

**GOVERNMENT OF INDIA
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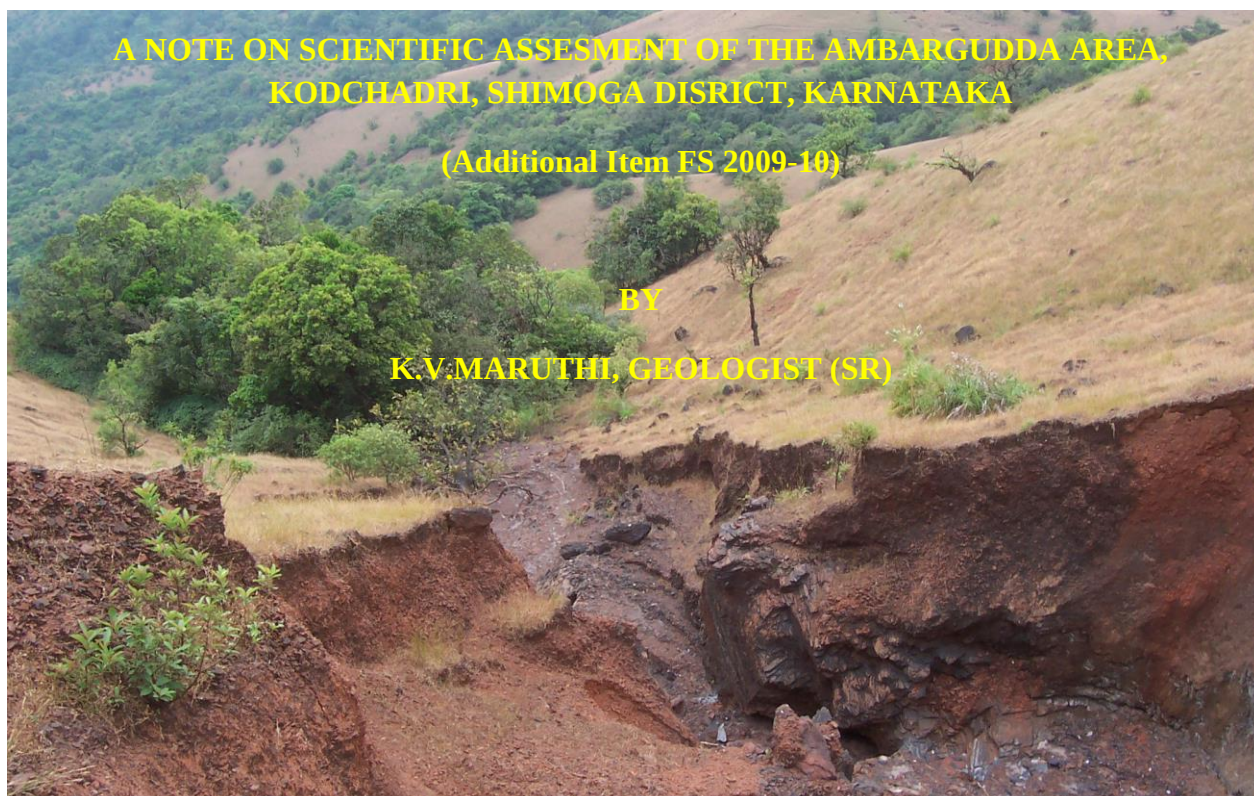


**A NOTE ON SCIENTIFIC ASSESSMENT OF THE AMBARGUDDA AREA,
KODCHADRI, SHIMOGA DISTRICT, KARNATAKA**

(Additional Item FS 2009-10)

BY

K.V.MARUTHI, GEOLOGIST (SR)



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The Director General, Geological Survey of India

**Project: ENGINEERING GEOLOGY
OP: KARNATAKA & GOA
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Introduction:

The Scientific assessment of the Ambargudda area in Shimoga district was taken up as per the request from the Chairman, Western Ghat Task Force, Government of Karnataka. The study was carried out on 22.12.2009 along with Chairman and members of Western Ghat Task force, District Collector and other revenue officials from the district; CCF,DFO and other forest officials from Forest department; Joint Director and Geologists from Mines and Geology Department; Scientists from various organisations like IISc, Universities; Environmentalists from various organisations and NGO's; Media people and Local residents. The objective of the proposed visit was to evaluate the damage caused due to Mining activity in the area and the landslide caused due to mining, risk involved from landslide and suitable future course of action.

Location:

The investigated Ambargudda area is near Marati village, Hosnagar Taluk, Shimoga District, Karnataka lies at latitude 13° 55' 00"N to 13° 55' 23.0" and longitude 75° 47' 45.6"E to 75° 47' 46.0"E falling in SOI toposheet no 48K/13.

Background Information:

On 22.12.2009 before the field visit Chairman Western Ghat Task Force, Government of Karnataka briefed about the problems at Ambargudda area. As per the information received from the Chairman of the task force and the local residents the mining activity in the Ambargudda area started during 1960's but stopped due to various reasons. The mining activity again started after 2000 was stopped by agitations from the locals and environmental activists. There was Court interim stay for the mining activity and Forest officials also took a court stay order in this regard. Presently mining company got the permission from the High court for the transportation of the mined ore and the information from the locals is that transportation of mined ore may adversely affect the environment and ecology of the area around Ambargudda.

In this regard Chairman Western Ghat Task Force Government of Karnataka has requested GSI along with other Scientific / Government organisations to assess the area around Ambargudda and to submit a Report thereon.

Regional Geological setting:

The Kodchadri region exposes a group of pre Cambrian meta-sedimentary rocks associated with Iron formations (Banded Magnetite-quartzite), and basic meta-volcanic rocks intruded by dykes. The granite/granite gneiss is probably intrusive in to the schistose group. They all form a part of the major schist belt referred to as Kodchadri schist belt extending along the Western Ghat in NNW-SSE direction, considered to represent the Dharwar System (Sreeramachandra Rao 1971, Davay, D.R. 1968).

The stratigraphic succession deciphered in the Kodchadri region is as follows. (Sreeramachandra Rao 1970)

Dharwar Group	Intrusives	Ferrogenous Laterite, soil
		Laminated & Lateritic Iron ores
		Quartz veins
		Basic Dykes
	Kodchadri Schist Belt	Granite and Granite gneiss
		Quartz-chlorite schist, ferrogenous quartz-sericite-chlorite schist.
		Banded Magantite quartzite
		Ferrogenous quartz-sericite-chlorite schist.
		Banded Magantite quartzite
		Quartz-sericite-chlorite schist.
		Amygdular metabasalt, gabbroid metabasalt

Basement not Known		

Field Observations:

Joint field visit was conducted on 22.12.2009. On the outset the Mining activity is done for Iron ore in very unscientific and unorganised way in the form of deep pits and the mining activity is observed on the mid slope of the hill. The mining activity has certainly caused damage in the form of huge landslide which has occurred during 2004. As GSI is Nodal Agency for landslides our studies was restricted to study and evaluate the slide characteristics, risk involved and suitable future course of action. The Impact of mining on sensitive Western Ghat range can only be arrived by detailed Environmental assessment of the area.

Landslide characteristics:

The landslide is a Debris slide (Photo 1, 2 & 3). The detailed morphometric parameters of the slide are given in Table 1. The debris has moved nearly 100 m downstream and as there is no protective measures to stabilise the slide and every year with rain fall during monsoon the slide is prograding both laterally and longitudinally. The material involved is mainly fragile BIF and the washed away silt is being deposited on the fields and cultivated area of village in downstream.

Cause of the slide:

The Mining activity is the main triggering factor of this slide. The unscientific way of bench and pits made for mining activity has changed the slope geometry. The slide has occurred on the centre of the non-perennial Nala. The area receives heavy amount of rainfall during monsoons, and the fragile nature of the BIF with slope modification for mining activity has caused the slide.

Table 1: Morphological parameters of Land slide at Ambargudda area.

Location		Ambargudda area near Marati Village
Toposheet no		48 K/13
Latitude	Degree	13
	Min	55
	Sec	22.4
Longitude	Degree	75
	Min	47
	Sec	45.9
Elevation(m)		720
Taluk		Hosnagar Taluk
District		Shimoga District
State		Karnataka
Date of occurrence		In 2004
Dimension of slide	Length	> 100 m
	Breadth	15-18 m
	Depth	>12.0 m
Type of slide		Debris slide
History		New
Material involved		Debris involving fragile BIF
Structures affected		Cultivated areas and plantation fields of Marati Village downstream.
Type of Bedrock		BIF
Local geology		BIF
Depth of weathering		>10.0 m
Slope morphometry	Slope prior to failure	45°-55°
	Slope after failure	75°
	Slide Direction	N50° E
Area and shape		Irregular
Crown condition		Unstable
Toe condition		Unstable
Earlier remedial measures		None

Suggestions:

The short term remedial measures for stabilising the slide are as follows:

1. Modification of slope geometry with grading of slope.
2. Erection retaining structure near the stream valley and back filling the slope.
3. Proper surface drainage to be provided as the nala is flowing on the debris.
4. As the whole Ambargudda area's slope geometry is disturbed by mining activity and if mining activity is continued there are several weak zones wherein new landslides may occur.

It is recommended that after detailed study long term remedial measures can be given.

With regard to the environmental aspect and ecological problems created in the area due to mining, a detailed environment assessment study including multidisciplinary sciences may be taken up.

Acknowledgement:

The author extends his sincere thanks to Shri J.Srinivasan, Deputy Director General, Op: Karnataka. & Goa, GSI, Bangalore for his encouragements and support. Thanks are also due to the Chairman Western Ghat task force; forest Department officials, various District officials and villagers of Marati village for providing logistic supports during the field work.

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Sreeramachandra Rao. (1971) Investigation for Magnetite-Quartzite deposits in the Kodchadri block, West coast Iron ore project, Shimoga district, Mysore state, Unpublished GSI report.



Photo 1: The view of Landslide caused due to mining activity at Ambargudda area.



Photo 2: The Run out zone of the Landslide caused due to mining activity at Ambargudda area.



Photo 3: The Depletion zone of the Landslide caused due to mining activity at Ambargudda area.



Photo 4: Discussions with District officials and Locals during field visit at Ambargudda area.

