in zones of tectonic subsidence and drainage anomalies like compressed meanders, eyed drainages and deflected drainages, diversion of tsunami surge along convex and it's convergence and accelerated inundation along the concave coasts, occurrence of groundwater table as alternate E-W trending ridges and valleys in general and groundwater fall, aquifer squeezing and leakage into ocean along the convex coasts related to cymatogenic arching in particular, backwater shrinkage, siltation and total defunct and withdrawal of creeks in convex coasts/arches, accelerated tidal activities and mangroves in concave/ subsiding coasts, etc

Conclusion

Thus the study has brought out packages of newer information on the post collision tectonics and its direct bearing over various natural and environmental disasters which all warrant deeper studies in the context of rapidly emerging natural disaster scenario and the phenomenon of climate change

SELECTIVE TSUNAMI ATTACKS ALONG SW COAST OF INDIA – HOW & WHY? AND THE ROLE OF TSUNAMI WARNING SYSTEM IN THE SUB-CONTINENT

A C Dinesh, N Maran, A R Nambiar, E Unnikrishnan and C Jayaprakash
Marine Wing, Geological Survey of India, Mangalore
Email: acdinesh@rediffmail com

Extended Abstract

The 26th December 2004 Sumatra tsunami was most devastating in terms of loss of lives, properties and spread In India, east coast was hit by the primary waves without being modified by diffraction/reflection But very unexpectedly, the waves were undergone diffraction and/or reflection and inundated several parts in the southwest coast of India Unlike western part of Bay of Bengal, the eastern part of Arabian Sea is traversed by ridges like - Lakshadweep Ridge, Pratap Ridge, Comorin Ridge etc These ridges have played a major role in modifying the waves The bathymetric data collected onboard GSI vessels support this view Our data on timings of maximum inundation at different places along SW coast are matching with that of N P Kurien et al (2006) From these timings it is evident that the waves have not progressed much towards north from Kanyakumari (beyond Kolachel) Sector wise detailed bathymetry off Chetuwa, Kochi, Ambalapuzha, Alleppey, Kayamkulam inlet show gentle slope towards west Increasing slope was noticed near shore at Kollam and further south The first attack at SW coast was along Kanyakumari-Kolachel stretch This can be explained by the diffraction of waves at Galle(Srilanka) and /or along Comorin Ridge The selective inundations at other places at different timings are attributed to reflection of waves from Lakshadweep Ridge and diffraction/reflection from other ridges on its east and also the very late arrival of waves at few places like Edavanakkad, Anthkaranazhi, Ponnai etc could be possibly due to wave oscillation between the steep Lakshadweep Ridge and Quilon Plateau and adjoining ridge areas

Tsunami Warning System (TWS) is a system with two equally important components- a network of sensors which detect a tsunami and its velocity and a communication network to reach the message to the people at risk India is setting up its TWS in Bay of Bengal and Arabian Sea The Pacific Ocean Tsunami Warning Centre is operational since 1946 which serves as a tsunami warning centre not only for USA but also for 25 member countries situated around Pacific Since earthquake and tsunami are frequent hazards in this area, the detection and dissemination networks have constantly been evolved through decades, where as, tsunami is a rare phenomenon in the Indian sub-continent which is one way a blessing to the people at risk and a curse for the warning system Since tsunami occurs in this part over very long time intervals, like the present generation just before 26th December, 2004, the future generation also will be

Gist of the lecture delivered on 31 January 2007 at the Geological Society of India, Bangalore mostly unaware of its catastrophic effects unless properly and periodically educated. We all know that the education programs and mitigation measures will be kept at a very low profile after few years or decades. A question still arises, after 50 or 100 years the DART sensors which are placed at the deep ocean bottom will be working real time? We have more than 3 million fishermen population and few millions of non-fishermen along the coasts. Evacuation of large number of people within one or two hours is a major task. Hence, forecasting exact location of inundation and its severity is very important. Systematic and high resolution inner-shelf bathymetric data is not available with us and with out which the accurate prediction of the area which would be possibly get affected is extremely difficult. We certainly need a warning system but if there is one it will not be the panacea to prevent the loss of lives and properties in the sub-continent from the fury of tsunami. What we essentially need is, along with the warning system we should *stricto-senso* implement the newly proposed Coastal Zone Management (CZM).

GEOLOGICAL AND GEOCHEMICAL ASPECTS OF THE GULCHERU FORMATION IN THE SOUTHWESTERN MARGIN OF THE CUDDAPAH BASIN AND ITS POTENTIALITY FOR URANIUM MINERALISATION

HIMADRI BASU
Atomic Minerals Directorate for Exploration and Research, Hyderabad – 500 016
Email: basuhimadri@rediffmail.com

Extended Abstract

Geology

Gulcheru Formation (GF) in the Cuddapah Basin (CB) marks the onset of sedimentation after the profound 'Eparchaean' unconformity. It non-conformably overlies (Nagaraja Rao et al. 1987) the gneisses, schists and younger granitoids of Eastern Dharwar craton. In the southwestern margin of the CB, it has a general E-W strike with shallow (8°-15°) northerly dips (Basu et al. 2007). GF is conformably overlain by Vempalle Formation.

Five lithofacies characterize GF (Basu et al. 2007). These in the order of superposition are pink massive quartzite (PMQ), dark brown ferruginous quartzite (DBPQ), grey cross-bedded quartzite (GQ), purple shale-siltstone (PSS) and pitted quartzite (PQ). The lower most unit starts with lensoidal bodies of unsorted epiclastic basal conglomerate (BC). BC, deposited as alluvial fans by debris flows in wadis along the basin margin, may altogether be considered as a different lithofacies. On the basis of detailed facies analysis it is established (Basu et al. 2007) that in the southwestern margin of the CB, GF shows a transition from initial fluvio-aeolian to later marine regime.

GF is traversed by a number of ENE-WSW to ESE-WNW trending strike faults as well as NE-SW trending diagonal, strike-slip faults and is intruded by E-W to ESE-WNW trending dolerite dykes (Basu et al. 2007).

Geochemistry

Major oxide geochemical data (N=65) shows that except for PSS all other lithounits have very high SiO2/Al2O3 values (averages for BC 25.63, PMQ 207.25, DBFQ 39.46, GQ 103.49, PSS 3.96, PQ 137.45) compared to sandstones of passive continental margin (SPCM 9.74) as well as Post-Archaean Average Australian Shale (PAAS 3.32). This depicts their higher order of mineralogical maturity due to recycling and/or intense chemical weathering of source rock. All lithounits except for BC show very high values of Al_2O_3/TiO_2 (averages for BC 6.47, PMQ 32.21, DBFQ 40.02, GQ 52.94, PSS 40.13, PQ 63.75) compared to PAAS (18.90) as well as SPCM (17.16). In successively younger quartzite horizons Al_2O_3/TiO_2 ratio increases, possibly implying the effect of heavy mineral fractionation or hydraulic sorting.

In K_2O/Na_2O-SiO_2/Al_2O_3 bivariate diagram, PSS and to some extent BC show most restricted compositional range, whereas, both of PMQ and PQ have restricted range of SiO_2/Al_2O_3 but show wide variations in K_2O/Na_2O ratio. GQ shows wide ranges of both K_2O/Na_2O. DBFQ shows

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