In this issue

Alarming scarcity of water in India

India is facing a serious problem of natural resource scarcity, especially that of water in view of population growth and economic development. But surprisingly, the recent report of the National Commission for Integrated Water Resources Development Plan (NCIWRDP) states: 'Taking into account the water availability and the requirements till the year 2050, the Commission concludes that there is no need to take an alarmist view'. The article by Garg and Hassan (**page 932**) contradicts it and shows that the utilizable water resources of India are much lower and are overestimated in various studies ranging from 66% to 88%. The authors have estimated the utilizable water resources as 668 BCM against 1110 BCM of Central Water Commission, 1209 to 1255 BCM of NCIWRDP and 1122 BCM of National Water Policy of India. The consequence is going to be alarming as the projected demand of even 897 BCM, corresponding to low demand scenario till the year 2050, cannot be met even after full development of utilizable water resources.

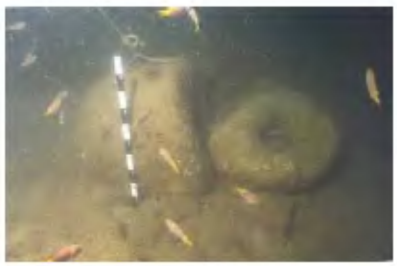
The authors have also provided new estimates of utilizable water resources for each river basin and identified water deficit or surplus basins of India. The study shows that almost all the basins would be converted into water-deficit basins, and raises a big question upon the availability of water through inter-basin transfer.

It is also shown that the groundwater has already been overexploited as back as in the year 1997–98. This is in contrast to Central Ground Water Board that the groundwater development was of the order of 32% and suggested a huge scope for the additional groundwater development.

The findings calls for an urgent action to review and implement the water policies/plans in a time-bound manner in the light of the alarming water scarcity before it becomes unmanageable.

Ancient technology of jetties

Ancient literature and archaeological findings have indicated the existence of several ports, jetties and anchoring points along the west coast of India since the Harappan period. Tidal variation and seabed topography played a significant role in construction of jetties and selection of anchoring points. For example, Gujarat coast does not have jetties built of wood while going down to Maharashtra and Karnataka coast, wooden jetties are operational, particularly in backwater areas for local fishing trawlers and canoes. Indeed, this could be well connected with tidal variations as Gujarat coast by and large has a higher tidal range and the gulf areas. The higher tidal range results in the exposure of a larger beach area and fishermen take their boat till high water line during high tide, and during low tide, boats rest on the sandy beaches. They carry out loading and unloading and also small repairing of boats if necessary, without any kind of structure. This appears to be a very old tradition in Gujarat,



because a large number of stone anchors from inshore as well as intertidal zones of Dwarka, Bet Dwarka and one each at Armada, Tukda and Gopnath have been recorded. Stone anchors are the indicator of the ancient anchoring points and underwater findings have indicated that the preferred anchoring points on the Saurashtra coast falls between 5 and 7 m water depth. See **page 987**.

Genetic diversity in fruit bat *Cynopterus sphinx*

Quantification of genetic variation within and among species is of central importance in conservation genetics and such analyses are necessary for deciphering long-term patterns in the interactions of populations of a species, which is an essential element in gaining a comprehensive understanding of the biology of a species. Karuppudurai *et al.* (**page 942**) show the genetic diversity within and among populations of the Indian short-nosed fruit

bat *Cynopterus sphinx* assessed through Random Amplified Polymorphic DNA (RAPD) analysis. *C. sphinx* belongs to the Old World fruit bats (Megachiroptera: Pteropodidae). It is a common plant-visiting bat that occurs throughout the Indo-Malayan region and roosts solitarily or in small groups in foliage. In this study the authors used PCR-based RAPD analysis because of its swiftness of results, cost-effectiveness and reproducibility and is relatively simple compared to other techniques. The dendrogram and Principal Coordinates Analysis revealed that considerable genetic diversity was observed in this species from different zonal populations, possibly due to complete dispersal of juveniles of both sexes from their natal groups and gene flow between the zones. Finally the authors suggest that the study not only provides a predictive framework for future studies, but also the use of genetic data in the management and meaningful conservation of this species.