

Iron Ore

in Sudan



Republic Of The Sudan
Ministry of Minerals



Geological Research
Authority of the Sudan
(GRAS)

Introduction:

Iron ore occurrences are widely spread in the Sudan. They mainly occur in basement complex rocks, the Nubian Sedimentary Group and the residual laterites in tropical areas.

The most important occurrences are those found in Kordufan,

Darfur states and the Red Sea Hills. Some of these deposits have been studied up to the evaluation stage, while others are only at the preliminary stages of investigation.

**1- Abu Tulu Iron Deposit:**

Abu Tulu (lat. 11° 14' N - Long. 28° 00' E) forming two isolated inselbergs, is about 30km east of Rigl El Fola railway station in west Kordufan State. The ore occurs in quartz sericite schist overlain by porphyritic andesite. Preliminary evaluation of ore indicates 35 million tons. However, a later reevaluation has increased the tonnage to 80 million tons.

The ore mineral is mainly hematite with subordinate magnetite. The iron content is about 61%, free silica about 7% with minor amounts of sulphur and phosphorous. In the Nuba Mountains, to the east of AbuTulu, iron ore occurrences have been reported in jebel El Ahmar west of Abassya town. The ore occurs as lenses and the mineralized zone is traceable for a distance of over 7km in length and reaches a thickness of 50m in some places. The ore mineral is mainly magnetite with a total iron content of up to90%.

2- Karnoi Iron Deposit:

Several extensive iron mineralized zones have been located around karnoi (Lat 15° 00'N - long. 23°00' E). The ore is mainly hosted by a series of low grade metasediments comprising sandstone and quartz mica schists. Ore Reserves on surface is estimated at 12 million tons grades up to 60% Fe.

3-Iron Ore Deposit in the Red Sea Region:

The Red Sea region is underlain by low- grade volcano-sedimentary sequences (green stones) of Late Proterozoic, intruded by plutonic complexes and subjected to various phases of deformation and metamorphism. The upper sequences host number of iron deposits. Most of the deposits are considered to be of economic importance due to exposure on surface, and proximity to sea ports. The most significant deposits are those of Fodikwan, Sofaya and karora.



3.1 Fodikwan Group:

The Fodikwan iron ore deposit lies in the northern part of the Red Sea Hills (lat. $21^{\circ} 44' 33''$ N and long. 36° E). It lies 270km north of Port Sudan and only 17km away from Oseif port. The deposit consists of three ore bodies hosted within a Pre -Cambrian low grade sequence (Oyo Series). The ore bodies are made up of magnetite being partially or totally replaced by hematite. Iron content ranges between 50 to 60%. Another nearby occurrence (Grab Deiheit) is mainly composed of hematite with an average iron content of 40%.

3.2 The Sofaya Group:

This is a group of seven ore bodies located around the Sofaya village, in the northern Red Sea Hills (lat. $20^{\circ}15'N$ - $21^{\circ} 25'N$ - $21^{\circ} 25' N$ long. $36^{\circ} 25' E$). The seven ore bodies lie 65 to 120km to the west of Abu Imama harbor north of Portsudan.

The occurrences making El sofaya group are named Aderweib, Ankur, Yawkurar, akiat, Aguisah, Sofaya, and Mafideib. The ores are hosted within the metavolcano-sedimentary sequence of Naferdeib Series. The ore minerals are mainly magnetite, hematite and some goethite.

The first three mentioned ore bodies have been evaluated giving a total of 13 million tons of ore, with an iron content ranging from 50 to 60%.

3.3 Karora Iron Deposit:

Karora Iron deposit is located in the Southern Red Sea Hills (Lat. $17^{\circ} 42'17''$ N and long. $38^{\circ} 17' E$),. Karora is connected to Portsudan via a 350 km long coastal road. karora itself is at the upper reaches of Tokar delta and located about 150 km away from Trinicitat harbor. The ore is hosted by the volcano -sedimentary sequences of Red Sea Hills. It occurs in the form of lenses at the contact between igneous intrusive and carbonate rocks. Karora deposit is composed of four separate bodies with a total reserve of 32 million tons ranging from 33 to 53% Fe. The ore is made up of magnetite, hematite, siderite and limonite.

4-Iron Ore of Wadi Halfa Region:

The studied area is bounded by (Lat. $21^{\circ} 54'$ - $22^{\circ} 00'$ N and long. $31^{\circ} 20'$ - $31^{\circ} 45'$ E) about 30km east of Wadi Halfa at the shores of the Nuba lake.

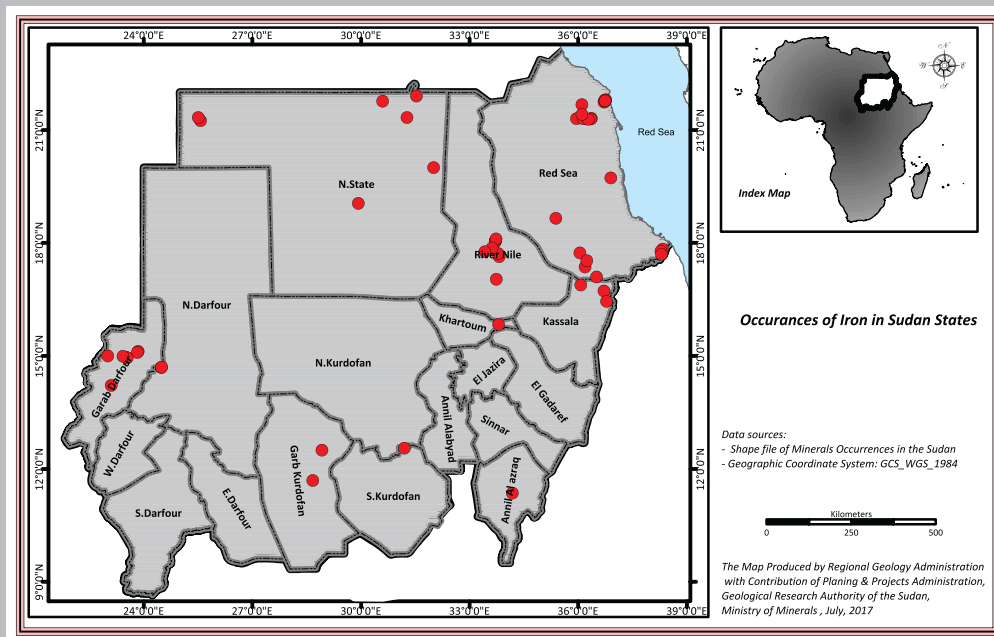
The area is accessible through both railway and motor tracks. The ore is associated with the Nubian Sandstone Sequence. The iron ore is mainly oolitic and associated with level C (arenaceous unit within the formation).

The thickness of the ore varies from 30 cm to 1m and the ore is mainly composed of a dark-reddish colored hematite. The formation is cut by two sub vertical fracture planes trending N-S and E-W, cutting both the sandstone and the oolitic iron ore.



Chemical analyses of 10 samples of the ore returned the following results:

Element	Lowest value	Highest value
FeO+ Fe ₂ O ₃	37.5 %	80.2 %
SiO ₂	4.1 %	40 %
TiO ₂	0.051 %	0.47 %
Al ₂ O ₃	2.2 %	7.85 %
MnO	0.29 %	4.2 %
P ₂ O ₅	0.34 %	2.7 %
Cr	30 ppm	140 ppm
V	210 ppm	1035 ppm



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