

## CORRESPONDENCE

this plant for medicinal use<sup>3</sup>, mostly natural populations are destroyed for the purpose. The plant also has ornamental value<sup>5</sup> and seedlings collected from forests are sold in the market for Rs 20–30 per seedling<sup>5</sup>.

Efforts have been made for the conservation of this rare, endemic and



Pitcher and fruits of the Pitcher plant, *Nepenthes khasiana*.

endangered plant. The regeneration capacity of this plant is good in its natural habitats<sup>5</sup> and there are many places where *Nepenthes* is still growing abundantly. However, due to habitat destruction, unsustainable harvesting and other factors<sup>5,6</sup>, pitcher plants may disappear in the near future. The Government of India has already included the plant in the appendix-I of CITES and negative list of exports<sup>7</sup>. Protection of the plant in its natural habitat is one of the important conservation strategies. In Jarain area of Jaintia Hills, a pitcher-plant lake and a small reserve forest have been established for the purpose. The Baghmara Pitcher Plant Sanctuary has been set up in South Garo Hills. Tissue-culture approach has been utilized successfully by some workers for multiplication and conservation of *N. khasiana*<sup>8,9</sup>. However, the best method of conservation would be to protect the plant permanently in its wild by creating public awareness and involving local people in the process of conservation.

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## Need for geological studies to probe land subsidence

Land subsidence is a worldwide problem due to withdrawal of material (gas and fluid) from deeper levels. Because of such withdrawal (water or oil) over a long period of heavy pumping, the pore pressure within the fluid-bearing rocks would diminish considerably. Simultaneously, the fluid level would sink, causing a vertical compression of fluid-bearing rocks. With reduction in pore pressure, the grain-to-grain load would become dominant, leading to compaction and eventually land subsidence.

The quantity of material removed through deep excavation for foundation must be equal to the weight of the planned structure. Similarly, the amount of gas or fluid withdrawn from the subsurface should be replaced with an equal quantity of gas or fluid to maintain the safety factor (natural balance) to reduce land subsidence. Otherwise, land subsidence could occur. This might be the main cause of human-induced activity.

Vertical sinking of a five-storeyed residential complex (Shyamala Sadan), up to its ground floor into the subsurface on 16 September 2011 in Kakinada, Andhra Pradesh, is a serious environmental issue of great concern.

The role of geological studies must not be ignored before commencement of heavy-weight civil structures, because the subsurface geological conditions are not uniform within a short distance in any area. The geological tests would help knowing the nature of the soil – whether it is clay or sand, and rocks – whether they are soft or hard, with their mineral composition and texture, and their association with geological structures like joints, folds, faults, bedding planes, etc. Understanding the bearing capacity of the rocks would be essential to withstand the weight of structures. Generally, the bearing capacity of the rocks considerably reduces by increasing the weak zones in the geological formations.

Following geological tests, seismic survey should be done in the affected and

unaffected areas of land subsidence to get a clear picture of the subsurface geological formations, and also the nature and extent of the hazards and the factors which promote, initiate and accelerate land subsidence, and know whether they are local or regional phenomena. These studies would help solving engineering problems before construction of heavy structures and also formulate effective strategies for mitigating risks to life and property.

The Kakinada incident is the best example of ignoring the role of geological study, while the news about the possible damage to the Taj Mahal due to gradual depletion of water level of the River Yamuna is worrying.

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