HARMONIZATION OF
LAND COVER CLASSIFICATION FOR WEST AFRICA

SERVIR West Africa LULC-TF

Regional Land Cover Mapping (RLCM)

AGRHYMET and United States Geological Survey (USGS)

Consistent with

Yangambi Classification (Trochain (1957), Monod (1963), Bâ et al (1997), PGRN (2001) and Adam (1966)).

Distinguishing features

- Covers West Africa
- 2000m spatial resolution
- Visual interpretation
- 24 classes representing land cover and land use
- Uses the Yangambi classes for vegetated surfaces
- Incorporates other classes commonly used in West Africa

Land Use and Land Cover based on RLCM classes
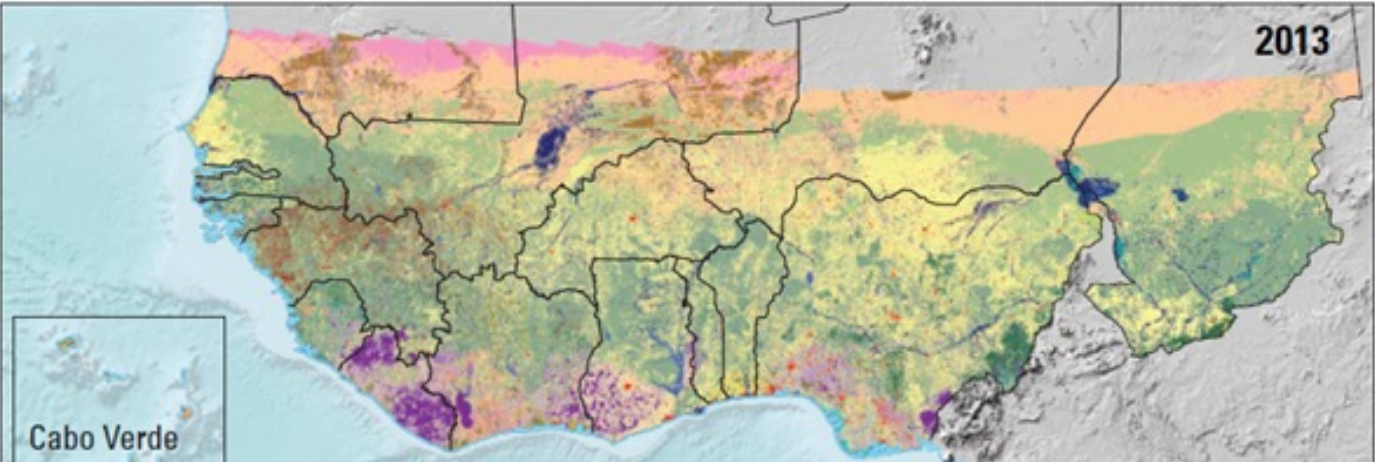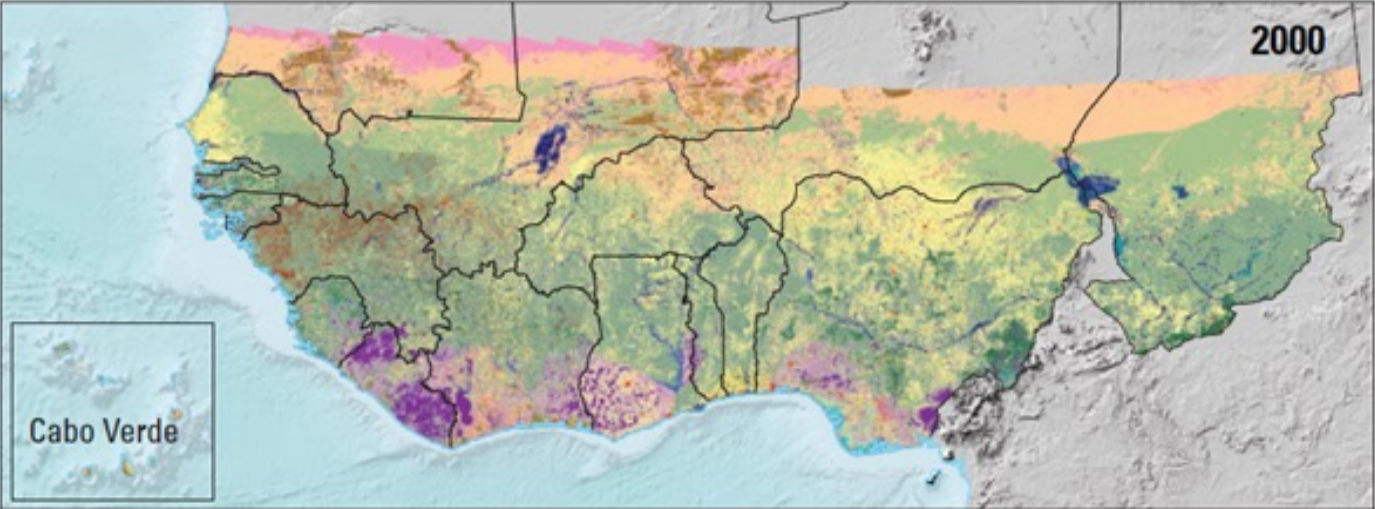
Land use land cover (LULC) class

- Forest
- Degraded forest
- Gallery forest and riparian forest
- Woodland
- Swamp Forest
- Mangrove
- Plantation
- Thicket
- Sandy area
- Savanna
- Sahelian short grass savanna
- Herbaceous savanna
- Shrubland
- Steppe
- Wetland—flood plain
- Water bodies
- Bowe
- Agriculture
- Agriculture in shallows and recession
- Cropland and fallow with oil plams
- Irrigated agriculture
- Rocky land
- Bare soil
- Settlements
- Open mine

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Land Use and Land Cover Classes: Definitions and Visual Presentation

Forêt / Forest

Dense, closed canopy formation of evergreen or semi-evergreen broadleaf vegetation with a multiple strata structure that includes scattered emergent trees. Upper stratum of trees over 30 m tall. Understory composed of evergreen or semi-evergreen shrubs; herbaceous cover is discontinuous.

Forêt galerie & Formation ripicole / Gallery forest & Riparian forest

Forest formations forming a band or corridor of dense vegetation along permanent or temporary watercourses; generally closed canopy and similar in structure to forest; their width, extent, and luxuriance depend on the width, and depth of the valleys they follow, as well as the depth and dynamics of the water table. Riparian forest is similar in structure but is found bordering the edges of streams and rivers.

Forêt dégradée / Degraded forest

Dense, evergreen broadleaf forest with closed or partially closed canopy whose integrity has been degraded by logging or other forms of exploitation. Degraded forest can also be immature forest, or forest in various stages of regrowth after disturbance. Trees 10 to 30 m tall.

Carrière / Open mine

Open pit where rock material is mined

Prairie marécageuse – vallée inondable / Wetland – floodplain

Herbaceous or aquatic vegetation in permanent or semi-permanent wetlands and swamps.

Plans d'eau / Water bodies

Any area with permanent or semi-permanent surface water.

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Forêt claire / Woodland

Open formations of small to medium height trees; tree height over 10 m and tree cover generally between 50 and 75 percent; canopies are often contiguous, with open areas between trees; grass understory can be scattered to dense, often associated with other herbaceous plants.

Forêt marécageuse / Swamp forest

Open to dense forests associated with temporarily or permanently waterlogged soils; these forests are generally found in natural depressions, seasonally inundated.

Plantation

Regular stands of trees planted for the purpose of producing food, beverages, vegetable oils, raw materials for industry, wood, or for protection against wind and water erosion.

Mangrove

Coastal forests of stilted shrubs or trees bordering the ocean or coastal estuaries, composed of one or several mangrove species.

Fourré / Thicket

Dense stand of shrubs, often thorny, forming generally impenetrable cover, with minimal or no herbaceous ground cover.

Savane / Savanna

Herbaceous vegetation with mainly grasses that generally exceed 80 cm in height; dominated by annual and perennial grasses typically associated with the Sudan and Guinea zones; ground cover often consumed by annual fires; woody vegetation is usually present. The savanna class includes several major types or sub-classes, based on density of shrubs and trees; the land use/land cover maps do not distinguish between shrub savanna, tree savanna, and wooded savanna; nevertheless, it is useful to define them:

Savane arbustive / Shrub savanna

Scattered shrubs dominate the woody vegetation, with continuous herbaceous cover usually dominated by grasses; woody cover between 1 and 25 percent.

Savane arborée / Tree savanna

Scattered trees and shrubs with a continuous herbaceous understory usually dominated by grasses; woody cover between 1 and 25 percent.

Savane boisée / Wooded savanna

Shrubs and trees in an open formation with a continuous herbaceous understory usually dominated by tall grasses; woody cover between 25 and 50 percent.

Savane herbacée / Herbaceous savanna

Continuous herbaceous ground cover; trees and shrubs normally absent; this class is represented on the land use / land cover maps.

Savane sahélienne / Sahelian short grass savanna

Scattered trees and shrubs (or only shrubs) with a continuous herbaceous understory usually dominated by annual grasses generally associated with the Sahelian zone; woody cover between 1 and 25 percent.

Bowé

Flat, open surfaces that generally occur as lateritic plateaus; the skeletal, ferruginous soils form a hardened, impenetrable surface, generally absent of woody vegetation, but supporting varying quantities of herbaceous cover during the rainy season.

Steppe

Open, discontinuous herbaceous ground cover, often mixed with shrubs and trees; insufficient cover to carry fire; scattered annual grasses accompanied by widely spaced perennials.
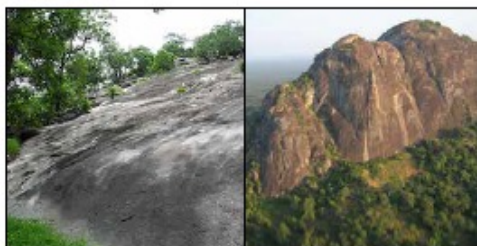

Surfaces sableuses / Sandy area

Beach sand or shifting mounds of sand, formed by wind; active dunes.

Terrains rocheux / Rocky land

Areas of rocky surfaces or outcrops, consisting of rocky peaks, batholiths, talus slopes, crest lines, cliffs, conglomerates, etc.

Sols dénudés / Bare soil

Land with little or no vegetation cover, exposing the soil; examples include eroded slopes, gravel plains, sebkhas, and badlands.

Habitations / Settlements

Built up areas comprising human communities in a village, town or city.

Zone de culture / Agriculture

Cultivated areas, with crops dependent on rainfall.
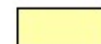
Cultures irriguées / Irrigated agriculture

Cultivated areas where crops receive water through an irrigation system to support their growth without relying on rainfall.

Cultures des bas-fonds et de décrue / Agriculture in shallows and recession

Cultivated areas in depressions or along river banks where crop development occurs as the waters recede during the dry season.

Cultures et jachères sous palmier à huile / Cropland and fallow with oil palms

Cultivated areas, with scattered oil palms in the fields; crops are mainly dependent on rainfall.

Suggestions for harmonizing Glance and RLCM-USGS Land Cover classes

Forest

- Forest
- Degraded forest
- Gallery forest and riparian forest
- Swamp Forest
- Mangrove
- Plantation

Shrub

- Savanna
- Woodland
- Thicket
- Shrubland
- Sahelian short grass savanna

Herbaceous

- Herbaceous savanna
- Bowe
- Steppe

Cropland

- Agriculture
- Agriculture in shallows and recession
- Cropland and fallow with oil plams
- Irrigated agriculture

Developed

- Settlements
- Open mine

Bare

- Rocky land
- Bare soil
- Sandy area

Water

- Water bodies
- Wetland—flood plain

Methods: Collaborative ground truth data generation

QGIS
1. Generate random points (Lat/Long),
2. Reproject to UTM30N,
3. Generate square buffer to produce 30m*30m boxes,
4. Reproject back to Lat/Long,
5. **Split by organization and send to participants…**

Google Spreadsheets + Google Earth Pro
1. Create Google Spreadsheet with same IDs,
2. **Use Google Earth Pro to identify landcover,**
3. Export as CSV.

QGIS
1. Merge all CSVs, attach to random points as attribute, save as shapefile

GEE
1. **Use this shapefile to run classification in GEE.**