

## THEMATIC CARTOGRAPHY OF CONTINENTAL EQUATORIAL GUINEA

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### Abstract

The lack of topography and the inaccessibility of the tropical forest have taken to the use of remote sensing techniques in the creation of thematic cartographies of Continental Equatorial Guinea. The maps created at 1:400.000 scale include geotic, biotic and synthesis aspects. Its aim is to define the physical environment of that area in central Africa, orientate the management of its resources and promote the publishing of atlas.

### 1 Introduction

The creation of thematic cartographies of the Continental Equatorial Guinea is in line with the criteria of the Scientific Commission of the non governmental organization "Asociación Africanista Manuel Iradier", to support the sanitary and educational cooperation. Many professionals in different disciplines have cooperated.

Some of the comments to the maps created are summarized in this communication. The aim is to define and study the physical environment, give assistance for its management and generate educational and guidance materials, ending the study with the publication of atlas, not existing to these days.

### 2 Location

The Republic of Equatorial Guinea is located on the homonym gulf, close to the equator, between parallels 1°N and 2°N. This Central African country is made up of the islands of Bioco, Annobón, Corisco and Elobeyes and the Continental Equatorial Guinea. The total surface of the country is 28,000 square kilometers, 26,000 (92%) of which correspond to the continental zone. The Continental Equatorial Guinea, object of the present study, is located between Cameroon and Gabon (Figure 1).

### 3 Climate

Three are the main climate features of this territory: its thermal uniformity, its high pluviometry and the lack of a dry season. Its climate is characterized by medium monthly temperatures always above 18°C (climate with no winter) and abundant rain (over 2000 mm/year). Two seasons with minor rain can be distinguished. The longest and more clearly marked, "la seca" lasts from mid-June to mid-September, July being the driest month. Another season with less rain is the so-called "la sequilla" around the month of January. The rainy seasons takes place between the mentioned dry ones. The average yearly temperature is around 24-25°C. The atmospheric humidity remains high all year long, over 80% of relative humidity.

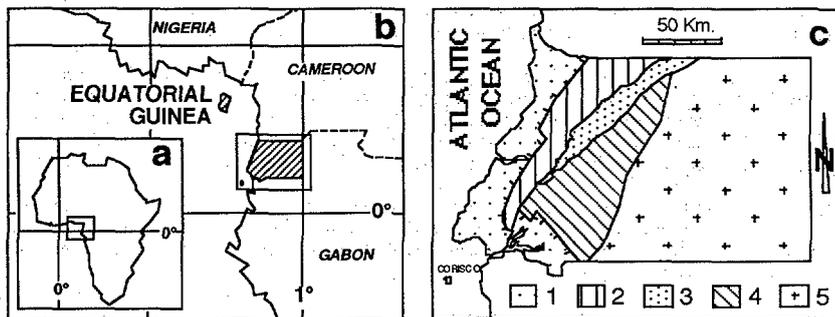


Figure 1: a: Location of the figure 1b. b: Location of Equatorial Guinea is striped. Figure 1c is in the rectangle. c: Elemental morphological units. 1: coastal border; 2: coastal mountain range; 3: Uoro rift; 4: internal mountain range; 5: internal platform.

#### 4 Relief

Two elemental morphologic units can be distinguished: the coastal border and the cratón, both being limited by a cliff. The coastal has a medium altitude not over 200 metres and it is characterized by a badly river network with plenty of marshy areas.

The craton occupies two thirds of the area studied with a medium altitude of 600 metres. The inside of the craton is also characterized by a bad draining. Four morphological units can be distinguished from west to east, with guidelines subparallel to the coast line: a coastal mountain range which not over 500 meters high; the depression of Uoro; the interior mountain ranges which reach 1000 meters of altitude and an interior penillanura up to 300 meters of medium altitude in its southern area. (Figura 1 c).

Hydrographically, 18 basins have been distinguished; Uoro and Muni rivers mean 66% of the total analyzed surface. The predominant shapes of the draining networks are dendritic through structural control of the crystalline substract [1].

#### 5 Vegetation

The continental Region of the Republic of Ecuatorial Guinea is located in the heart of the Gabon-Zaire area of the African tropical rain forests. Except for small areas, the tropical rain forest used to occupy the whole territory before human activities generated vegetal communities deriving from the forest's destruction.

The primary forest corresponds to the tropical rain forest in its state of maximum maturity. It is a complex forest due to the biodiversity inside it and its structure, with several levels or substracts, each of them with their own vegetal and animal communities. Rich in epifita plants (orchids and bracken, mainly) the soil is however, clean covered with fallen leaves with few herbaceous or bushes. Around 24% of the surface of the Continental region still preserves the primary forest. No doubt it is an important percentage which requires urgent protection. The main spots are found in less populated and most mountainous areas. Agriculture is usually the main reason for the destruction of the primary

forest. When the farming land is abandoned, a succession of vegetal communities grow and, by substituting ones to the others, they tend to the reinstauration of the primary forest.

The initial stage is called bicoro. It is a very closed and hard to cross formation, which strongly invades the clearings and made up of bushes, big herbaceous, climbing plants and some trees. Some big herbaceous such as *Aframomum alviolaceum* and *Vernonia conferta* are also present. Above this all, a mix of bracken and other climbing plants climbs 5 or even more meters. Almost 42.5% of the surface of the Continental region is covered by bicoro, which is the most common vegetal formation.

After some years the bicoro becomes a secondary forest. It is the following formation in the restoration process of the virgin forest. *Musanga smithii* and *Elaeis guineensis* are characteristic. In the Continental region, the secondary forest occupies around 31.8% of the vegetal cover, spread in masses all around the territory.

The mangrove is the most common vegetal formation by the big rivers in the area influenced by the tides, but far from the direct action of the open sea. In spite of representing only 1% of the surface, mangroves are extremely valuable ecosystems with animals of high interest.

The coastal prairies are found right by the coast. The forest is suddenly interrupted and herbaceous plants develop. These are lands located in emerged beaches, made up of sand, highly washed and without humus. They are hardly present in the vegetation map (0.03%) but they are of extraordinary singularity and of a high scientific interest.

Finally, the farming lands, mainly of *Elaeis Guineensis* do not exceed 0.5% of the area studied.

## 6 Geology

The geological units defined in the Continental Equatorial Guinea have been: the Congo-cratón; the meso-cenozoic basins of Douala and Gabon, north and south of the coastal line, respectively; and several recent intracratonic miocene basins.

Other cartographed materials are the following: coastal and alluvial deposits, dikes, volcano cones in the Uoro rift and a possible impact crater [2].

### 6.1 Congo Craton

Continental Equatorial Guinea is located on the north edge of the Congo Craton (Zaire). It is basically made up of gneises in granulitics facies with a middle age of 2800 m.y.a. [3].

Inside the craton three litological units can be distinguished: the basal complex, greenschists belt and granitoids. The basal complex is made up of granulitics gneis of charnoquitic character, in some cases accompanied by granulites and gabros. The greenschists belt is composed by rocks with a lower degree of metamorphysm, with important volcanosedimentary deposits of basic to ultrabasic composition, which in some cases reach the anfibolitic facies. The granitoids correspond to large masses of variable composition and texture, from granites s.1 to diorites. In general, the geometric relations in cartography show the granotiods intruding the basal complex and therefore the greenschists belts.

### 6.2 Douala and Gabon basins

The Douala and Gabon basins are located on the coastal strips and are directly supported on the craton behind a well marked topographic cliff. These are basins filled with meso-cenozoic materials in relation with the Atlantic rift and its posterior evolution as passive margin. In both basins, three large stratigraphic units can be distinguished: pre-, syn- and post-rift [4].

The pre-rift unit corresponds to the basement. The syn-rift stratigraphic unit starts in the Neocomian and it is characterized by the deposit of continental terrigenous series. In the post-rift period three large sequences can be distinguished: an aptian evaporitic sedimentation; a detritic albo-cenomanian sequence in relation with a protoceanic phase; and an oceanic sequence with high volumes of clastic material [5].

### 6.3 Intracratonic basins

Several basins can be distinguished on the craton associated to a same distensive process: a system of E-W direction longitudinal semigrabens developed behind dip faults to the south, and the Uoro rift.

Powerful accumulations of fluvial deposits with a high percentage of pebbles from geneises and quartz sandstones with clays proceeding from the dismantling of lateritic levels are recognized. The age of these accumulations is very recent, possibly miocene.

The Uoro rift, of NE-SW direction, is 90 km long and with a maximum width of 14 km; it is the most characteristic feature of the Continental Equatorial Guinea (Figure c1). Its structure is a strike-slip duplex, associated to the same distensive process which has developed the miocene-recent intracratonic semigrabens. The deposits observed in the rift have always been of detritic fluvial character, with a high amount of material proceeding from lateritic levels and volcanoclastic materials in a lower proportion.

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