CHAPTER VIII

For every successful quarry operation marketability plays a vital role in the global trade. Marketability of good products is life blood and nervous centre for success of any business. Healthy marketing trends make business people affluent and provide large scale employment opportunities. Granite industry being a prominent industry requires a thorough review of marketing trends, policies and problems. As such, an attempt is made in this chapter to classify the DSG and to throw light on the price index resource and revenue potential, rate of recovery and also to arrive at solutions to the various marketing problems of the granite industry in Chittoor district.

A decade back, the demand for the granite products was limited to a particular usage as a monumental stone. Since then, the granite industry was mainly depending on the export of rough blocks to various countries. But, during the recent past relaxation of foreign policy and liberalization of industrial policy of Government of India who have been importing the quarry equipment as well as the equipment for cutting and polishing for better value added products, had made the Government of Andhra Pradesh to timely understand the demand for the granite products in the international market as well as in the internal market and it announced the granite policy in 1985 for developing the granite industry in the state and for exporting the value added products and also earning foreign exchange. After introducing the granite policy by the government of Andhra Pradesh, there was appreciable growth for the industry and also usage of granite products within the state as well as in the country. The cost of the granite products has also come down as they were indigenously cut and polished and also due to the demand in the market. Due to metamorphic changes in the cutting of granite blocks with kerosene based machinery which are available at a low price, the granite products were sold at a responsible price. The usage of granite has also been increased in the recent years.
The success of granite business depends on many criteria, fetching higher values for the excavated blocks in the international market scenario especially for the colour granite deposits. It is mostly based on the uniformity in colour, grain size, texture, design size of the blocks, besides lesser percentage of black opaques, segregation, inclusion and other inherited defects. Likes and dislikes may vary from buyers to buyers, countries to countries. The success of commercial stone industry solely depends on success in the recognition of defects in rock/stone. Natural defects in ornamental/commercial rock deposits adversely affect the quality of rock deposit. Detection of natural defects in decorative and dimensional stone industry play vital role in the quality assessment.

Description of Dimension Stone Granite (DSG) Deposits of Chittoor District:

Chittoor district endowed with innumerable number of dolerite dykes serving as Dimension Stone Granites has become world famous because of its granite polishing industry. The district has maximum concentration of dykes with 3 to 4 dykes/sq km. Granite industry in Chittoor district is a major industry with a many of mine owners representing an affluent group providing large-scale employment.

Those dolerite dykes running in the East-West direction are preponderant over those running in other directions in the district. Some of them originate in Tamil Nadu State in the East, enter into the Chittoor district and leave the State towards west to enter Karnataka State. Some of the prominent dolerite dykes such as G-20 run over a distance of about more than 100 km. An E-W trending dolerite dyke running for about 20 km along length and a width of 50 to 100 m was first quarried near Gudipala, south of Chittoor town. The dyke is intrusive into the PGC and occurs as detached linear mounds. The dyke is under exploitation at nearly 30 places. The rock is medium to coarse-grained and relatively black based and containing nearly equal amounts of plagioclase feldspar with anorthite content of 40 to 55% and
augite with minor amounts of opaques, olivine and quartz. It shows sub-ophitic
texture. Augite is uralitised while plagioclase shows patchy saussuritisation.

The dolerite dykes may occur in level land or rise above the
surrounding land as hills with a height ranging from a few to over 300 m.
Exploration is rather easy when the dyke rocks are exposed without vegetation
(Plate XIII.,Fig1), but becomes difficult when covered with thick vegetation
(Plate XIII., Fig 2). It is noted that most of the productive dykes in the district
lie in the reserved forest areas and covered with thick vegetation. Apart from
difficulties faced in their exploration, it is very often difficult to get clearance
of the Ministry of Environment and Forests for obtaining mining leases for
taking up mining.

DSGs occur in the field as boulders and sheet rock. Some of the
boulders occur as huge cubical blocks that could be mined easily as dimension
stones {Plate XIV., Fig1}. Not all the dolerite dykes are amenable for quarrying
as DSGs. For example, some of these dolerite dykes are so intensely fractured
that they are not fit to be quarried as DSGs, but could be mined only as road
metal {Plate XIV., Fig2}.

Boulders on the surface are normally taken as indicators of the
presence of the deposit beneath, without taking into consideration whether the
boulders are in situ or transported. Only when the boulders are in situ, sheet
rock continues to occur after mining the boulders; and the deposit can then be
mined to any depth limited only by technical or economic feasibility. Once it is
established that there is considerable sheet rock deposit that could be mined,
mechanized or semi-mechanized methods are used to mine the deposit. When
such infrastructure is created in areas where the boulders are of transported
nature, the mine owners face enormous loss in the absence of sheet rock of
requisite quality underlying the boulders {Plate XV., Fig1}.

The granite of different varieties produced from the Chittoor district is
being used in different forms. Polished granite are used as markers,
monuments, memorials and cenotaphs, construction of elaborate and expensive
monuments and in some prestigious constructions for paneling materials and
for other decorative purposes. Indigenously the cut and polished stones are used as kitchen slabs, sinks, paneling materials and for other decorative purposes. The black granite or G-20 available in the district is having a steady market and it is being exported to Japan and Taiwan. The future of Indian granite trade in the world granite market is very promising in countries like Italy, Germany, Japan and Taiwan which are quite willing to purchase different varieties of dimensional granite blocks especially from Chittoor district. The Chittoor district black granite or G-20 has evergreen market in the world trade since this type of black granite deposits are being supplied continuously in the world market. Specifications are mostly in the nature of aesthetic qualities such as design, surface appearance, uniform colour, contrasting shades, absence of hair cracks, flowers, and white spots etc which control the quality of the granite.

The importing countries lay emphasis on uniformity of colours. In Japan, the black granite is having steady market as the people attach sentimental value for black besides its uniformity in colour and texture. In countries like Korea and Taiwan, the buyers preference is for red and pink with porphyritic texture such as Ruby red, Tiger skin, etc. In European countries, the liking is mainly for fast colours such as combination of the pink, grey and white with few designs such as Paradise, Kasmir white, Ruby red, Blue fantasy; the Italians and some of the west European countries prefer large sized blocks to suit giant size cutting machines. In general buyers prefer blocks of bigger size measuring 240x120x80 cm for feeding are gang saws {Plate XV., Fig2}. The volume of 0.3 cbm is called “Random” and the size below it is called “monument” (Saravanan, 1995).

**Classification of dimensional stone black granite deposits (DSBGD):**

In Dimension stone industry irrespective of origin and mode of occurrence the black granite deposits in chittoor district are broadly classified into four varieties. The capacity of taking polish,(reflectivity) glassy finish and recovery percentage is directly proportional to the hardness factor expressed (Srinivasan, 1995)
1. **Black granite (or) G-20:**

One of the very important black granite deposits in Chittoor district is Chittoor black or G-20. In the district, Chittoor black or G-20 quarries may be around 20% without any joints and enclaves. The blocks developed to a length of 1.8 meters and above are having export value. During the period from 1980s to 1985, the granite industry in the district has picked up and with availability of indigenous machinery, the entrepreneurs have come forward to develop this black granite of DSG, cutting and polishing units. As a results over 115 granite cutting and polishing units have been established mostly as small scale industries (SSI) and a few as 100% export oriented industrial units.

2. **Tiger black:**

Among black granites in chittoor district Tiger black variety with medium grained and inequigranular texture with phenocrysts of feldspars has been promoted in the trade parlance as “Tiger black” (mid night stone). These types of deposits are widely occurring in the district and are being exploited at low phase. The availability of this type deposits in the district is as shown in the Annexure.

3. **Special Tiger black (or) Yak:**

Among Tiger black granite deposits, a special variety of Tiger black with little different mineralogical assemblages has been promoted in the commercial parlance as “Yak” and it is occurring in a very restricted area.

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<table>
<thead>
<tr>
<th>Variety</th>
<th>trade name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chittoor black (or) Black granit</td>
<td>G-20</td>
</tr>
<tr>
<td>2. Tiger black</td>
<td>midnight stone</td>
</tr>
<tr>
<td>3. Special variety of Tiger black</td>
<td>Yak</td>
</tr>
<tr>
<td>4. Greenish black</td>
<td>greenish black granite.</td>
</tr>
</tbody>
</table>
4. Greenish black:

Among the black granite deposits less prominent deposit is greenish black granite which is exposed widely in the district. But certain greenish black dykes with fine grained texture are having commercial value.

There are other varieties of black granite deposits available in the district. But marketability of these varieties is very less due to their colour and texture and also non availability of big sizes. Though there are large size deposits of this type at present they are not being marketed. However, there is scope in future for developing these deposits. Even some of the marketable deposits are not being worked due to location and non availability of good transportation system. The ultimate aim of mining is to establish the marketability of the product. This is done by polishing the samples of the granite mined before taking up large scale mining. Plate XVI., Fig1& Fig2. Plate XVII., Fig1& Fig2 show how elegant and marketable the polished surface looks of some G-20 and Tiger Black DSGs for taking up large scale mining. Failure to establish the deposit's ability to give rise to high-quality polished surface before taking up mining of a DSG has led to enormous losses in the past.

Market value of DSBGD:

The details of various varieties of black granites available in the district and their market value and countries which are importing are detailed in the table.

<table>
<thead>
<tr>
<th>Variety of Black Granite</th>
<th>No. of quarry leases granted</th>
<th>extent covered in hect.</th>
<th>marketing value in US dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chittoor black G-20</td>
<td>37</td>
<td>72.764</td>
<td>500 to 550</td>
</tr>
<tr>
<td>2. Tiger black</td>
<td>10</td>
<td>15.716</td>
<td>450 to 725</td>
</tr>
<tr>
<td>3. Special variety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tiger black (or) Yak</td>
<td>2</td>
<td>5.000</td>
<td>900 to 1200</td>
</tr>
<tr>
<td>4. Greenish black</td>
<td>40</td>
<td>41.724</td>
<td>400 to 500</td>
</tr>
</tbody>
</table>
Price index:

Among the varieties of black granite dimensional stone occurrences in the research area, G-20 varieties are having perpetual market demand for mass consumption at low selling rate. Depending upon the quality, quantity and size of the black granite the export price ranges between USD/CBM, black granite (or) G-20 is having immense market potential capable of fetching export price of 500 to 550 USD/cbm, on FOB port. Tiger black have only seasonal demand and having price of 450 to 725 USD/cbm. Another one variety, the special Tiger black variety ‘YAK’ is having price of 900 to 1200 USD/cbm.

Resource and revenue potential:

Apart from the known occurrences, seven new virgin areas, potential zones/blocks are identified, delineated and demarcated for their future commercial exploitations. Depending upon landforms, massivity and structural features, the recovery percentage varies from one dimension stone to another. Resource estimation of all categories of dimension stones (working/non-working Dimension stone/stone quarries and virgin areas) in the area of field study shows. An average recovery of 10% to 15% up to a depth of about 20m.

Rate of recovery percentage up to 20 m depth:

- Working Dimension stone quarry : 15-20%
- Nonworking Dimension stone quarry : 12-15%
  Abandoned Dimension stone quarry : <10%
- Working stone quarry : 5-10%
- Non working stone quarry : 4-5%
- Abandoned stone quarry : < 4%
- Surface outcrops (virgin areas) : > 10%
- Hidden deposit : < 4%
- Bouldry outcrops : > 5%

Area delineated/demarcated for DSG area: 775Sq km
Buyer's preference:

Although, the export price of rough blocks quarried in the area of field study is primarily based on the colour and design pattern, it is also necessary to satisfy the following requirements/features for obtaining a buyers firm approval, such as, uniformity in colour, grain size and design pattern. Less concentration of black patches, hair line cracks/hacklay fractures, seconday fillings such as quartz, potash, calcite, epidote fillings/veins may leads to the rejection of the block well dressed gang-saw sized blocks with perfect corners and sides are preferred.
Fig. 1: A boulder outcrop of black granite without vegetation at Ramakrishnapuram.

Fig. 2: A boulder outcrop of black granite amidst thick vegetation at Nellipatla.
Fig. 1: A boulder outcrop of DSG of black granite amenable to obtain large cube-shaped.

Fig. 2: Fractured DSG quarry operating for road metal.
Fig. 1: A sheet rock of requisite quality underlying the boulders.

Fig. 2: Buyer's preferable blocks of DSBGD.
Fig. 1: A black granite deposit at Pandillapalli, which on polishing revealed that it could be quarried to obtain good-quality Tiger Black Dimension Stone Granite.

Fig. 2: A black granite deposit at Putramaddi, which on polishing revealed that it could be quarried to obtain good-quality G-20 Dimension Stone Granite (DSG).
Fig. 1: A black granite deposit at Allamadugu, which on publishing revealed that it could be quarried to obtain good quality G-20 Dimension Stone Granite (GSG).

Fig. 2: A black granite deposit at Naragallu, which on polishing revealed that it could be quarried to obtain good quality G-20 Dimension Stone Granite (DSG).