Conclusion

6. Highlights of the Present Study

1. The BIF bearing Archaean volcanosedimentary successions of Singhbhum, constituting the Iron Ore Group are the main repositories of the iron ores. The undeformed and unmetamorphosed volcanosedimentary succession of Gandhamardan Hill area represents the youngest cycle of BIF deposition as indicated by the presence of siliciclastic sediments below BIF horizons that is derived from older BIF bearing supracrustals. Sedimentology of the BIF bearing succession reveals their deposition in outer shelf environmental setting.

2. Iron ores in Gandhamardan Hill deposits are of two types; (i) replacement vein type ores that occur as bodies with irregular shapes close to subvertical faults within the BIF horizons, named slope ores and (ii) tabular sheet-like ore body above the BIF horizon, which is overlain by ferruginous laterite, designated as top ore.

3. Map and outcrop data along with petrographic attributes of the replacement vein-type ore (slope ore) indicates their development within BIF, close to some vertical faults. Features in such slope ores suggest invasion of iron rich hydrothermal fluid in BIF and replacement of jaspery bands to form massive ore. A geochemical linkage between BIF, mineralized BIF and ore is predictable.
4. The top iron ore bears mineralogical and geochemical similarities with slope ore, with minor changes, suggesting modification of type slope ore during exposure to supergene enrichment processes.

5. Development of replacement vein type slope ore close to subvertical faults suggests that the subvertical faults might have acted as conduits for upward migration of iron rich basinal ore fluids. The underlying volcanic succession might have acted as a source for iron for the iron ore mineralization.

6. Hence the BIF hosted iron ore deposits of Gandhamardan Hill area represent a typical hydrothermal iron ore deposits that has suffered partial modifications when exposed to atmosphere.