

D.R. CONGO : MINING OF VAST HISTORICAL EXPLORATION DATABASES MAY REVEAL NEW MINERAL RESOURCES

INTRODUCTION

The vast majority of known mineral resources of the Democratic Republic of the Congo (DRC) are hosted by old Precambrian rocks that rim the central Congo basin (the so-called “Cuvette Centrale”) which is filled with younger Phanerozoic sediments (Figure 1). These ore deposits have been discovered and exploited during vast intensive exploration campaigns that took place during the first part of the 20th century. The archives of most

colonial mining companies involved in these campaigns are still available and they constitute a unique database on the Congolese mineral endowment. GF Consult has expert knowledge about these data and has performed numerous data compilation studies for mining companies that are currently seeking opportunities for mineral exploration and exploitation in the DRC.

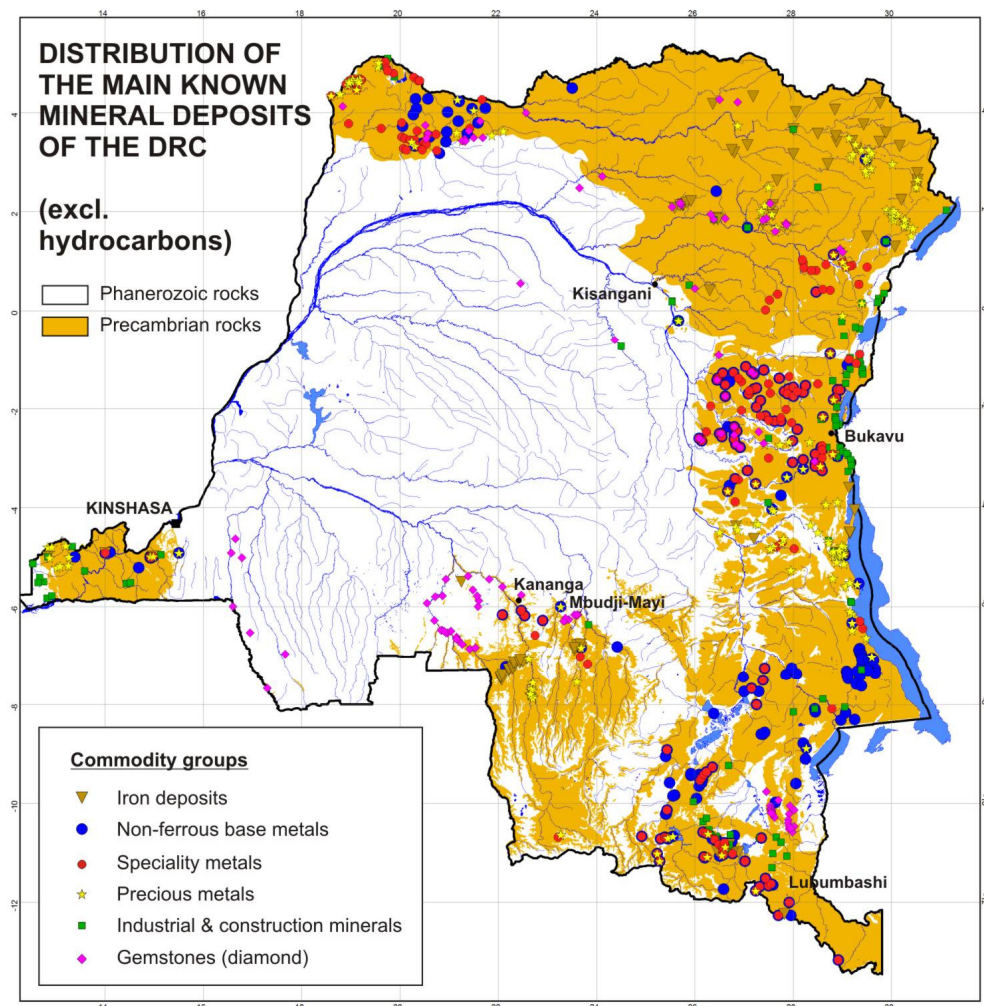


Figure 1. Distribution of the main known mineral deposits of the DRC against the backdrop of the large-scale geology (distribution of mineral deposits from the GIS-based inventory of mineral resources of the DRC created by GF Consult and the Royal Museum of Central Africa – see www.gfconsult.be for more information)

CONCISE HISTORY OF MINERAL EXPLORATION IN CONGO DURING THE COLONIAL PERIOD

Intensive regional exploration of the Congolese Territory took place mainly in the 40 year period between 1920 and 1960. During that period, nearly every major and minor river draining the Precambrian rocks surrounding the Congo Basin was systematically prospected by alluvial panning and geological reconnaissance. This led to the discovery of the main Congolese mineral deposits known to date.

SUBDIVISION OF THE CONGOLESE TERRITORY AT THE BEGINNING OF THE 20TH CENTURY

Already in the very beginning of the 20th century, during the dark pre-colonial period of the Congo Freestate (1885-1908), some small, semi-industrial mining operations were undertaken by European companies, for example for gold at Kilo in the North East (°1905) and at Mutoshi (Ruwe, °1904) in Katanga, and for copper near Ubundu (mine de Bamanga, °1905). However, at this time, systematic exploration had only just begun in Katanga and (north)eastern Congo. Exploration (and gold exploitation) was performed in Katanga in the beginning of the 20th century by the “Tanganyika Concessions Ltd” (TCL, °1899) a British company affiliated with the British South Africa Company of C.J. Rhodes. In northeastern Congo, the Kilo gold deposit had been evaluated and brought into production by 1905 by Australian prospector Robert Hannam on account of King Leopold II and his Congo Freestate.

In 1908, Congo became a Belgian colony. From then onwards exploitation of its vast mineral resources would become the most important pillar for its industrial development.

By 1912, the Congolese territory was divided into six areas carrying exclusive mining and/or exploration rights and administered by only a handful of players (Figure 2). Among them the railway companies “Chemin de Fer du Bas-Congo au Katanga” (BCK, °1906) and “Chemins de Fer du Congo-Supérieur aux

Grands Lacs Africains” (CFL, °1902) which had received huge land grants in return for the development of a railway system. This practice was inspired by similar operations in Africa (e.g. Cecil Rhodes’ British South-Africa Company) and around the world (e.g. the American railways). The mining domain of the CFL would be split in two during the mid-1920s, where one part would be given to the “Comité National de Kivu” (CNKi, °1927), a commercial enterprise set-up for the development and organisation of colonial settling in the Kivu region. The remainder of the CFL domain would be opened to public prospection in 1922. However, by this time, the CFL had already been able to establish vast exploitation concessions for gold, tin and tungsten (for example the Twangiza gold mine currently being exploited by Banro Resources Inc).

In Katanga, the “Comité Spécial de Katanga” (CSK, °1900) a joint-venture between the colonial government and the “Company du Katanga” (a kind of chartered company that would become dominated by the Société Générale de Belgique) had received exclusive administration rights over the entire province (including mining rights). It would, on its turn, grant mining concessions over most of the Congolese copperbelt as well as part of the Kibaran mountain belt to the “Union Minière du Haut-Katanga” (UMHK, °1906). The remainder of the mining domain of the CSK would be opened up to public prospection in 1910.

More than a third of the Congolese territory was given in exclusive exploration concession to the “Société Internationale Forestière et Minière du Congo” (FORMINIERE), a private Belgian-American enterprise (between the colonial government, the Société Générale de Belgique, Daniel Guggenheim, Thomas Ryan, and a number of private investors) which would be involved in forestry, agriculture and mining in Congo. In the southern part of this area (south of the 5th parallel south), the FORMINIERE received exclusive exploration rights up to 1912 and in the northern area (north of the 5th parallel south) up to 1925.

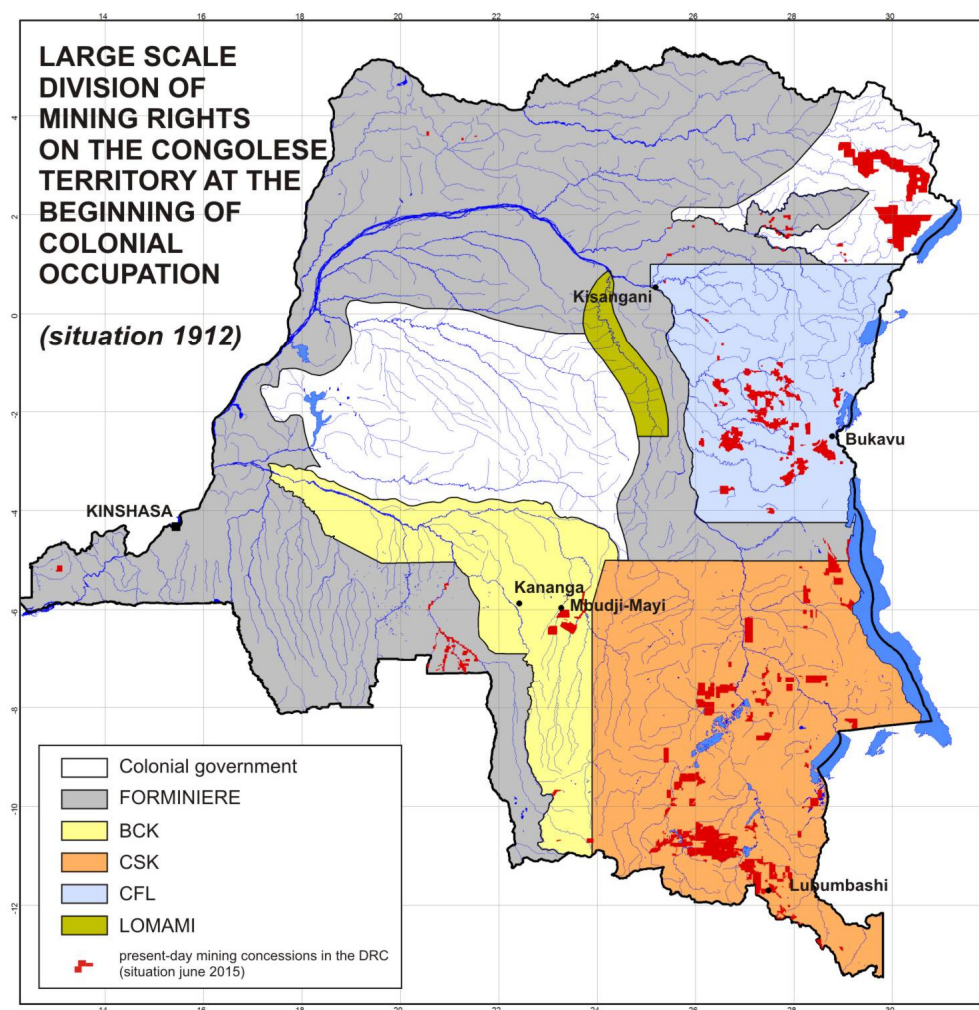


Figure 2. Large-scale distribution of mining rights on the Congolese territory at the beginning of colonial occupation (situation in 1912). Also indicated are the current exploitation concessions (PE and PEPM) as of June 2015 according to the DRC Mining Cadastre portal).

In case of discovery of mineral resources, it was entitled to acquire mining concessions over a surface totalling 3.7 million hectares. The FORMINIERE immediately launched several regional exploration campaigns performed by an international group of geologists and mineral prospectors often with experience in exploration programmes in the United States, Australia and South Africa (e.g. the first diamond was found in the famous Kasai diamond field in 1907 by a prospector, Narcisse Janot, belonging to an exploration group led by Millard K. Shaler, a geological engineer of the U.S. Geological Survey; in Northeast Congo, the Australian brothers A.E.H. and C.A. Reid discovered a multitude of gold and iron deposits). During the remainder

of the colonial period, the FORMINIERE and its subsidiaries would be the main operators of the exploration campaigns in the Kivu and Kasai provinces on account of many colonial public and private mining companies.

The Colonial administration had preserved the extreme northeastern part of the Congolese territory for the state-controlled “Régie Industrielle des Mines de Kilo-Moto” (°1919; later “Société des Mines d’or de Kilo-Moto”, or SOKIMO). The other parts of its domain, i.e. the central Congo basin, were devoid of economic mineral deposits (as would be the domain of the “Compagnie du Lomami” which would have only a limited involvement in mining).

THE COLONIAL MINING BOOM AND POSTCOLONIAL EVOLUTION

From the late 1920s onwards, Congo saw a boom in private and public mining companies. Between 1920 and 1960, over one hundred companies held mining concessions in Congo. However, many of these companies were related and/or controlled by a relatively small number of powerful financial holdings (e.g. the Compagnie du Congo pour le Commerce et l'Industrie, the Société Générale de Belgique, Banque de Bruxelles, the group Empain). In the field, this meant that the operational mining and exploration activities for all these companies were realised by a limited group of technicians (prospectors, geologists, mining engineers). For example, in the Kivu area (CFL mining domain), nearly all prospection and exploitation was done by the "Société Minière de Tele" (TELE, °1912) and later by the "Compagnie Belge d'Entreprises Minières" (COBELMIN, °1932), both subsidiaries of the FORMINIERE. The only other exploration company active in the region was the "Société Belge des Recherches Minières en Afrique" (REMINA, °1923).

At the time of Independence (1960), virtually all major mineral deposits known to date had been discovered and had been brought into production (Figure 3). In the years following Independence, existing mining companies were split in a Belgian and Congolese part, whereby the latter (holder of the mining assets) was sometimes partly or fully nationalised. These assets form, for example, the core of the present-day Gécamines, Okimo and Sakima. In the post-colonial epoch, important additional exploration campaigns were set-up in some areas, either by private or public companies such as Falconbridge and Sominki or by national or international cooperation projects performed by the French BRGM and the Congolese Geological Survey. Furthermore, Congo has seen renewed international interest in exploration and mining, especially during the last two decades. This has led to the discovery of extensions of primary mineralisation around existing mines (e.g. Banro Corporation's Twangiza project), or in few cases to the

discovery of new deposits (e.g. Ivanhoe Mines' Kamoa deposit). However, never again has there been such large-scale, regional systematic exploration as during the 1920s to 1960s.

EXPLORATION TECHNIQUES USED DURING THE COLONIAL PERIOD

During the colonial epoch, regional exploration was mostly done in a systematic and consistent way by experienced personnel. Prospecting techniques and sampling protocols were specified in detailed technical manuals (e.g. Figure 4). Exploration was done in progressive phases, from regional scale to detailed surveys.

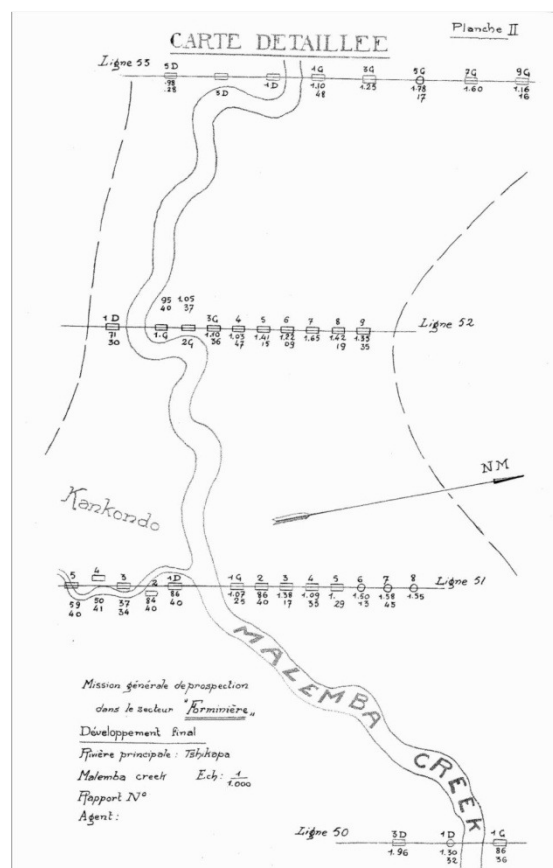


Figure 4. Extract of a prospection manual of the FORMINIERE showing a map on 1:1000-scale that accompanied the instructions on how to evaluate alluvial flats by pitting (FORMINIERE, undated, Collection RMCA)

In addition to alluvial prospection, exploration could make use of drilling (a.o. "Banka-drill"), or of geophysical methods. For example, one of the first applications of the "Schlumberger-

array electrical conductivity method” was on regional exploration for copper ores in the copperbelt around 1923 (on account of the UMHK). In general, however, exploration consisted of alluvial prospection by pitting and trenching.

Discoveries showing grades considered profitable at the time were followed up by detailed exploration campaigns. This could involve pitting of the relevant alluvial flat at more closely spaced intervals, estimation of contained placer resources and detailed investigation by grab sampling, trenching or underground evaluation of primary mineralisation. If judged profitable and opportune for exploitation, the mineralisation was brought into production. However, in many cases, this only applied to the secondary placer deposits. Little further investigation was done for their (often lower grade and more difficult to extract) primary sources, except in case of unusually large deposits.

As a consequence, there is ample opportunity for discovery of primary and secondary deposits based on exploration data obtained during the historical surveys which were never followed up in detail.

microfilms), and certain information might be preserved in the archives of the Colonial government presently held by the Belgian Ministry of Foreign Affairs.

However, the technical information contained in these archives has never been fully organised and/or analysed. Finding, extracting and evaluating the relevant information about a specific area is therefore challenging.

GF Consult bvba has a long experience with these archives and has performed numerous data compilation studies for exploration and mining companies active in the DRC. For more information on how we can assist in accessing, retrieving and evaluating such historical data on the Congolese mineral endowment, please do not hesitate to contact us at following address :



GF Consult bvba
Antwerpsesteenweg 644
B-9040 Gent, BELGIUM
e-mail : tech@gfconsult.be
tel : +32 9 395 00 30

THE ARCHIVES OF COLONIAL MINING COMPANIES TODAY

The archives on the technical aspects of exploration and mining (e.g. exploration results, maps, monthly and annual reports, mining production tables, etc) by the colonial mining companies are currently scattered in various institutions. Some have inevitably gone lost. Fortunately, the most important collections are being preserved by the Royal Museum of Central Africa (Tervuren, Belgium). These include the archives of the FORMINIERE, the CFL, the CSK, COBELMIN, REMINA, and many others (over five thousand files containing numerous reports, assay files, exploration maps, and about a thousand detailed mining plans of alluvial operations). Furthermore, the Belgian State archives hold the technical archives of the UMHK (some four hundred forty files, maps and