physical geography has favoured migration and coexistence between the four main African ethnolinguistic groups (Pygmies, Bantu, Sudanese, Nilotic)

STARTING A COLLECTION AND BIBLIOGRAPHY FOR THE **CONGO BASIN FOREST** (ON BASIC NEEDS AND RIGHTS)

When you find  *it means that there is data available*

AGROFORESTRY, SUBSISTENCE FARMING, PLANTATIONS AND MONOCULTURE IN THE SAVANNAH-FOREST MOSAIC ECOTONE

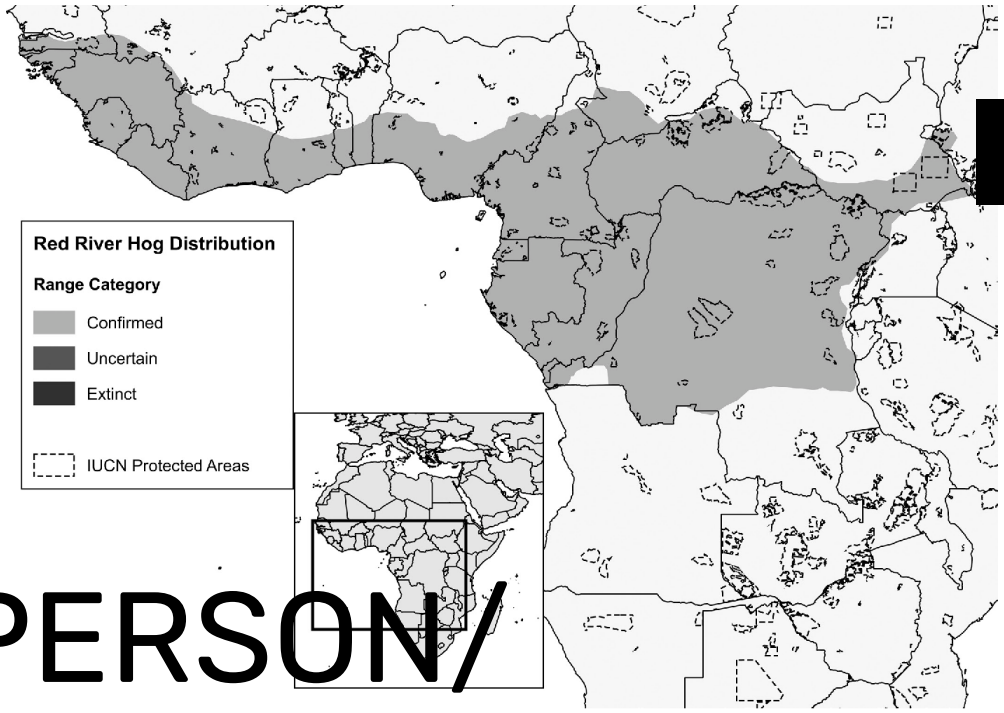
Picture from Adam Cassinga (2023)

A THOUSAND-YEAR-OLD DOMESTICATION OF WILD FRUIT PLANTS. *IRVINGIA ROBUR* (EBUTE), AMONG THE FAVOURED BY INDIGENOUS

Open fruit with fresh kernel of Irvingia robur

	Vernacular name	Scientific name
a)	Tuber & Root	
	tumba	*Dioscorea baya* (Dioscoreaceae)
	konjo	*D. bulbifera* (Dioscoreaceae)
	aduaka	*D.* cf. *sagittifolia* (Dioscoreaceae)
	amekiki	*D. smilacifolia* (Dioscoreaceae))
	ekoko	*D. smilacifolia* (Dioscoreaceae)
	etaba	*D. smilacifolia* (Dioscoreaceae)
	amakalukpe	*D.* sp. (Dioscoreaceae)
	kisombi	*Ipomoea chrisochaeta* (Convolvulaceae)
	amanjiapi*	?
	amapayeiye*	?
	bekuku*	?
b)	Seed & Nut	
	ekele	*Balanites wilsoniana* (Balanitaceae)
	kene	*Celtis adolphi-friderici* (Ulmaceae)
	[illegible]bala pala	*Chrysophyllum delevoyi* (Sapotaceae)
	[illegible]ko	*Cola acuminata* (Sterculiaceae)
	[illegible]suli	*Desplatzia dewevrei* (Tiliaceae)
	[illegible]nbau	*Gilbertiodendron dewevrei* (Leguminosae, Caesalpinioideae)
	esele	*Irvingia gabonensis* (Ixonanthaceae)
	ebute	*I. robur* (Ixonanthaceae)
	engango*	*Pancovia harmusiana* (Sapindaceae)
	sesemu	*P. laurentii* (Sapindaceae)
	songo	*Ricinodendron heudelotii* (Euphorbiaceae)
	pusia	*Treculia africana* (Moraceae)
	esenge or esengeli	?
	hou	?
	ngilesu or bangelesu	?
	njee	?
	pumbu	?
	tobye*	?
	[illegible], [illegible]olo, [illegible] tubi	?
c)	[illegible]uit & [illegible]ry	
	n[illegible]amoa	*Aframomum stipulatum* (Zingiberaceae)
	e[illegible]mbu	*Annonidium mannii* (Annonaceae)
	mbe	*Canarium schweinfurthii* (Burseraceae)
	toko	*Cola lateritia* (Sterculiaceae)
	malondo	*Dictyophleba lucida* (Apocynaceae)
	buma or abuma	*Landolphia owariensis* (Apocynaceae)
	[illegible]medede	*L. owariensis* (Apocynaceae)
	bembekenye	*Myrianthus holstii* (Moraceae)
	[illegible]kpekpe	*M. prousii* (Moraceae)
	[illegible]mbombo	*M.* sp. (Moraceae)
	akale	*Orthopichonia lacourtiana* (Apocynaceae)
	abeka	*Piper guineense* (Piperaceae)
	sana	*Pseudospondias microcarpa* (Anacardiaceae)
	ekoko	*Renealmia africana* (Zingiberaceae)
	amanbunonbuno	*Salacia pyriformoides* (Celastraceae)
	mgbako	*Solanum indicum* (Solanaceae)
	ngongo	*Thaumatococcus daniellii* (Marantaceae)
	bukanbanda*	?
	elinda	?
	ngamo*	?
d)	Leaf	
	atete	*Amaranthus dubius* (Amaranthaceae)
	kpedekpede	*A. tricolor* (Amaranthaceae)
	njombo	*Momordica foetida* (Cucurbitaceae)
	ngoua	*Solanum nigrum* (Solanaceae)
	asede or alaka	?

Tanno T (1981) Plant Utilization of the Mbuti Pygmies: With Special Reference to Their Material Culture and Use of Wild Vegetable Foods



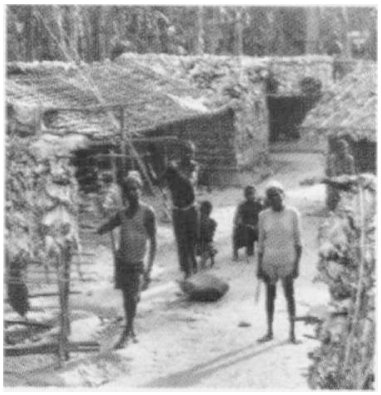
Distribution of the Red River Hot Potamochoerus porcus, a species hunted in the forests of the Ituri and traded with villagers who bring it to the city

40 KG/PERSON/ YEAR OF BUSHMEAT. * EMPTY FORESTS, EMPTY STOMACHS?

* *Indigeous People depend upon the villagers' farms products for the bulk of their vegetable foods, which they acquire in exchange for game meat, by offering their labour to the villagers or by providing forest products the villagers need*

[Nasi R, Taber A, Van Vliet N (2011), Empty forests, empty stomachs? Bushmeat and livelihoods in the Congo and Amazon Basins]

[Bushmeat consumption among rural and urban children from Province Orientale, Democratic Republic of Congo]



Picture of an Mbuti autonomous village community in the Ituri forest taken after the appearance of the European (wuzungu)

CASSAVA, A KEY SUBSISTENCE SPECIES GROWN IN THE VILLAGE'S SEASONAL GARDENS

Terashima H, Ichikawa, M (2003), A comparative ethnobotany of the Mbuti and Efe hunter-gatherers in the Ituri forest, Democratic Republic of Congo

Marivoet, W, Ulimwengu, J, Salam el Vilaly, M A (2018), Understanding the Democratic Republic of the Congo's agricultural paradox

THE MOST DEBATED AGRICULTURAL PRACTICE: SWIDDEN OR SLASH-AND-BURN AGRICULTURE

In DRC, 63 percent of tree cover loss detected between 2000 and 2015 occurred within the rural complex (black-prior 2000, grey-up to 2005 and white-up to 2010), meaning it was caused by shifting cultivation rather than expansion into forests, which accounted for 13 percent of tree cover loss.

Tanzito G, Ibanda P A, Talaguma R, Lusanga N M (2020) Slash-and-burn agriculture, the major cropping system in the region of Faradje in Democratic Republic of Congo: Ecological and socio-economic consequences

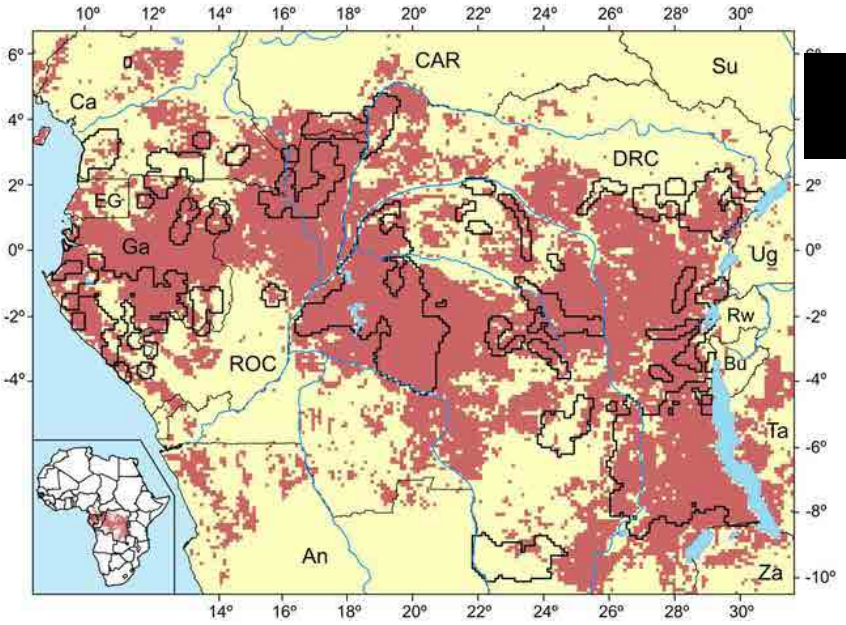
New Map Helps Distinguish Between Cyclical Farming and Deforestation in the Congo Basin

FOREST-VILLAGE DYNAMICS. AN EXAMPLE OF COEXISTENCE BETWEEN THE FORAGERS *EFE* PEOPLE AND THEIR NEIGHBOURING FARMERS *LESE* PEOPLE

Before completing his house (right) a Lese man's Efe wife builds them a makeshift Efe hut. Picture taken in Malembi, north of Mambasa, 2° 15' 11" N 28° 47' 8" E

Grinker R R (1994), Houses in the Rainforest: Ethnicity and Inequality Among Farmers and Foragers in Central Africa

NOMADIC, SEMI-NOMADIC, PERMANENT, SEASONAL



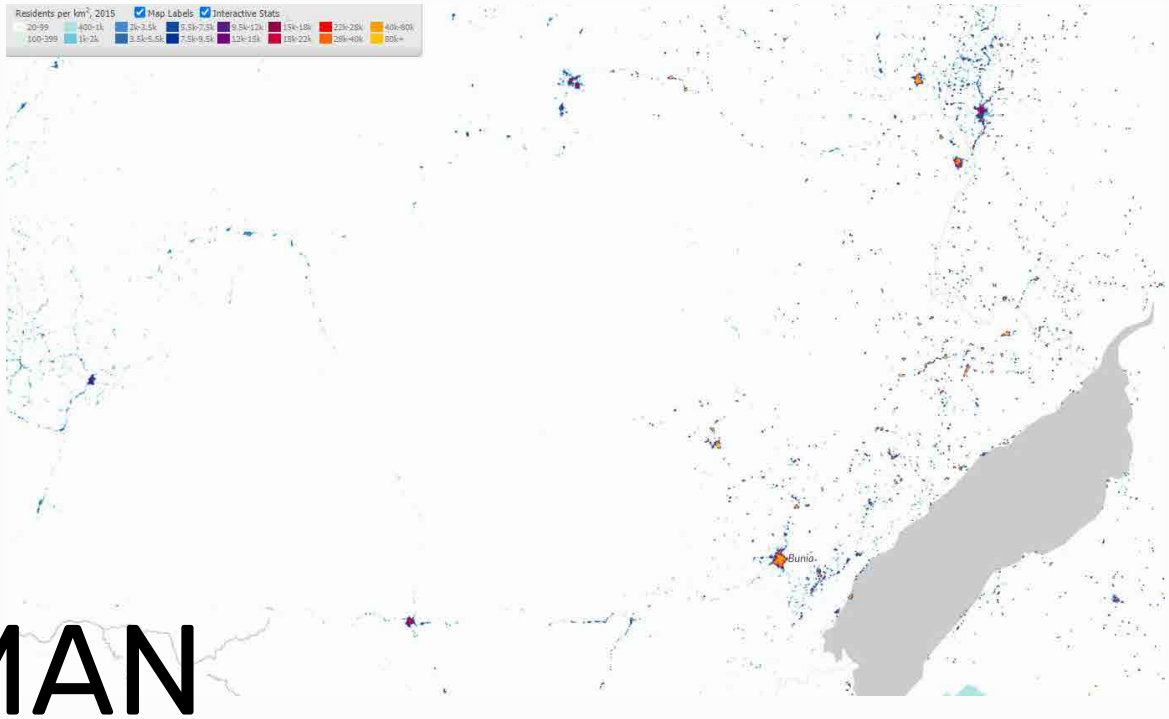
Environmental favourability model for Pygmies (spatial distribution models based on the favourability function, which distinguish areas with favourable environmental conditions from those less suitable)

WHERE REGIONS DO THE INDIGENOUS GROUPS—WHO ARE PRIMARILY SEMI-NOMADIC—MOVE?

Olivero J, et al. (2015) Distribution and Numbers of Pygmies in Central African Forests

OPEN BUILDINGS. SATELLITE-DETECTED EVIDENCES OF SETTLEMENT (OR, MULTI-TEMPORAL)

Building footprint satellite-detention of the linear settlement along the RN4 national highway crossing Okapi Reserve



HUMAN PRESENCE, INHABITANTS PER KM²

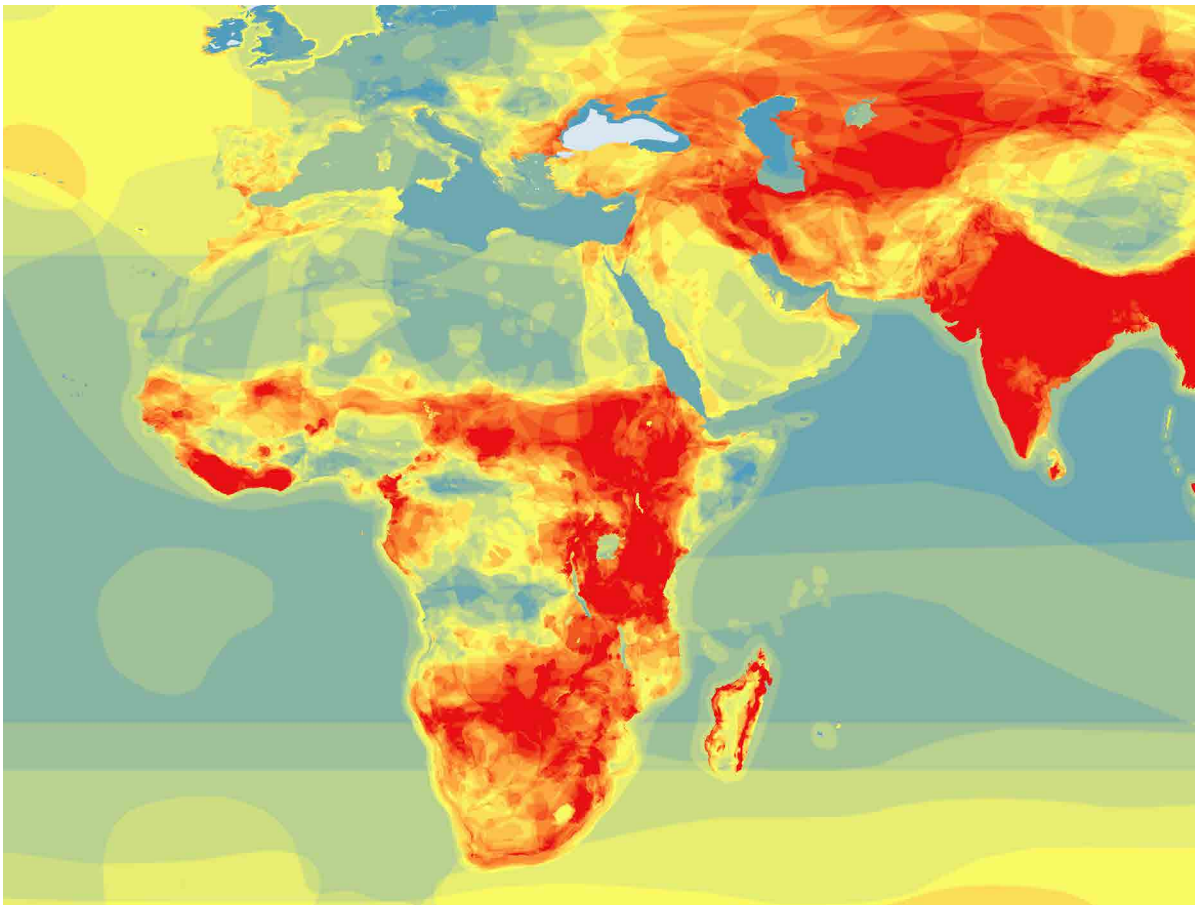
DISCONTINUOUS AQUIFERS WITH HIGH POTENTIAL. DRAW DRINKING WATER AT THE COMMUNITY FOUNTAINS, WELLS, NATURAL SPRINGS / COLLECTING RAINWATERS

Collecting water mobility: 54.2% of the population in DRC takes 30 minutes or more to access water

SPECIES RARITY: A FUNCTION OF GEOGRAPHICAL RANGE SIZE, NUMERICAL ABUNDANCE AND HABITAT SPECIALISATION

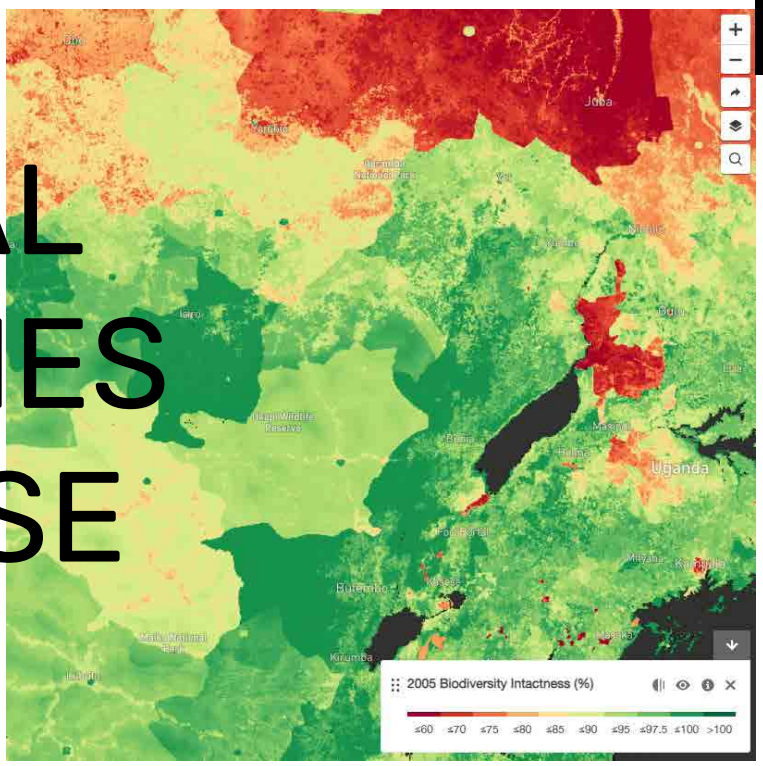
Species are considered rare if their area of occupancy or their numbers are small when compared to the other species that are taxonomically or ecologically comparable

THE NUMBER OF SPECIES IN A COMMUNITY: RICHNESS



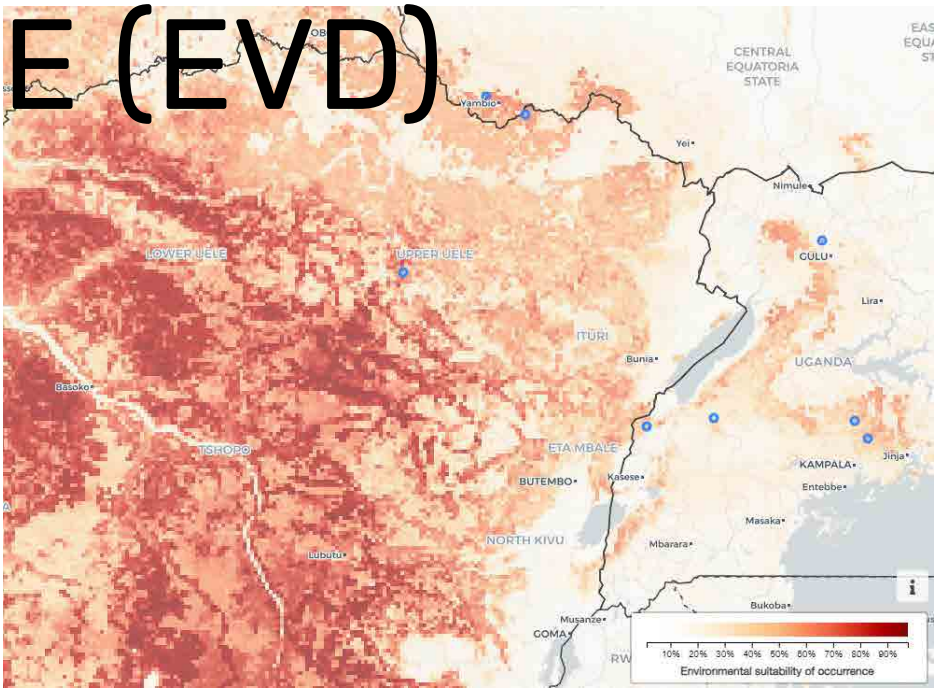
The Biodiversity Intactness Index estimated percentage of the original number of species that remain and their abundance in any given area, despite human impacts.

CHANGE IN ECOLOGICAL COMMUNITIES IN RESPONSE TO HUMAN PRESSURES: BIODIVERSITY INTACTNESS



THREATS POSED BY ZOONOSES. OUTBREAKS OF EBOLA VIRUS DISEASE (EVD)

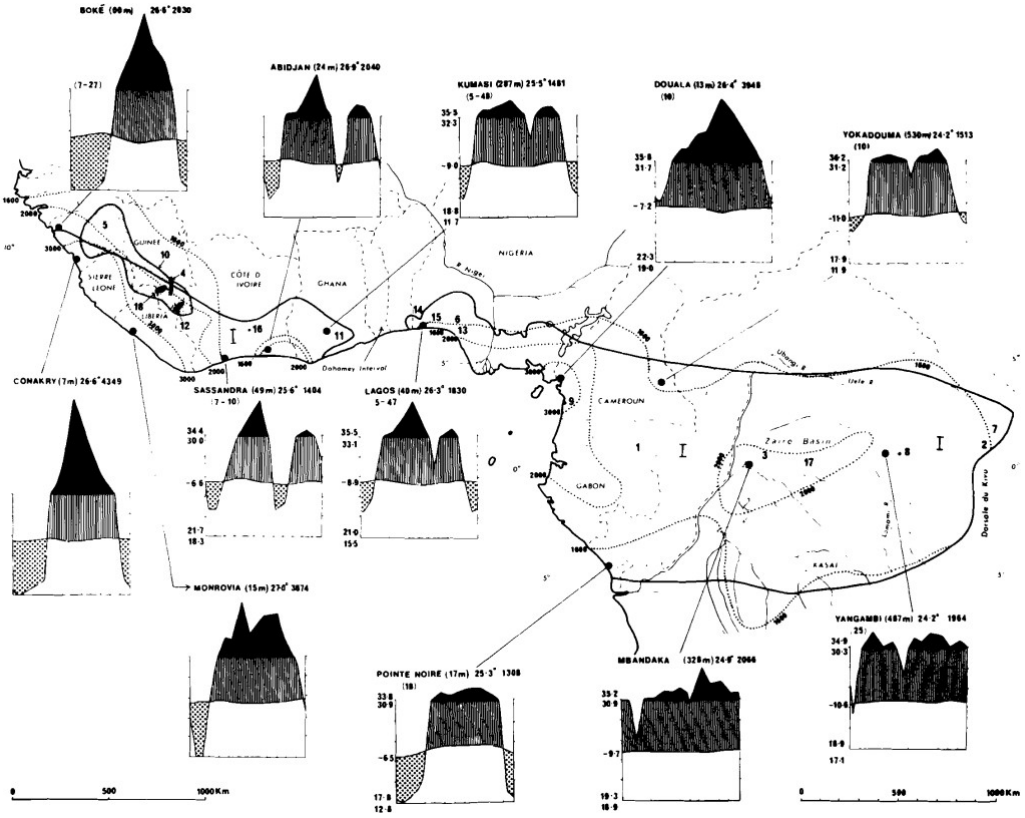
Based on species distribution models and environmental covariates, the EVD zoonotic niche map predicts the geographic extent of the zoonotic transmission niche.



SWAHILI AND LINGALA 💻 MOST WIDELY USED LANGUAGES, THEN THE MINORITIES ALUR 💻 , BILA 💻 , MANGBUTU 💻 , NYALI 💻 , BENDI 💻 , MANGBETU 💻 , MAMVU 💻 , LESE 💻 , DONGO 💻 , KEBU 💻 , LENDU 💻

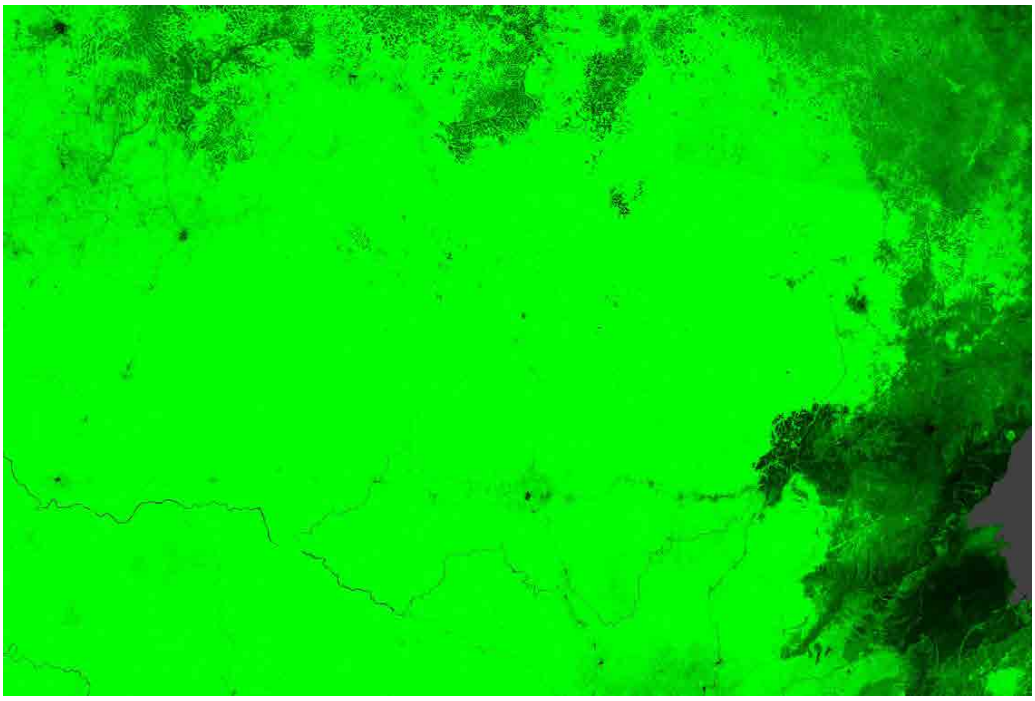
SECTIONS

ELEVATION MODEL 30M (OR, EITHER 30M)

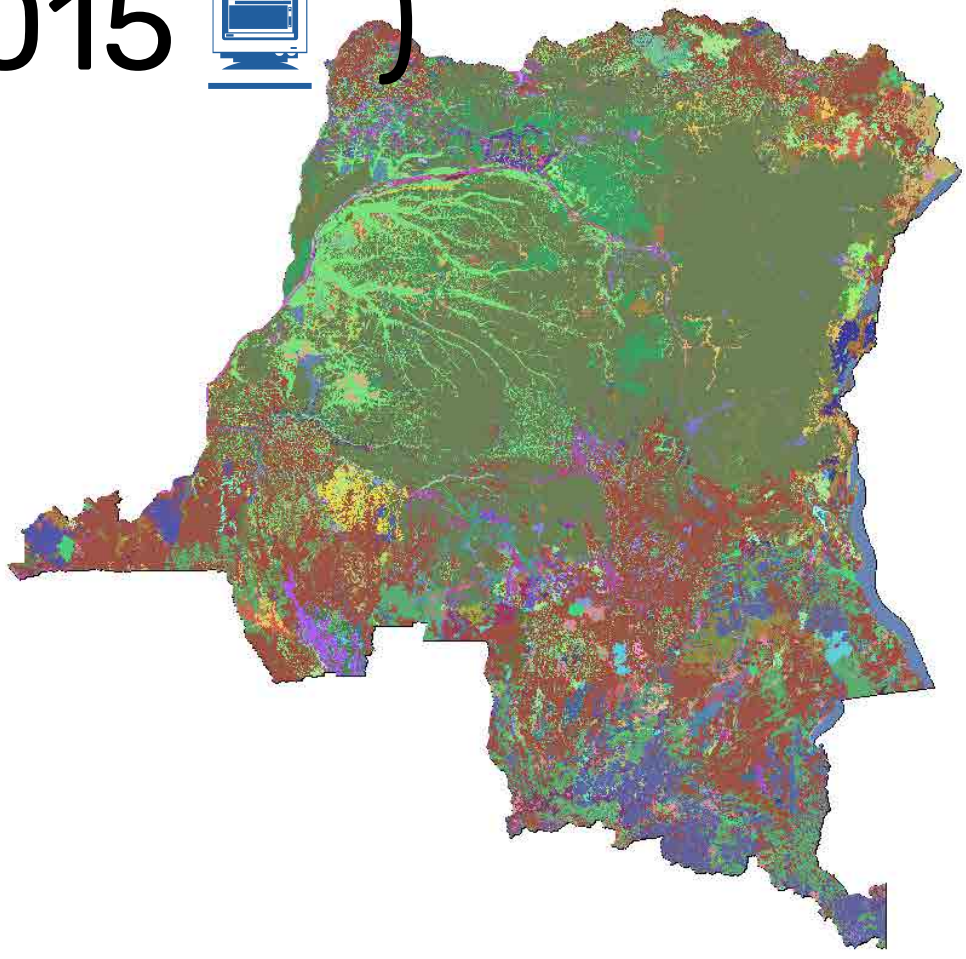


CAN YOU SEE THE SKY WHILE IN THE FOREST? HOW MUCH THE CANOPIES ARE CLOSED

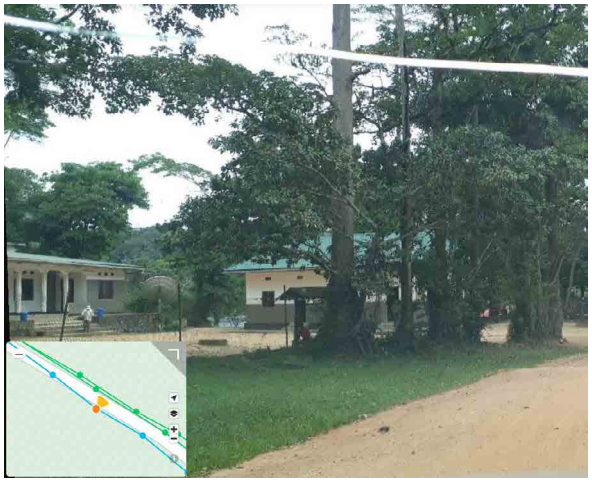
Tree cover in the Ituri province, year 2000, defined as canopy closure for all vegetation taller than 5m in height. Encoded as a percentage per output grid cell, in the range 0–100



THE (BIO) PHYSICAL COVER (YEAR 2003 , YEAR 2015)



MAMBASA, EPULU, WATSA. WHERE TELCOMS ANTENNAS ARE LOCATED



Epulu antenna captured by Mapillary users at the Institut Congolais pour la Conservation de la Nature (ICCN) centre 1°24'04"N 28°34'38"E

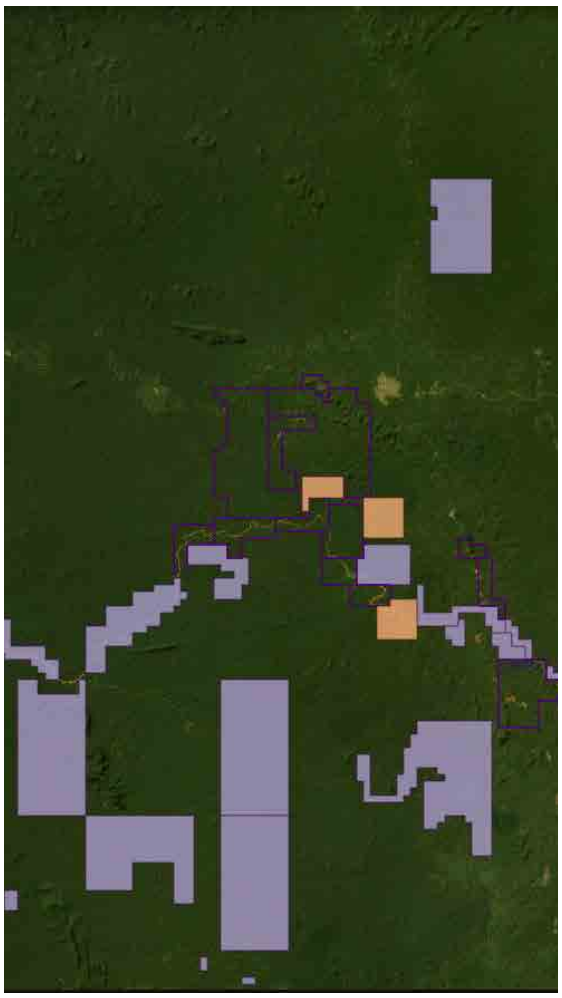
Prospectors at the mine sites occasionally recruit pygmies to deliver water and rocks that will be crushed and washed.

THE GOLD RUSH THAT COMPELLED FOREST PEOPLE TO CHANGE THEIR LIVELIHOODS. ARTISANAL (ILLEGAL) MINING IN DENSE FOREST AREAS

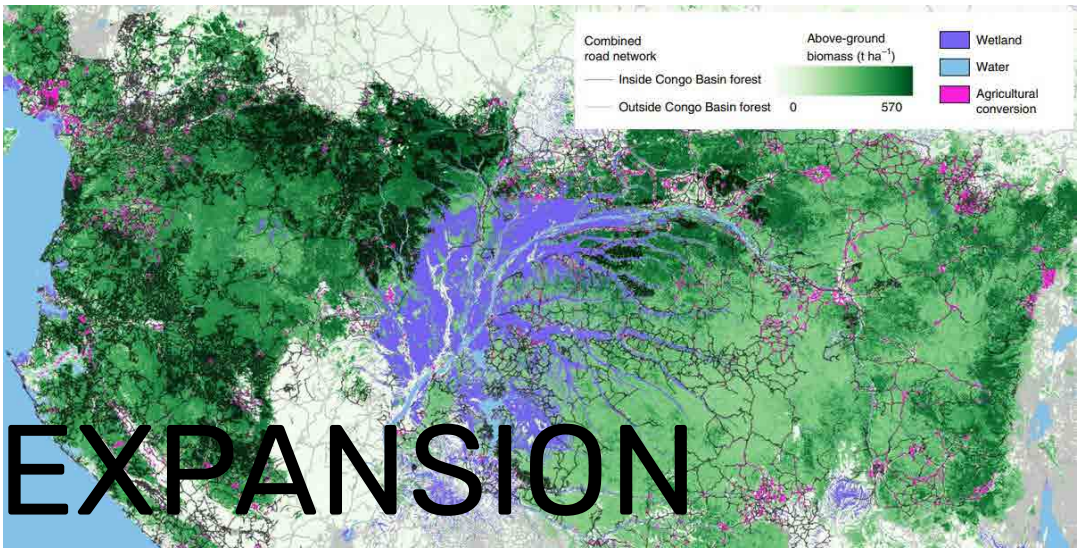
Okapi Wildlife Reserve: Illegal Sourcing of Gold and Timber (2018)

Le fleuve d'or: the production and trade of gold from Mongbwalu, DRC

REVEALING THE ABUNDANCE OF UNDERGROUND RESOURCES BY CONSIDERING THE PERMITS ISSUED IN THE MINING CADASTRE



POLITICAL ECOLOGY



ROAD EXPANSION IN FORESTS OF THE CONGO BASIN. HABITAT DISRUPTION, LIVELIHOOD SHIFTING, AND AUTONOMY LOSS

Kleinschroth F , et Al (2019), Road expansion and persistence in forests of the Congo Basin

FROM CLIMATE CHANGE TO AGRICULTURAL LAND CONVERSION TO ILLEGAL MINING AND LOGGING. GROSS FOREST COVER LOSS AND NEAR-REAL TIME TRACKING

In blue are shown the GLAD deforestation alerts recorded since January 2023 in the Mambasa area

GLAD Deforestation Alerts, Explained

Deforestation intensifies in northern DRC protected areas

Smoking fireplace remains photographed by Matt Reichel in an Mbuti hunting camp

FIRE ALARMS. COOKING FIRES OR FOREST CLEARING (ILLEGAL ACTIVITIES AND SWIDDEN AGRICULTURE) ?

What is the VIIRS 375 m Active Fire Product?

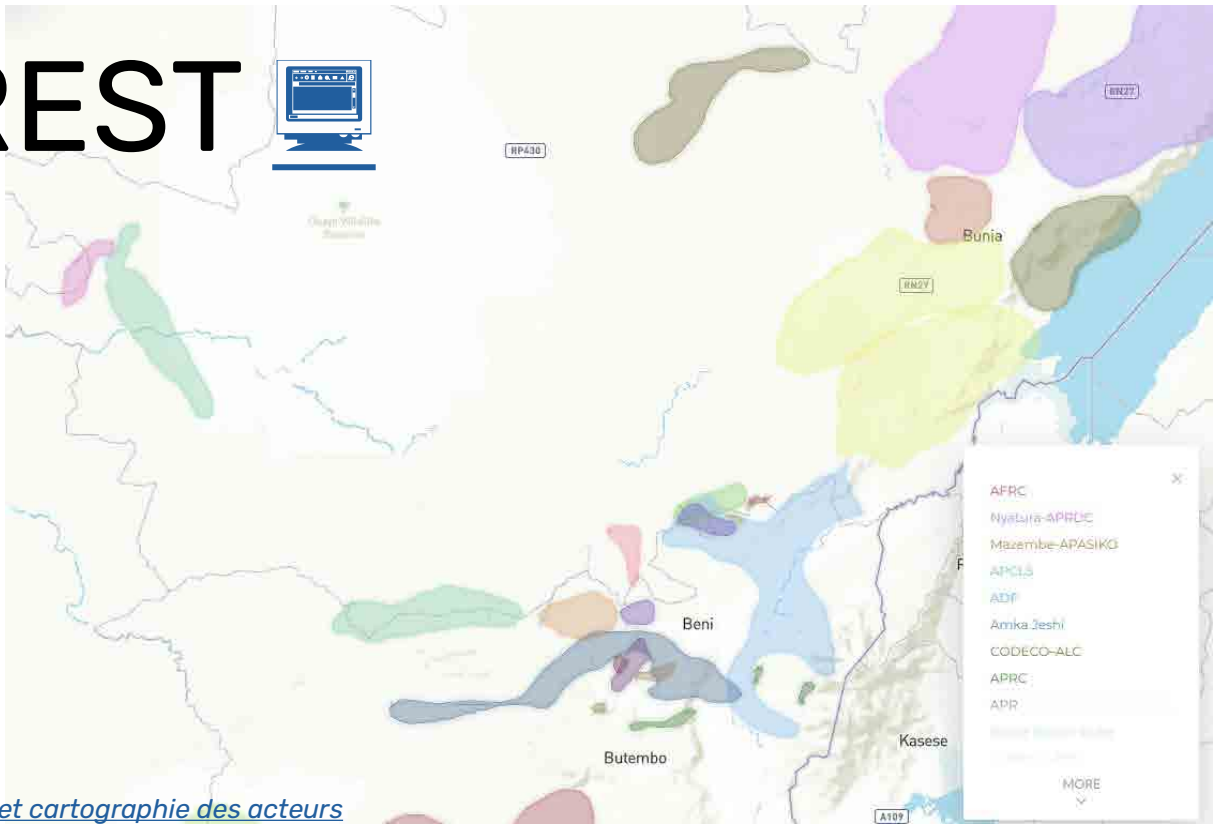
POLITICAL ECOLOGY

THE TROUBLED RELATIONSHIP BETWEEN INDIGENOUS PEOPLE AND CONSERVATION INSTITUTIONS IN THE PROTECTED AREAS. WHAT ARE THE BOUNDARIES?

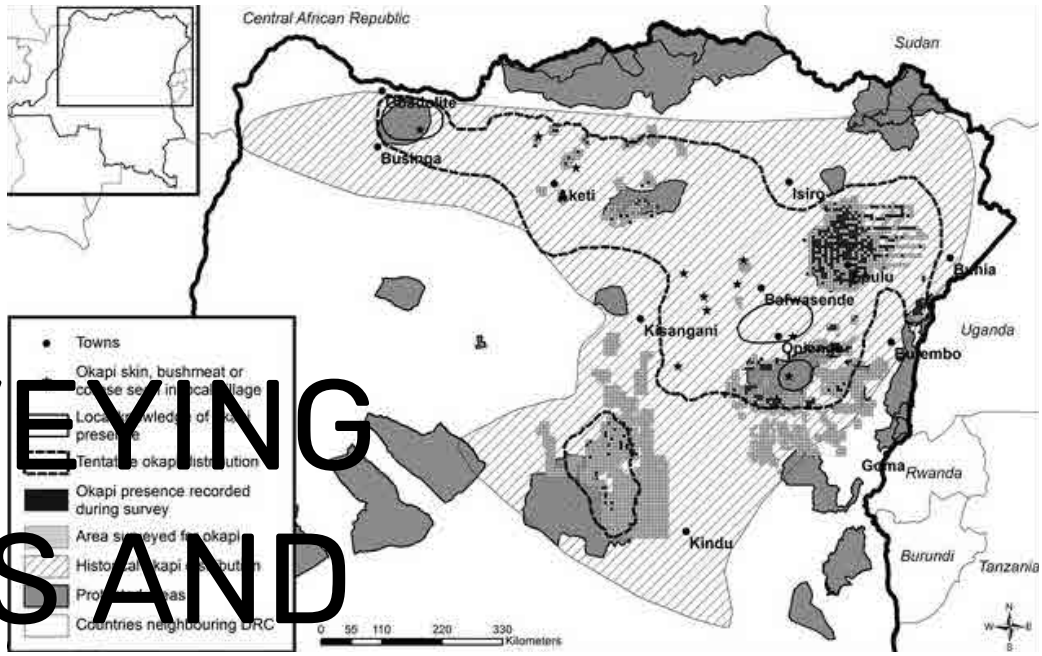
What went wrong with conservation at Kahuzi-Biega National Park and how to transform it (commentary)

CONFLICTS, HUNDREDS OF *CODECO* AND *MAI-MAI* REBELS HIDING IN THE FOREST

Kivu Security Tracker (KST) map violence by state security forces and armed groups in eastern DRC



Analyse de conflit et cartographie des acteurs dans le Sud Kivu et l'Ituri



SURVEYING PLOTS AND CUSTOMARY LANDS TO SECURE THEM AMIDST CONFLICT OVER LAND RIGHTS

UN-Habitat issues land certificates in Ituri Province in DRC

“THE SONG OF THE FOREST”, NOMADIC HUNTING AND GATHERING, RITUALS

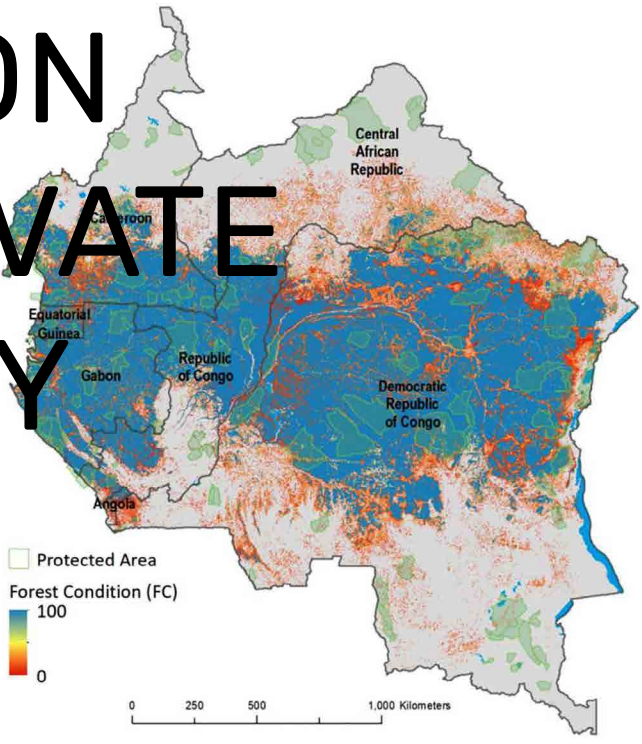
The annual circuit of three hunting camps of the Aka People pivoting on a single village (1983)

[Turnbull C M (1962), The forest people]

PRISONERS OF MUD. EASTERN PROVINCES DEPEND ON THE RIDEABILITY OF THE *RN4* HIGHWAY

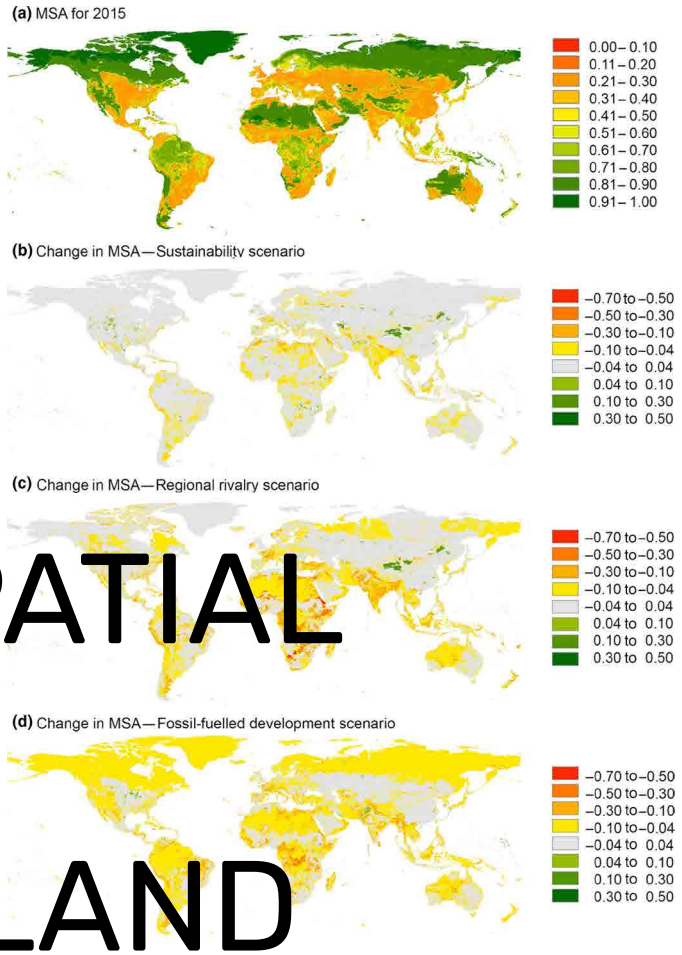
A historical image of a mud stuck convoy on the N4 national road

DETERMINING THE FOREST'S CONDITION TO MEASURE THE DEGREE OF ITS DEGRADATION AND REACTIVATE ITS CAPACITY TO PROVIDE ECOSYSTEM SERVICES



Shapiro A C, et Al. (2021), Forest condition in the Congo Basin for the assessment of ecosystem conservation status

SEASONAL CHANGES IN THE LANDSCAPE



GLOBIO4 MODEL'S SPATIAL DATASETS FORECAST LAND COVER BASED ON SEVERAL CLIMATE SCENARIOS

Projecting terrestrial biodiversity intactness with GLOBIO 4

L'ENFER AU PARADIS (HELL IN THE HEAVEN)

Congolese soldiers and Okapi park rangers accompany the bodies of those killed by rebels while guarding a defunct illegal gold mine. Picture by Adriane Ohanesian (2018)

FOREST, DRAW THE BOUNDING BOX ON A MAP

FOREST, BUILD YOUR OWN MENTAL IMAGE OF THE EMPTY PLACE USING SATELLITE IMAGES AND CRITICALLY ANALYSING THE DOCUMENTATION IN THE DOSSIER

FOREST,
PLOT A JOURNEY THAT ALLOWS YOU TO TELL A STORY/ STORIES

FOREST, PUBLISH THE TRACK TO THE WEB USING MAPBOX STUDIO

FOREST,
CREATE A PRINTABLE SYNTHETIC MAP WHERE YOU TELL AND REPRESENT THE STORY/ STORIES ALONG YOUR JOURNEY

FOREST,
DON’T FORGET THE RITUAL AND WHO TAKES PART IN IT. THAT’S WHY YOUR MAP IS WRONG. *THE MAP IS NOT THE TERRITORY*. BUT BY THEN, YOU WILL HAVE LEARNED A PROCESS.