Mangroves can check the wrath of tsunami

The tsunami of 26 December 2004 has no parallel in the history for its magnitude and devastation. It struck Indonesia, Thailand, Myanmar, Malaysia, India, Sri Lanka (all in Asia) and Somalia and Tanzania (in Africa) causing colossal loss of human lives, coastal erosions and other destructions. Since tsunami is generated by the collision, subduction, induction and accretion of the continental plates, man remains a mute spectator as he cannot control the process.

The easiest way to avoid the awesome speed of a tsunami is to flee from the coastal areas by means of prior information. But the gap between the generation of a tsunami and the actual strike on the coast may be too short for effective evacuation. It is by no means a permanent solution as the immovable properties and coastal erosions even then would be at the mercy of the killer waves. In this scenario, the plantation, propagation and protection of the mangroves may help to minimize the effect of a tsunami.

'Mangroves' refer to the plants of certain families of angiosperms, e.g. Rhizo-phoraceae, Sonneratiaceae, Verbenaceae and Arecaceae which grow in thick clusters along the estuaries, salt marshes, swamps and coasts in tropical countries. They have characteristic prop roots by which they anchor even on the open coast facing the sea and stabilize the land to harbour many animals. They are very hardy, gregarious and can withstand strong waves as the numerous prop roots prevent them from uprooting. Amongst them the most important genera are *Rhizophora*, *Bruguiera*, *Avicennia*, *Ceriops*, *Sonneratia*, *Lumnitzera*, *Aegiceras* and *Nypa*.

That the mangroves can appreciably diminish the tsunami-related calamities become apparent when we analyse the data from Tamil Nadu. Kanyakumari, Nagapattinam, Pondicherry and Chennai have the dubious distinction for having maximum number of deaths and destruction of properties. All these places have high density of population which led to the virtual disappearance of mangroves from the coast over several decades. But Pichavaram and the adjacent region near Chidambaram in the Cauvery delta have minimum causalities because of the thick mangrove vegetations which made the tsunami less lethal. This place is situated between Nagapattinam and Pondicherry and the tsunami might have struck it with the same lethal speed, yet it escaped mass destruction.

Anthropogenic pressures and activities have almost wiped out the mangrove vegetations from the Tamil Nadu and the Kerala coasts. It is high time that the government machineries and the NGO try to restore the mangroves along these coasts to minimize the number of deaths, destruction of properties, erosion of coasts and even disappearance of tiny islands by any future tsunamis.

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Shannon and Wiener or Shannon and Weaver?

The article by Padalia *et al.*[1] on tree species diversity of Andaman Islands, India, has some typographical errors (or so) in the diversity indices used in the analysis of tree species diversity (p. 801; lines 15–25). Using three different indices of species diversity, viz. Shannon–Wiener index, Simpson's index and Margalef index (when one is sufficient) and also use of both Pielou's index and Whittaker's index as an evenness index are hard to understand. Simpson's index has many forms: one such form has been used by the authors in the article as a measure of concentration. Generally, we use Shannon's index as diversity index and evenness is worked out as the ratio of the value of Shannon's index found to the log S (where S is the total number of species found in the study area; base of the log should match the base that is used in finding out the Shannon–Wiener diversity index). The underlying idea is that species diversity, species richness and species evenness are conceptually very closely related terms (with one another).

As a matter of correctness, 'ni' should be written as 'n_i' ('i' should be written in the subscript as it has certain meaning, i.e. it denotes one particular species at a time, for example, the seventh species or the eighth species). The formula of Shannon's index shows log 2; while within bracket it is written as 'log implies to log base 10'. Log base 10 is written as only 'log' and natural log is indicated as 'ln'. In the reference section (number 12), 'Weiner, W' should be 'Weaver, W'. W. Wiener and W. Weaver are two different persons[2]. The book entitled *The Mathematical Theory of Communication* (see ref. 12) was actually written by Shannon and Weaver. He (Warren Weaver) wrote the second section of the book *Recent Contributions to the Mathematical Theory of Communication* which had not been published in this form in any scientific magazine or journal. Such an error (in the use of correct names of authors in the reference) may be as a result of one common fault in contemporary research where researchers have the habit of giving many references without going back to their original sources.

1. Padalia, H., Chauhan, N., Porwal, M. C. and Roy, P. S., *Curr. Sci.*, 2004, **87**, 799–806.
2. Laishangbam, S., Ph D thesis, Gurukula Kangri University, Hardwar, 2004.

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