



Impact of Lithification on Agriculture Along Western Coast of Maharashtra

Wagh Sahebrao K.
Department of Geography,
M.S.G. College, Malegaon Nashik.
E-mail : Sahebraowagh2011@gmail.com

Introduction :

It is the processes by which loose *sediment* is hardened to rock are collectively called rock. Beach rock is bounded by calcareous cement; it is the marine feature mainly in the sense that it is exposed by removal of covering material by waves. The critical condition is ground water temperature both under beach and inland and lime content in sediment (Richard J. Russel & William G. McIntire). The occurrence of beach rock at Barshiv beach is interesting and significant feature. Beach rock indicates paleocoastal environment of that area characterized by regression of sea level. Analysis of sediment of beach rock on Barshiv beach shows that it is composed of more than 60% Calcium Carbonate seems to be common supply of it and acted upon by wave energy. The beach rock exposed parallel to the shoreline behind beach sediment. The width of this rock is 5 to 6 feet.

Keywords : Regression, Beach rock, Dune facies, Transgressive deposits, Beach morphodynamics, Wave energy.

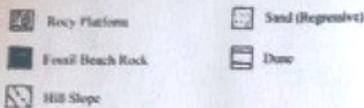
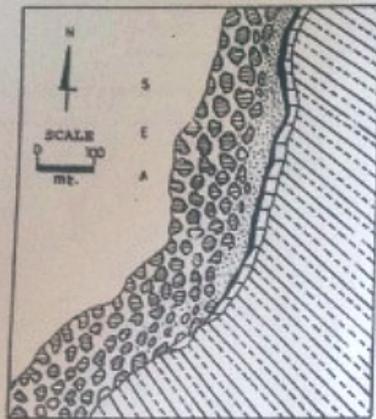
Cementation of beach rock begins along the water table. The initial surface is normally flatter before the stratification of beach sand. Several bands or layers are seen. This is flocky in nature because, it is truncated by wave erosion. The water table commonly is almost flat under a beach and beach rock exposed upward only to that limit (Richard J. Russel & William G. McIntire). Limestone hinterland also favorable but not critical, because in many places the lime is derived directly from shell, coral and similar substances with beach itself. Beach deposits with insufficient shell content are not likely to form beach rock. Cementation will not occur of the outflow through beach is too rapid. The temperatures of ground water present an additional control if the water is too cold it will carry lime away.

study Area :

Beach at Barshiv located in Raigad district on coast of Maharashtra. It is easily approachable from Alibag to the north and Murud to the South. Barshiv is located at 18°26'00" north latitude and 72°55' east longitude. The shoreline of Barshiv is look like a platform with small cliff on the southern side of area. The sediment has a patchy appearance and is distributed on a limit of the high water mark. This sediment area appears to be narrow beach, where sea-ward side is exposed by basal rock and hence this area not only to be a platform but also a beach. It shows boulders, gravels, coarse sand, calcareous shells are scattered everywhere on the beach or platform. Behind the narrow sediment of fossil beach rock is not likely to be exposed on a prograding shore but also exposed by sub-areal processes. Behind beach rock, old lithified vegetative dune ridge, connected with steep slopes of low coastal ranges. A small seasonal stream that originate from this coastal range and join the beach or platform.



GEOMORPHIC MAP OF STUDY AREA
(Barshiv Beach)



KONKAN REGION



Methodology:

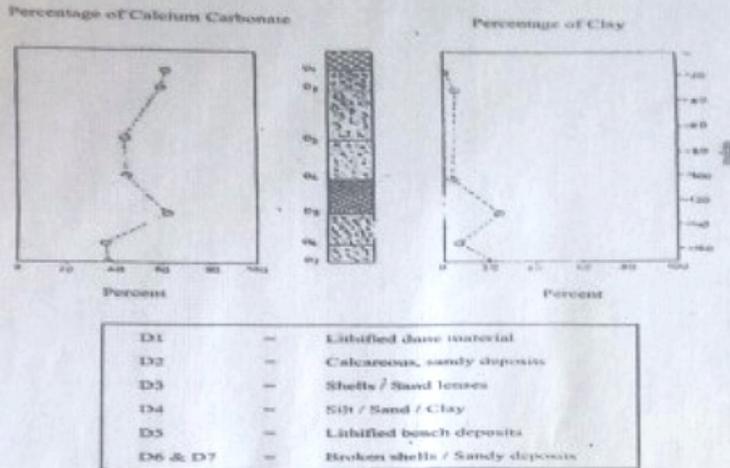
To understand regression of sea level at Barshiv beach the field survey was carried out in September and February. The September observations were treated as representative of monsoon and February observation is representative of post monsoon season in that area. About 13 samples (monsoon) and 22 samples (post monsoon) were collected from this area to study the textural properties of sediment. Sample of beach fossil rocks were taken to understand sedimentology of old beach. To understand the stratigraphy of beach / dune facies six samples taken at various depth up to a present beach level. To study the nature of sediments and extent of deposits on the beach. This sort of study therefore, requires actual levelling of beach profiles by using a leveling instrument like a dumpy level in at least two different seasons. Finally, to identify the sedimentary sequence on level of fluctuation through geomorphological and sedimentological clues. Geomorphologic were prepared for the Barshiv beach.

Vertical Profile of Beach/Dune Facies :

The surface and subsurface sediment (stratigraphy) of dune was studied carrying varying depth from 0 to 170 cm on the back side of beach, gives in idea of old depositional environment of area. The sand, slit, clay and Shelly calcareous material are the main constitute of depositional sequence. The amount of clay and Calcium Carbonate was analyzed by the method of wet sieving. In the first sample, taken at a depth of 15 cm from the surface, percentage of clay and Calcium Carbonate 3% and 61% respectively. Below it, amount of clay is slightly more (6%) and Calcium Carbonate is slightly less (59%) this material likes a calcareous sandy material in the profile. At a depth of 70 cm Calcium Carbonate is (46%) and Clay is (3%). At a depth of 130 cm, percentage of Clay increased upto (25%) and Calcium Carbonate increased to (63%). And lease sample taken at a depth of 170 cm, at the level of present beach material shows both Clay and Calcium Carbonate (35%) and (10%) respectively. This section consists of broken shelly, sandy deposit material.

**VERTICAL REPRESENTATIVE PROFILE
 OF BEACH/DUNE FACIES
 (Stratigraphy, Near Profile Three)**

Scale X - Axis 1 cm = 20 percent
 V - Axis 1 cm = 20 cm depth



Conclusions :

Sediments over the beach are not well graded. The wave approach in area in both seasons is Southwesterly. Near southern side (headland area) shows coarse sediment. The mean size of sediment indicates coarser to medium sediment locates at the landward side and very coarser to granule deposited at seaward side. The pattern of sediment deposition is complex and creates a lot of problems to interpret sorting index, skewness and kurtosis. There is seasonal variation in amount of sediment only and redistribution take place. There is no definite relationship between Calcium Carbonate and Clay on the beach. The dune on the back of beach is lithified with high amount of Calcium Carbonate. Both Clay and Calcium carbonate increases at depth-wise. The total sand on younger and regressive the beach is coarse indicating that it is.

References:

1. Karlekar S. N. (1993), Coastal Geomorphology of Konkan Aparna Publication, Pune.
2. Ahmed E. (1973), Coastal Geomorphology of India Orient Longman, Bombay
3. Allen J. R. L. (1970), Physical Process of Sedimentation, Allen and Unwin, London
4. Bruckner H. (1987), New Data on Evolution of Konkan (West India), Exploration in the tropics, Edited Datye V. S. et al K.R. Dikshit, elicitation Volume, University of Pune, Pune.
5. Davis R. A. (1978), Coastal Sedimentary Environment, Springer Verlag, New York.
6. Guzder (1980), Quaternary Environment and Stone Age Culture of Konkan Coastal Maharashtra, Deccan College, Pune.
7. Ritter D. F. (1986), Process Geomorphology Brown Publisher, London.

In
 ba
 on
 gi
 pt
 sp
 pi
 K
 D
 K
 fi
 M
 c
 o
 a