Republic of CAMEROON

CAMEROON GEOLOGICAL SETTING

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The REPUBLIC of CAMEROON lies midway between West and Central Africa. It stretches from the Gulf of Guinea in the South-West to Lake Chad in the North and lies approximately between 11° of (attitudes (01° 80' - 13° 00' N) and 08° longitude (08° 251 - 16°20' E). It is bounded to the:

- South-West and West by the Gulf of Guinea (the Atlantic Ocean) and the Federal Republic of Nigeria respectively;
- North by Lake Chad;
- North-East and East by the Republics of Chad and Central Africa respectively;
- South by the Republics of Congo, Gabon and Equatorial Guinea
The establishment of the Cameroon geological map has commenced just before the first world war, when geological sketches of 1/6 000 000 have been published. After the this first world war, a service of mines has been created in 1927 and his mission was to realized mining activities. Since 1946, the service of mines has initiated a vast programme of geological prospecting which has permitted to cover the whole territory, and 16 map sheets of 1/500 000 have been established. In 1956 a geological map of 1/1000 000 has been elaborated.

In 1979, the 16 map sheets have been compiled and has permitted to obtain the first 1/500 000 map and the explanatory note has elaborated in 1986.
Cameroon's geological history begins with the Archaean era between 3.5 and 2.5 billion years (Ga) ago. Its different phases of development are illustrated by geological masses formed during successive orogenic cycles characterized by the formation of mountain ranges, and subsequent extension phases by the splitting of the continental crust.
Cameroon is generally acknowledged to have experienced three orogenic cycles:
1. The Liberian cycle, exemplified by the Ntem complex, which dates from the Archaean era, and is about 2.5 billion years old
2. The Eburnean or Transamazonian cycle, with the Nyong and Ayna, formations, which date from the Palaeoproterozoic period (2.5-1.8 billion years ago);
3. The Pan-African cycle, which comprises formations from the Neoproterozoic era 1,000-600 million years (Ma) ago.
The extension phases consist of:

- The Lower Palaeozoic period, during which Mangbaii-type series were deposited, around 580 million years ago;
- The Cretaceous era, is exemplified by the Benue trough and its coastal and continental counterparts, which were formed around 110 million years ago;
- The Tertiary era, when the plutonic and volcanic complexes of the Cameroon Line were formed, about 70 million years ago.

The Quaternary period is exemplified chiefly by continental erosion and recent alluvial deposits, particularly on floodplains and in subsidence zones.
The geology of Cameroon is divided into five geotectonic units: (J. Vicat et al, 1998).

- The Craton: situated at the extreme south part of the country, it is called the Ntem formations and comprises charnockites, leptynites, gneiss & granodiorites, all cut by greenstones dykes. These formations are estimated to be dated between 2.8 and 3.6 Ga (Archean age) and are composed of Nyong, Ntem and Ayina series (from the W to the E) in which green stones belts have been identified;

- Craton cover (proterozoic) is located in the southeast Cameroon on the border of CAR and Congo Republic. It’s discordant with the Mbalm belt and covered partially in the north by the Yaounde nappe. This Craton Cover include the upper carbonated), Dja series (650-540 My)
the Bélé-Libongo tillite complex, (850-650 My) the Boulou and Mouloundou sandstones, arkoses, conglomerates and shale series of the lower Dja, and the Lobeke numerous dolerites dykes and sills occur with pillow lava and occasional syenite plutons;

- the Panafrican Chain is covering the greater part of the territory and its formations have been put in place during the orogeny of the whole
continent of Africa. Its characterized by a stretching belt directed E-W from Sudan to Gulf of Guinea and which extends into Brazil territory. This chain (including two entities: the christallophyllian and migmatitic formations of paraderived origin, and granitoïds which are either anatexic or syn and post-tectonic and most of them are calco-alkili), which belongs to the Oubanguides one, is cut by destral mylonitic shear zones trending NE-SW the Sanaga Fault (SF) and the CCSZ (Central Cameroon Shear Zone).
The Paleozoic and the Cretaceous are the two types identified in Cameroon.  
(1) Paleozoic (northern part) is azoic volcanic-detrital deposits (Hoye near Poli) & Mangbei (Chadian border) dated Devonian-Ordovician (370-490 My by K/AR) overlying the Panafrican;  
(2) Cretaceous:  
**✓** fluvio-lacustrine deposits with Aptian, cenomanian and Turonian sandstone (Mamfé & Benoué areas);  
**✓** Coastal basins (Rio del Rey, Douala & Kribi-Campo, Bakasi area) with deposits dated Eocene & Miocene contain oil & gas;  

Quaternary (Far north in the Logone-Birni) is related to the sedimentation of the lake Chad and is analogous to the Doba oil fields. This group is including the Yagoua sedimentary basin.
The CVL comprises a N30°E of alkaline oceanic and continental volcanic edifices which began about 44 My and still active. The CVL also including about 60 anoregenic plutons with syenites, granites, diorites and gabbros. (from Pagalu & Malabo islands to lake Chad). Recently, a gravity modelling has shown an uplift of dense rocks in the granite–gneiss substratum, found at an average depth of about 8 km. This dense material, which runs parallel to the Foumban Shear Zone (FSZ), is interpreted as an igneous intrusion probably of basaltic composition, which may be associated with the Cameroon Volcanic Line (CVL). The ascent of the body may have been facilitated by the reactivation of the FSZ.
This geology is favourable to the mineralization of substances as precious metals (gold, diamonds) base metal, rare metals etc, and hydrocarbons. So that we can have for example in :

- Congo Craton - Archaean Greenstone belts (South): iron ore (Mbalam, Kribi), uranium (Lolodorf), Diamond (Mobilong)
- Central Cameroun shear - Poli series (North): uranium, saphire, gold,
- Sanaga shear zone - Lom series (East): gold
- Pan African Mobile Belt: (Placer gold)
- Sedimentary basins: oil & gaz (Douala, Campo, Kribi) salt, sapphire (Mamfé).

In spite of the international financial crisis Cameroon is looking for partnership to develop a new mineral indices inventory, trough that geological information can be ameliorated and the realization of 1/200 000 geological map can be done.
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