Off-Shore Sand as and Alternative

Thilina Gamage

D D Somaweera Chandrasiri

Sand mining from riverbeds has been restricted due to various environmental issues and for this reason those engaged in the construction industry are finding it difficult today to get adequate quantities of sand, in time. As a solution for this problem, the Sri Lanka Land Reclamation & Development Corporation has commenced marketing a stock of off-shore sand. D D Somaweera Chandrasiri, Chairman and Thilina Gamage, Working Director of the Ministry of Urban Development & Water Supply spoke to Business Today about this new venture.

On what basis, was the concept of using off-shore sand as an alternative for river sand in the construction industry, formed?

Sand is one of the main ingredients used in the process of constructing buildings and it is usually taken from rivers. However, due to various environmental problems caused by incessant sand mining from riverbeds, mining in this way now faces restrictions and barriers and was also to be prohibited by law in the past. Therefore, there were difficulties among suppliers in satisfying the growing need for river sand, resulting in a crisis in the construction industry. What’s more, a cube of sand was being sold at a sum of Rs.7000. Due to continuous mining, rivers have become

deeper causing sea water to. filtet into them making its waters salty and undrinkable. The Kelaniya River was especially affected in this way. During this time of crisis, a stock of off-shore sand lay piled up at Kerawalapitiya in Muthurajawela -a stock that was to be used for the construction of the Colombo-Katunayaka highway. Having being tested by both the Civil Engineering Department of the University of Moratuwa and the National Buildings Research Organization, the sand was found to be perfectly suitable to be released for construction purposes. It was thus that we decided to release the stock of sand to the market. Our main aim in doing this is to reduce the present shortage of sand in the construction industry. Such a shortage arose because a lot of building needed to be done immediately due to last year's tsunami disaster. We wanted to supply the needed sand easily and as soon as possible and that was the reason for the initiation of this project.

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The salt content in off-shore sand is higher than that of river sand. Is it suitable to use sand with a high salt content for construction purposes or is it subjected to a process of being made appropriate?

Off-shore sand is not suitable for immediate use due to high salinity. We do not even get this sand from the beaches- this stock of sand was pumped from a distance of about 10 kilometres away from the shore. It was found by the University of Moratuwa that when subjected to 1000mm of rainfall yearly, the salt content in the sand is naturally washed away. If not, the sand should be washed out using artificial methods but such methods are not necessary as the rainfall in Sri Lanka exceeds 2500mm per annum. After being pumped out, being left to wash by rain for a period of 5-6 months is perfectly sufficient. Continuous tests have shown that the pile of sand at Kerawalapitiya, after being exposed to monsoon rains for a period of about 6 years, has now been almost completely rid of its salinity. Another thing that consumers should know is that most miners pump river sand from the mouth of estuary's and that the salt content in that particular sand is high. So unknowingly the sand that is already being used too has a high salt content and putting this fact into consideration as well, tests have shown that comparatively off-shore sand is much suitable for construction purposes.

Is the stock of sand in Kerawalapitiya sufficient to satisfy the existing

need in the market?

If the consumer uses off-shore sand only and keep away from river sand completely, it will truly be insufficient. In the western province itself there is a yearly need for 4 million cubic meters of sand. Having released only 700,000 cubic metres to the market, the existing stock of sand is not even sufficient for only the western province itself. But this is a new concept and those who are involved in the construction industry still have certain doubts and fears about the suitability of this sand. evertheless, according to our sales reports it is evident that each day the need for it is growing. There is a site at Nawala in Kirimandala Mawatha where this sand can be purchased in retail form. The sand is produced from the stock in Kerawalapitiya and it is reported that 300 cubes are sold daily. Sand mining is most suitably done when the sea is calm and so it is not possible for us to mine at any given time of the year. However it is currently being done.

Apart from the two sites in Kerawalapitiya and Nawala where off-shore sand is sold are you expecting to have other such places where it will be made available?

In the near future, the sand will be made available through authorized distributors in Kelaniya, Wattala, JaEla, Nugegoda, Maharagama, Moratuwa and Mount Lavinia. The sand is chiefly being used for tsunami reconstruction projects and currently being transported to Galle and Matara by train; a rather expensive method. Another thing that should be mentioned is that since the construction of the Colombo-Katunayake highway ;vill commence soon, we have embarked on a legitimate tender procedure to initiate a project to once again pump off-shore sand. This prompted the contractor to transport two ships loads of sand for free, so in about a month’s time we should be able to distribute sand to Galle and Matara at a cheaper rate.

How much has the government invested in this project so far?

This project is one that is being implemented as a solution for the national problem. Permission to release this stock of sand that was meant to be used for the construction of the Colombo-Katunayaka highway was given to us by the former Prime Minister and Minister of Roads and Highways Honorable Mahinda Rajapakse. The release of the stock, process of re-pumping and ensuring the continuation of this project was made possible by honorable Minister Dinesh Gunerwardane who brought forward a cabinet paper regarding these matters. It was former President

Chandrika Bandaranaika Kumaratunga who gave the cabinet papers vesting the required power on our corporation, so that we would be able to direct this sand to tsunami construction efforts at a lower cost. It was with the blessings of the above that we were able to go ahead with this project and they should receive due credit.

What were the challenges of this offshore sand mining project?

We do not have a dredger that is suitable for mining off-shore sand, so it is being done by a contractor who we found through the tender procedure. It cost a total of Rs.1 billion and we can only bear this amount with the governments involvement. If we were able to acquire these instruments through some loan scheme or donation, we would be able to supply the sand at an even lower rate. Currently we are using alternative methods to meet with this cost and if the government does get involved, then we should be able to give this benefit to the people.

Many job opportunities arose with the mining of river sand but in this case it seems to be limited. Could you tell us how local manpower is used for this project?

It is true that this project is being handled by a foreign company. But after the process of mining the sand, it has to be transported, distributed and sold in both the forms of retail and stock. All this requires the manpower of the locals and it thereby provides job opportunities for the locals. However I think its unfair to judge the success of a new concept like this on the number of job opportunities formed.

We do not pump sand that is close to the shore, as that will cause the sand on the beaches to wash off into the sea resulting in sea erosion. We get the sand from the deep sea about 10-12krn away from the shore and that too cannot be done from any given place -it has to be pumped from places identified as suitable through research. Our corporation is the only firm in Sri Lanka that is licensed to pump off-shore sand. As a responsible government office, we have consulted and received the approval of environmental authorities, the Ministry of Fisheries and Department of Coast Conservation to pump sand from recommended places so there is no way that erosion can possibly occur. In most countries it is off-shore sand that is used for the construction industry, so this is not something that is being done for the first time; countries like Japan, Korea, Singapore, India, Hong Kong, Malaysia and more use off-shore sand for construction purposes.

Is it only Kerawalapitiya that has been identified so far as suitable to

pump sand from?

It is mainly this Kerawalapitiya area that has been identified as suitable so far but we are doing research to find out if its possible for us to pump sand from the sea alongside the western province. It is not possible to pump sand from wherever we please. A considerable area of empty space is required close to the sea where the sand can be pumped to and its difficult to find such places in areas like Galle and Matara but in Kerewalapitiya we have the desired requirements.

What are the benefits of using off-shore sand?

According to the research and experience of Professor Priyan Dias of the University of Moratuwa, the sand taken from the site at Kerawalapitiya is stronger and thereby better for construction purposes than that of rivers. The quality of river sand is also said to be similar in almost every way to that of off-shore sand. According to British Standards, the seashell content in the sand should be – for less than 5mm has no limit, between 5mm and 10mm should be less than 20%, and more than 10mm should be less than 8%. An estimated amount of 8-10% of seashells in sand is said to make concrete stronger. The sand at Kerawalpitya has a seashell content of 8% and so Professor Dias ensures that it will be very suitable for the making of concrete. When looking at it financially, we are able to give off-shore sand at a lower rate compared to river sand. We now give a cube of off-shore sand at the rate of Rs 2,500 to Rs 3,500 and it is also sold in both retail and stock form. We even provide transport if necessary.

In any case, mining river sand will be very limited in the future due to environmental issues so this is the only alternative that we have. We have organized a workshop for consultants, engineers and others involved in the construction industry to make this concept known. We have also taken steps to create awareness by distributing leaflets and through print and electronic media.

Are there any the other projects taken up by your corporation that are related to this one?

Our future goal is to obtain the instruments required for mining offshore sand and continue with this project. As the Land Reclamation and Development Corporation, we only reclaim low land within the country and it has its limits. As an alternative we are currently doing research to attempt reclamation in the sea- something that is being done so far in Japan, Singapore and Hong Kong.