CHAPTER - VI

LOCATION OF MINI CEMENT PLANTS IN INDIA
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The location of mini cement plants could be considered to fall into the following categories:

1) Large limestone deposits where no railway lines exist or will be forthcoming in the near future. The examples of such areas would be:

a) Kutch and Sabarkantha districts of Gujarat State
b) Bastar area of Madhya Pradesh
c) Hill areas of Uttar Pradesh such as Dehradun, Kumainhills (Pithorgarh), Nainital etc.
d) Rewa district of Madhya Pradesh
e) Dhar in Madhya Pradesh
f) North Eastern region.

Such areas have the scope and potential to sustain a large number of units confined only to the requirements of the market around the locations.

2. Scattered or isolated small limestone deposits eg:

a) Banaskantha district of Gujurat
b) Pondicherry
c) North Bengal hills
d) Parts of Rajasthan such as Alwar, Jaisalmer

e) Parts of Gujarat such as Kim

f) In the Metamorphic or crystalline areas in Tamil Nadu, Karnataka and Rajasthan.

3. Parts of the large limestone basins away from the railway lines. The example of this type could be:

a) Areas of Cuddapah and Kurnool district of Andhra Pradesh

b) Parts of Mirzapur district of Uttar Pradesh

c) Gulburga district of Karnataka.

4. At the places of availability of alternate sources of raw materials other than limestone deposits eg:

a) Calcareous bye-product at plants in Kota, Rajasthan

b) At fertiliser units such as near Baroda, Bombay etc.

The Lokapur Cement Private Limited, the subject under reference, comes under the second category of the type of location discussed above.

In the interest of the rapid increase of cement production by mini cement plants taking advantage of its relatively small gestation periods, the country could be broadly divided into two areas:
a) The limestone bearing areas and

b) The areas with no limestone.

The cement requirements of the limestone area could be met exclusively with mini units, from road transport. Large plants located on railheads from within the limestone areas should be called upon to market all their products only to the areas where there are no limestone deposits.

There are areas in the northern parts of the country where there are no limestone deposits and no railway lines. The additional cost of transporting cement from the nearest railhead will have to be borne by the road transport.

From the point of view of the cement consumer, there would be therefore, three types of area in the country:

a) Limestone bearing areas where mini cement plants could be set up to bring about quick and prompt self-sufficiency in cement. The price of cement in the free market would be the lowest here.

b) Areas containing no limestone deposits but having railway lines — here the cement produced from large plants of one million tonnes could be delivered by rail-transport as plants are set up now. The price of
cement in such area would be higher than that in the areas mentioned under category (a) above but it would be uniformly the same on account of current practice of freight-equilisation.

c) Areas having no limestone-deposits and with no railway lines close by - if road transport facilities connect some of these places to railheads, the cement for the consumer here in the free market would be costlier than that of the area under category (b) above.

The Lokapur Cement Private Limited under reference belongs to the first category stated above.

The scope for mini cement plants would be maximum in areas coming under category (a).

The Geological set-up):

The limestone deposits in the state belong to the middle Dharwar, Bhima series and Kaladagi series of the Indian Geology.

The limestone deposits covered under the three series spread over Gulburga, Bijapur and Raichur districts encompassing an area of 5120 square kilo-meters and are most extensive ones in the country. These are structurally
undisturbed and very consistent in quality and have been
categorised as simple deposits as per National Council for
Cement and Building Materials (previously Cement Research
Institute of India) norms. The thickness of the limestone
deposits varies from 2 to 56 meters. The major portions of
these deposits have been covered with black cotton soil
varying in thickness from 1 to 4 meters.

The Kaladagi Series:

A group of formations, bearing close resemblance to the
Cuddapahs is found between Kaladagi and Belgaum in Karnataka,
known as the Kaladagi series. They are divisible into the
lower and upper series. The lower Kaladagi series comprises
basal Conglomerates and quartzites with banded Jaspher
pebbles, cherty siliceous limestones, shales and
limestone-beds.

The upper Kaladagi series are of restricted distribution.
The limestones of lower Kaladagi series are well exposed in
Belgaum and Bijapur districts. The limestone deposits of this
basin are structurally disturbed to a lesser extent compared
to those of the Dharwar series, have been categorised as
simple to complex deposits and are associated with bands of
dolomitic limestone. In some cases small irregular patches of
dolomite occur within the limestone bands. There are three distinct varieties of limestone in the basin.

a) Grey to bluish grey limestone which is generally of high grade (B F and SMS)

B) Pale blue, light pink, olive green and white coloured limestones which are generally high in silica and are of cement grade.

c) Brown limestones are interbedded with shale bands. The other rock types adjoining the limestone deposits are quartizites and shales.

**Distribution and description of the limestone deposits:**

The limestone deposits in Karnataka are distributed in Chitradurga, Tumkur, Bellary, Shimoga, Gulburga, Bijapur and North Canara districts.

**Bijapur district:**

In this district important limestone deposits are mainly located in the Talukas of Muddebihal, Bagalkot, Mudhol and Sindgi. The limestone deposits of Muddebihal taluka belong to upper Bhima series, whereas the limestone deposits in Bagalkot, Mudhol and Badami talukas belong to Kaladagi series. The reserves of limestone available with these areas are:
Kaladagi Series:

The important occurrences of limestone belonging to Kaladgi series are found in the talukas of Bagalkot, Mudhol, Bilagi and Badami.

In Mudhol taluka which is under reference extensive deposits of high grade limestone suitable for fluxing and cement manufacture occur at a number of places.

Near Lokapur where the Lokapur mini cement plant is situated, the limestone bearing belt is 8 kilo-meter long and 1.6 kilo-meter wide and the beds show a stake along North West - South East steep angles of dip towards the South-West. The limestone occurs associated with shales and slates. Over 20 million tonnes of limestone are likely to be present to a depth of 15 meters.

The Geological Survey of India and The Department of Mines and Geology have carried out prospecting and exploration of limestone deposits in this district. The Geological Survey of India carried out traverse mapping over an area of 490 square kilo-meters (1:63,360) covering Kalasakop and Lokapur areas in this district. Nevertheless, large scale mapping undertaken on a scale of 1:3,960 and prospecting by
trenching, pitting and groove-sampling at suitable intervals was carried out. About 1,060 groove-samples were collected and analysed. Nonetheless, an area covering 350 square kilo-meters at Gaddankeri, Murenal, kesanur, Chickshellikere, Hireshellikere, Nirubudihal and Kaladagi was explored. During reconnaissance survey, a Geological map on a scale of 1:63,360 was prepared. Subsequently, a block of 80 square kilo-meters was selected for detailed survey and mapping. A Geological map on a scale of 1:7920 was prepared to demarcate the grey limestone bands. This was followed by a detailed exploration of the area of 7 square kilo-meters, which included detailed Geological mapping in 1:1000 scale, 22,000 cubic meter of trenching with 1,772 groove samples, 94 boreholes for a total meterage of 8,921.9 meter with 2,719 core samples. The chemical composition is as follows.

Table 6.1 : Chemical Composition of limestone

<table>
<thead>
<tr>
<th>CaO%</th>
<th>SiO₂%</th>
<th>MgO%</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.0-52.0</td>
<td>3.0-11.0</td>
<td>1.0-4.0</td>
</tr>
</tbody>
</table>
Table 6.2: Chemical Composition of limestone

<table>
<thead>
<tr>
<th>Name of the deposit</th>
<th>Quality (%)</th>
<th>Reserve (Million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CaO  MgO  SiO₂  Al₂O₃  Fe₂O₃  LOi</td>
<td></td>
</tr>
<tr>
<td>Kaladagi</td>
<td>50.34  1.39  3.82  1.69  0.72  41.12</td>
<td>19 indicated</td>
</tr>
</tbody>
</table>

Source: Comprehensive Appraisal of Cement Grade Limestone Deposits of India, January 1988, NCB-New Delhi (unpublished)

Table 6.3: Reserve Requirements for various capacities of Mini-cement plants:

<table>
<thead>
<tr>
<th>Category of Reserves</th>
<th>Quantity Million Tonnes.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30 TPD  50 TPD  100 TPD  150 TPD  200 TPD</td>
</tr>
<tr>
<td>Indicated</td>
<td>0.71  1.18  2.36  3.54  4.72</td>
</tr>
<tr>
<td>Inferred</td>
<td>0.50  0.83  1.65  2.48  3.30</td>
</tr>
</tbody>
</table>

Source: Comprehensive Appraisal of cement grade limestone deposits of India, January 1988, NCB, New Delhi (Unpublished)
Table 6.4: Reserve and qualitative analysis of Mudhol Taluka (Reserves in million tonnes)

<table>
<thead>
<tr>
<th>Taluka</th>
<th>Locality</th>
<th>Measured</th>
<th>Indicated</th>
<th>Inferred</th>
<th>Total</th>
<th>CaO</th>
<th>MgO</th>
<th>SiO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mudhol</td>
<td>Halki</td>
<td>-</td>
<td>-</td>
<td>109.00</td>
<td>109.00</td>
<td>47.52</td>
<td>0.4</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>Jalkatte</td>
<td>7.0</td>
<td>-</td>
<td>35.00</td>
<td>42.00</td>
<td>49.00</td>
<td>0.5</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>Lokapur</td>
<td>64.66</td>
<td>-</td>
<td>-</td>
<td>64.66</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Muddapur</td>
<td>43.00</td>
<td>83.00</td>
<td>-</td>
<td>126.00</td>
<td>46.00</td>
<td>4.5</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Kerkalmatti</td>
<td>6.00</td>
<td>-</td>
<td>-</td>
<td>6.0</td>
<td>46.00</td>
<td>4.5</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Nirubudhíhal</td>
<td>27.56</td>
<td>-</td>
<td>-</td>
<td>27.56</td>
<td>46.0-</td>
<td>0.5</td>
<td>0.8</td>
</tr>
<tr>
<td>Bijapur District</td>
<td></td>
<td>427.22</td>
<td>230.30</td>
<td>340.34</td>
<td>997.86</td>
<td>427.22</td>
<td>52.0</td>
<td></td>
</tr>
<tr>
<td>Total for Karnataka</td>
<td></td>
<td>8445.05</td>
<td>1376.66</td>
<td>1525.71</td>
<td>11347.42</td>
<td>8445.05</td>
<td>52.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: (Unpublished) Directorate of Geology and Mining of CRI.
Possible sites for mini cement plants in India:

A total of 86 possible sites has been identified by the Cement Research Institute of India based on the data of cement grade limestone deposits available in India. The following criteria have been considered while selecting these sites:

1. Availability of sufficient quantum of cement grade limestone for a chosen capacity, preferably with no or little over burden (less than one meter thick) should be taken into account. For this purpose the norms evolved by the Cement Research Institute of India can be referred to by the table given below.

Table 6.5: Requirement of Limestone Reserves for mini cement plants

<table>
<thead>
<tr>
<th>Category of reserves</th>
<th>Quantity (million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50 TPD</td>
</tr>
<tr>
<td>Indicated</td>
<td>0.90</td>
</tr>
<tr>
<td>Inferred</td>
<td>1.35</td>
</tr>
</tbody>
</table>


2. The reserves for the mini cement plant have been calculated on the basis of its capacity and a life of 30 years.
3. The large deposits of limestone where the reserves amount to more than 10 million tonnes of measured category or 15 million tonnes of indicated category or 20 million tonnes of inferred category have not been considered for mini-cement plants. However, exceptions have been made for such deposits in remote and hilly terrains due to non-availability of sufficient infrastructural facilities required for medium and large plants.

It is necessary to emphasise the fact that the list of sites cannot claim to be exhaustive or the best available in the country. Some entrepreneurs have established their plants with deposits not finding a place in the list and such cases may recur in future. This is very natural, because, not all the limestone occurrences in India not to speak of small and isolated deposits among different rock-type are located or explored so far. One can only expect that with the interest whipped up in mini cement plants, many small deposits unheard of hitherto will be brought to the notice for assessment and possible exploitation.
REFERENCES

1 Doraiswami, M.S., Mini Cement Plants for rapidly increasing cement production in India, National Seminar on Mini Cement Plants, CRI, New Delhi, 1982, p.39.


3 Comprehensive Appraisal of Cement grade limestone deposits of India, NCB, New Delhi, (unpublished), Jan. 1988,