

Alternatives to coral lime in the building industry

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by Chittaranjan de Silva

The best way to reduce coral harvesting, which is causing severe coastal erosion in the southern coastal belt, is through reducing the demand for coral lime, General Manager, Building Materials Corporation Ltd. (BMC), K. Manchanayake said.

He was addressing a workshop on "Alternatives to Coral-Based Lime for the Use in Construction Industry" last week, organised jointly by the National Science Foundation (NSF) and Ceylon National Chamber of Industries (CNCI).

Coral-based lime, he explained, is used in the country as an essential ingredient in the plastering mix, composed of cement, lime and sand. Most of the coral lime produced is used for this purpose and the demand for it could be reduced through alternatives introduced to the plastering mix, Manchanayake said.

He told those engaged in the construction industry, that the BMC in 1985 introduced a chemical, a salt of vinsol resin, which has since been used by the leading manufacturers.

The chemical costs Rs. 85/- per litre today, and an equivalent of one litre could be used in place of 100 kgs of lime in the plastering mix.

He explained that price-wise too the vinsol resin is much cheaper than lime.

The price which a constructor has to pay for the chemical is 1/10 the price he has to pay for lime, which makes the chemical much cheaper than lime.

He urged that the chemical, which is available at Finco Limited and is called 'Fambix Plus', be introduced as a substitute for coral based lime.

Senior Manager, Development Options (Pvt) Limited, P. Steel, during his address said that their should be ways to assess the damage caused to the environment.

Coral mining is one of the major causes of destruction to the coral reefs, with other factors being siltation from river discharge, destructive fishing methods and boat anchorages.

According to the Coast Conservation Department (CCD) data, 1500 people were directly engaged in coral mining, collecting and transporting in 1994. These people earned a monthly income around Rs. 2000/- for a period of four months in a year.

According to him, finding alternative employment avenues for the people are important in minimising the destruction to the coral reefs.

According to the Chairman National Science Foundation, the role of the geologist is vital when choosing raw materials for the construction industry.

Sources of lime in Sri Lanka

Director, Geological Survey and Mines Bureau, Dr. N. P. Wijayananda, explained that the two sources of coral based lime available in the country are the coastal reefs and the inland deposits of coral.

He expressed concern over the mining of coastal reefs. Reef coral, according to him is slow growing and cannot keep up with the increased demand caused by the pace of economic development.

The demand for coral-based lime is greater than the supply, Dr. Wijayananda added.

He said that the mining of inland coral reefs, which results in large unfilled pits, has also caused environmental problems.

There is a need to find more economically viable resources, he said, in place of coral-based lime.

Dr. Wijayananda said that limestone deposits, which are present in the coastal belt running from Puttalam to Jaffna peninsula, could be identified as sedimentary rocks containing calcium carbonate.

He said that the other source for lime in the country is dolomite $[\text{CaMg}(\text{CO}_3)_2]$, which contains upto 22% MgO .

If the Magnesium content of dolomite is low, he said that it can be burnt to make lime suitable for construction, while the higher Mg content Dolomite could be used for fertiliser.

The industrialists prefer coral lime to dolomitic lime purely for economic reasons, he pointed out.

Lime for miocene limestone, when using for colouring is not pure white, which is another reason that the constructors go for coral, he added.

Other uses of lime

Head, Materials Technology Division of the Industrial Technology Institute (ITI), Dr. M. G. M. U. Ismail, said that lime which is mainly used in the construction industry in Sri Lanka is also used in the developed coun-



Sea erosion — mainly caused by coral mining

tries in construction, chemical, agricultural, ceramics and metallurgical industries.

Lime is used as a stabiliser in the construction of highways.

Dolomite lime is used as fertiliser as well, Dr. Ismail said.

According to him, to obtain 75,000 tons of quick lime, 150,000 tons of limestone have to be burnt annually.

The present requirement of lime for the construction industry in Sri Lanka is around 150,000 metric tons per year.

Statistics show that about 60% of the yearly requirement is met by coral limestone, while the balance is through dolomite, he said.

He further said that in addition to the use in building industry, 5000 tons of coral lime

are used per year in the form of hydrated lime in water purification plants.

Dolomite lime producing kilns are located only in the Digana and Matale areas, and the transportation costs add up when it is brought to the southern areas, he explained.

Comparison of the properties of dolomitic lime and coral lime

During heating, the magnesium carbonate fraction in Dolomite decomposes first at a temperature of 750 centigrade and then the calcium carbonate fraction breaks at 900 centigrade.

He pointed out that the final yield in hydrated lime is very low in the case of dolomitic lime, compared to coral quick lime.

The mineral impurities and compositions of dolomite vary from Matale to Digana,

altering the temperatures of decomposition.

This causes problems when hydrolysing.

Some of the problems concerned with dolomitic lime are: the overburning of magnesium, difficulties in hydration and the yield being low compared to coral lime.

The lime yield in dolomitic lime is around 50% less compared to coral lime.

According to Dr. Ismail, the quality of dolomitic hydrated lime available in the market is poor.

Lime with a better yield could be obtained through an improved calcination and hydration method.

Correct particle size and control of temperatures, which should be found through research, are necessary to obtain high yields, he added.