

CORRESPONDENCE

statement by Nayak *et al.*¹ that 'the entire column of lava below the Koyna region is made up of non-massive vesicular type of basalts' is erroneous.

While proving their point for the non-vesicular nature of basalt below the Koyna region, Nayak *et al.*¹ cite examples of basaltic sections in Latur¹¹ and Bor Ghat¹². However, the authors should examine their observations based on the vast amount of geological information^{2,3,7-10,13,15} already available for the actual study area, rather than citing stray examples of studies carried out elsewhere by other workers.

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Sea-walls – A necessary evil

One can well understand the concern of Shareef¹ for the disappearing beaches in the wake of construction of sea-walls. Whereas fresh building activities have been banned under the Coastal Regulation Zone (CRZ) Act, what about the agglomerations that came up along the shoreline, centuries and millennia ago and are now affected by the advancing sea and the consequent nearing of the monsoon inundation line? Will it be practical and possible for the Government to evacuate and rehabilitate the millions living at the edge of the 7000 km long coastline affected by the landward march of the sea? The 'no encroachment' area proposed by Shareef is a good solution, but too late to be implemented for a densely populated country with a long history.

Vertical walls like the one at Marine Drive, Mumbai, supported by tetrapods, or at Pudukcherry promenade supported by boulders provide good protection, but are expensive. The disadvantage is that the sandy beach is lost as the waves come right up to the wall. These walls need periodic repair as tetrapods and boulders sink in the sand. The cost of repairs to the Marine Drive wall is reported to be Rs 18 crores for a length of 600 m.

Engineers at the Central Water and Power Research Station, Pune, have come out with a design of onshore breakwaters, which in a sense are boulder-walls, for Tithal and Udvada beaches, Valsad district, Gujarat, that are severely affected by sea-erosion. A village in Valsad district, Moti Dandi, has already been washed away by giant monsoon tides. Seven such breakwaters covering a length of 600 m have been constructed on Udvada beach in 1998–99 at a cost of Rs 55 lakhs. This may be compared with the colossal cost of repairs to the Marine Drive wall. The breakwaters now protect the properties at the sea-front.

So far the problem has occurred only during the peak of monsoon: During a storm, atmospheric pressure falls and the sea level rises. Coupled with the high tides of the new moon or full moon days giant waves ravage the shoreline. The northern ends of the breakwaters break down after 3 to 4 years of violent storms and tidal onslaughts. However, any structure that controls such a mighty force needs periodic repairs. Meanwhile, sand keeps on accumulating on the landward side of the walls. Thus the walls 'sacrifice' themselves to protect the town.

An alternative to breakwaters (sea-walls) is the beach nourishment treatment that was proposed for Udvada in order to eliminate the sea-walls. The idea was to dredge the nearby Kolak River and deposit the sand on Udvada beach. Social and ecological problems cropped up in the way of the project. Residents of Kolak village opposed the plan on CRZ grounds. Secondly, the Kolak creek is lined by mangroves, which stabilize its banks. But these salt-water trees are known to react to dredging operations, which alter the ecological conditions of the creek. And with the disappearance of the mangroves, stability of the banks cannot be assured.

Vegetation which is effective in curbing wind-erosion, unfortunately gets uprooted by the force of waves, unless present in protected pockets like mangrove marshes.

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