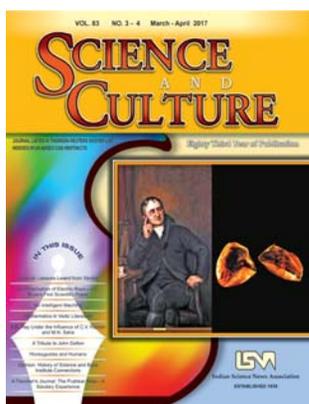


LESSONS LEARNT FROM VARDAH



I was in Chennai in last December when the cyclone *Vardah* hit Chennai and witnessed the ferocity of wind power uprooting trees, felling branches, shattering glass panes in buildings, blowing off the roofs of shanties and loose structures, even overturning trucks carrying goods. And there was the power disruption due to snapping of electric wires and cables, absence of network due to the damage in the transmitting towers which happen in case of storms and rains. According to the reports of the meteorological department wind speed was between 120-140 kmph. Incidentally, the word *Vardah* originated in Pakistan which means 'red rose'. Meteorologists do not differentiate between cyclones, hurricanes and typhoons by their nature or character. Tropical storms are given different names based on their geographical origin; hurricane in the Atlantic, typhoon in the Pacific and cyclone in the Indian Ocean. If a storm's wind speed is equal to or more than 74mph or about 120 kmph, it is then classified as hurricane, typhoon or cyclone depending on their geographical origin.

Naming of this kind of high speed storms originated more than hundred years ago, when Caribbeans named the storms after the saint of the day from Roman Catholic

liturgical calendar for the day on which the hurricane/cyclone occurred. This tradition continued till World War II, when meteorologists started using female names to identify storms. In 1953, the US weather service officially adopted the idea and created a new phonetic alphabet (international) of women's names from A to W, leaving out Q, U, X, Y and Z. Subsequent protests by women's liberation bodies in the 60s and 70s helped change the naming procedure for the storms to include male names in 1978. The year's first tropical storm was given the name beginning with the letter "A", the second with the letter "B" and so on as per the alphabet. In even-numbered years, odd-numbered storms got men's names and in odd-numbered years, odd-numbered storms got women's names.

Naming convention of tropical cyclones which is currently in vogue is a very recent phenomenon. For the

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Indian Ocean region the process started in the year 2000 under the aegis of World Meteorological Organization (WMO) which involves eight countries in this region, namely, Bangladesh, India, Maldives, Myanmar, Oman, Pakistan, Sri Lanka, and Thailand. Eight names were

suggested by each of the countries and these names are circulated sequentially every time a cyclone occurs in this region. Indians proposed the following names: Agni, Akash, Bijli, Jal, Lehar, Megh, Sagar, Vayu. All the Indian names till Megh have already been used up. Next from the Indian names will be Sagar. One may recall that a severe cyclone named 'Megh' hit the Yemeni island of Socotra on November 8, 2015 and received a second blow immediately thereafter

by a cyclone named 'Chapala', the name originated from Bangladesh. The listed names have no retirement, unless someone was so deadly or devastating that the use of its name for a different storm would be inappropriate for reasons of sensitivity.

The intention of writing this editorial is not to write about the naming convention of cyclones but to understand what lessons we learnt from this cyclone. I am not going to discuss direct losses which will anyway be available in government reports but would like to focus on indirect losses which cannot be measured in terms of money. One such losses in this cyclone is the loss of trees. My several visits to Chennai and its neighbourhood in recent times gave me the impression that the tree cover in Chennai is quite impressive. IIT, Madras, Anna University, Theosophical Society, all have very good coverage of greeneries within their campuses. All these campuses as well as roadside trees suffered a huge damage. Transport system had completely broken down for about 48 hours due to road blockage by fallen and uprooted trees. That trees will fall in cyclone is known and expected, but according to experts on plant biology and environmental science "Vardah broke all ground rules regarding our basic understanding on trees" and gave us a chance to ponder about the future corrective measures to prevent loss of trees.

From the survey of trees that were uprooted or fallen, it has been found that Vardah brought down very few native trees compared to the exotic trees migrated from outside. The general conclusion that one arrived at is that exotic species are more vulnerable to high speed winds than the native species. Gulmohrs (*Delonix regia*) and Copper Pods or Yellow Flamboyant (*Peltophorumpterocarpum*) are very common ornamental avenue trees in India and were planted on roadsides for its attractive red or scarlet coloured flowers (in Gulmohr) and yellow coloured flowers (*Copper Pod*). In the statistics of lost trees during Vardah, 75% were Gulmohrs and Copper Pods. Gulmohrs were introduced in the middle of nineteenth century in India by British foresters

presumably attracted by its scarlet coloured flowers when in full bloom. Seeds were brought in Madras (Chennai) from the Botanical Garden of Calcutta. But this tree is native to Madagascar, while Copper Pods are native to South-East Asia and Australia. According to the opinion of experts, "both these trees have shallow roots and are not wind-resistant and either their branches snap or entire tree can be uprooted at a slightest provocation". Another common tree planted in parks, in large compounds and in avenues is the Rain Tree. Its canopies spread over a wide area offer excellent shades is appreciated particularly in the summer. Rain Tree is native to countries in South America. A survey conducted by G. Mullaivanam, an environmentalist, who founded an NGO "Tree Bank" reported that of about 50,000 trees that fell across the city, 24000 were Rain Tree. Tamarind, another exotic tree native to Africa, commonly found in India is known to be a hardy tree, resistant to squalls. But some of the mature trees having girth about 5 to 7 metre fell. This could be because these trees are quite old (about 50 years old). However, one should also remember in this connection that big trees with wide canopies offer more resistance to the wind and are more prone to fell compared to trees which are thin like cocoanut and palm trees.

Indiscriminate planting of trees under the enthusiastic services of tree plantation organized by local clubs or NGOs may turn out to be a disservice to the management of trees. We urge the plant biologists, environmentalists and other experts of West Bengal to come closer to chalk out a concrete scientific plan to plant appropriate species suitable for the local environment, soil, humidity etc. to prevent losses of trees.

According to published report, more than 1000 trees in the IIT Madras campus were ravaged, of which about 250 trees were completely uprooted. Of these 250 trees, about 180 were Kassod (*Cassia siamea*), 20 to 25 were Vanni (*Prosopis cineraria*) and 20 to 25 were Copper Pods. All these trees are non-native invasive species. Compared to this a very few native trees such as Mango, Neem, Anjan, Peeul etc. fell. Interestingly, there are 7000 *Borassus* (Palmyra palm) trees, which is not only a native tree but also a state tree of Tamil Nadu, in the IIT Madras campus and nothing happened to these trees. Another interesting observation is that I did not see any cocoanut tree fell in this cyclone. Although the origin of cocoanut tree is debatable but many believed that its origin is in India-Indonesia region and was distributed world-wide by floating through water bodies.

Therefore the cyclone *Vardah* teaches us that trees that are native to the soil are better suited to bear the brunt of local climatic conditions and can resist nature's fury better than the non-native or exotic species. A recent study estimates that there are 3 trillion trees on Earth, which when translated into trees per capita comes out to be 422 trees per person. But the bad news is that the human civilization has already halved (46%) the number of trees the Earth had at the beginning. Globally, India has an abysmally low number of trees per person (28 trees per person) when compared with many other countries such as Russia (4461 trees per person), United States (716 trees per person), Canada (8953 trees per person), Brazil (1494 trees per person), China (102 trees per person). Trees are one of the most prominent organisms on earth. They store huge amounts of carbon, are essential for the cycling of nutrients, for air quality and many other essential human services. Any loss of trees is fatal for India, yet we remain oblivious on the maintenance of trees.

“Healthy trees are ecological indicators of a sustainable and useful ecosystem”. It is important to plant the trees in a scientific manner. Planting wrong trees in a

wrong place serve no purpose in the long run. According to environmentalists, several factors influence the durability of a tree against heavy winds such as proximity to concrete structure, density of planting, distance from shore, nature of roots and species. Concrete structures obstruct the growth of roots thus causing them to grow unevenly, making them susceptible to high wind speeds. In addition, trees need post-planting care and maintenance just the way buildings need maintenance. According to Dr. D. Narasimhan of Christian Madras College “Cocoanut, Pungan and Palm work better closer to the coast. The larger ones with wider canopy like Peepal or Banyan work better inland”.

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