Declare 2015–2024 the 'Decade of disaster prevention in India'

The recent flood catastrophe in Kashmir, closely on the heels of the devastating flood disasters in Himachal, Bihar, West Bengal and Uttarakhand, conveys much more than that meets the eye. Today, no one would dispute that the frequency and frenzy of disasters are both on the increase and the statistics of death and deluge they cause are neck breaking. What we do not see, however, is our failure to prevent disasters and our unscientific posture in instantly blaming factors such as climate change and heavy rainfall for every disaster without honest introspection and investigation. Barely a few weeks ago, as usual, we had attributed the Malin landslide tragedy of 30 July 2014 in the Pune district of Maharashtra to the heavy rainfall preceding it. Today, we again attribute the Kashmir flood tragedy to the heavy rainfall and blame the people of Srinagar for not moving on to the safe havens at the higher locations, despite the meteorological warnings of heavy rainfall since 2 September 2014. People are not sacks of wheat which can be moved from open fields to the godowns. Is it not foolish to expect resource-starved sick, physically challenged and elderly people, pregnant women and kids to respond to every heavy rainfall forecast and shunt between higher locations and their homes to save their lives because we have nothing better to suggest or do? Surely we need to stop kidding and be honest to ourselves, if we were to take these disasters seriously.

Things are rapidly worsening as we walk on the surface of this ill managed planet and it is high time someone with the loudest voice drives home the point that nearly 80% of our resources are being spent on somehow 'managing' disasters and balance 20% on talking about disaster prevention through planning, meetings, conferences and seminars. We need a paradigm shift in our approach to ensure that we write our own action oriented laws on disaster prevention suited to our own people and their felt needs. The plethora of small and manageable problems we once faced are now big problems and the big ones we had faced have now become intractable. Are we not responsible for the mess? However, it is never too late to make a new beginning. Let us not forget that every disaster is also an opportunity and, as Norman Vincent Peale once said, 'Every problem has in it the seeds of its own solution.'

If we want to solve big problems, we must at least do three things. First and foremost, we must be able to size up the problems, learn from the history and believe in our own ability to crack them. Second, we must realize that we cannot solve big problems with the same level of thinking which created them in the first place. Einstein once said, 'If I had an hour to solve a problem I'd spend 55 min thinking about the problem and 5 min thinking about solutions.' And finally, we must not allow problems to grow from small to big. The day we are able to take care of the street level problems, those at the city level would be on the run and eventually disappear on their own. The question why we are not successful in solving big problems is aptly answered by Henry Ford who said that 'Most people spend more time and energy going around problems than in trying to solve them.'

In the 1990s the New York administration, inspired by the Broken Window theory, realized that the big crimes like murder and robbery can never be controlled as long as the petty criminals, goondas, goons, drunkards and squeegee men get overlooked on a day-to-day basis. It is now a historic fact that the change of tactics by NYC brought about a sudden fall in the crime rate. This has a big message for disaster managers in India. We can never be able to win the war against big disasters without finding timely and apt solutions to local level problems and empowering communities to fight their own battles.

Thus far, we have silently suffered the fatal consequences of expanding problems, shooting hazard levels, and the void of strong political will. We spoke of purifying Ganga without showing the slightest concern over millions of dirty drains which even today find their way into the river, unchecked. The Ganga action plan was launched on 14 January 1986, with the main objective of purifying Ganga. Twenty eight years later the project is back to the drawing board. Every night and decades on end, we dreamt of returning the Himalayas, its beauty and grandeur, while spending our bright sunny days in environmental plundering fuelling climate change and inviting disasters. Some hope has once again returned to the Himalayas with the Cabinet approval of the mission to sustain Himalayan ecosystem on 28 February 2014 but the result will depend on what we do and how we do things differently this time. Another example of our suicidal act is our refusal to stop illegal and non-engineered constructions and mushrooming human settlements even in the areas known to be hazardous. We made roads to improve connectivity, but spared no time to ensure that these very roads, instead of serving the people may not disconnect them in the times of crisis. In removing stones for construction, in our lifetimes, we removed mountains which nature took millions of years to build.

Disaster managers should take the leaf out of the book *The Star Principle* on which Richard Koch wrote 'For every 20 ideas you have, you can confidently junk 19 of them, because they won't be ideas for a star venture. This saves an awful lot of money, sweat, toil and tears.' The story of disaster managers is no different because they refuse to junk stale ideas which are no match to the vexing problems they seek to solve. We need science, technology and innovation to anticipate and prevent disasters before they occur, and counter disasters, if unavoidable. The right road to disaster prevention is one on which violence against nature is prohibited, techno-legal regime is respected, urgent is not allowed to drive out the important, and problems are nipped in the bud.

Disasters are to be managed by the first responders, namely the communities and the local government. The disaster managers arrive and the ambulances appear on the scene much later. Is it not wise therefore to ensure that the communities are equipped, educated and empowered to fight disasters at local levels? By taking care of the small resource requirements at the local levels, not only the total disaster management costs at the national level will reduce but the returns on our overall investment in disaster management will rise. In the recent Srinagar flood disaster, areas like Indira Nagar, Shiv Pura, Mahzoor Nagar and

Jawahar Nagar got submerged under several metres of water. The real blame should go to unchecked urbanization and absence of surface and subsurface drainage rather than only to heavy rainfall. Imagine the benefits, if the local government would have spent a tiny fraction of the relief packages and the management cost in cleaning up the clogged drains, improving drainage and empowering communities to protect themselves. Only a few days ago, I saw the whole of the road network of Kaushambi in Ghaziabad under a thick carpet of running sewerage. This was waiting to happen because of the non-functional sewers, clogged drains, and the ugly spread of solid waste and construction debris all over. Despite this, 10 out of 10 people I spoke to, failed to see their own blunders and placed the blame squarely on the heavy rain that lashed the area just for a few hours. And the life in Kaushambi once again became normal as the flood waters receded!

As I begin to conclude this piece, I am reminded of the famous 80/20 principle – the secret of achieving more with less. Richard Koch, a British investor, wrote a whole book on it, attributing the principle to the Italian economist Vilfredo Pareto. Pareto had proposed a mathematical formula to conclude that 20% of the people in his country owned 80% of the wealth. Inspired by Pareto, Joseph M. Juran gave the slogan 'vital few and trivial many'.

Disaster managers in most developing countries seem to mistake small as trivial. Further, they chase 'trivial many' at the expense of the 'vital few'. We will be able to find lasting solutions, if we learn to fight small problems on a day-to-day basis and all big problems on a war footing until the war is won. In the process, we must reject cosmetic, populist and outmoded technologies and grow the culture of safety, innovation and speed effectiveness in our actions.

In John Steinbeck's last novel *The Winter of Discontent*, he writes 'I shall revenge myself in the cruellest way you can imagine. I shall forget it.' We have suffered disasters far too long and the time has come when the blood in our hands will not allow us to forget disasters any more. Let us all pay homage to the victims of the great flood tragedy in Kashmir by declaring 2015–2024 as the decade of Disaster Prevention in India. By the end of the decade, we must aim to achieve the shift of national focus on prevention, preparedness, capacity building and timely corrective action. If we show zero tolerance against mindless urbanization and ensure fully functional network of drainage, at least 80% of our flood problems will vanish at 20% of the money spent on relief, rescue and reconstruction.

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Biochar as carbon negative in carbon credit under changing climate

Biochar, also called soil conditioner or zero waste, is a carbon-rich charcoal-like substance formed by heating the biomass in limited oxygen condition by a process called 'pyrolysis'. Greenhouse gas emission is reduced by the conversion of biomass to biochar as this process locks up the carbon from the biomass into the biochar and thereby delaying the release of this carbon back to the atmosphere. If biochar produced is buried into the soil for carbon credits and crop enhancement, pyrolysis process can be carbon negative. Annual net emissions of carbon dioxide, methane and nitrous oxide could be reduced by a maximum of 1.8 Pg CO_2–C equivalent (CO_2–Ce) per year (12% of current anthropogenic CO_2–Ce emissions), and total net emissions over the course of a century by 130 Pg CO_2–Ce, by utilizing the maximum sustainable technical potential of biochar to mitigate climate change, without endangering food security, habitat or soil conservation[1]. If a pyrolysis facility is financially viable, then the potential revenue from C emissions trading alone can justify, optimizing the plant to produce biochar for application to the land[2].

When the use of the process of biochar sequesters more carbon than it emitted, it is carbon negative. Biochar holds 50% of the carbon biomass and it sequesters that carbon for centuries when applied into the soil, removing the CO_2 from the active cycle and thus reduce overall amount of atmospheric CO_2. Plant growth is also enhanced by this process as it absorbs more CO_2 from atmosphere. Overall, these benefits make the biochar process carbon negative as long as biomass production is managed sustainably. Biochar system also needs to be taken into account, viz. emissions resulting from biomass growth, collection, pyrolysis, spreading and transport, to consider it a truly carbon negative. Due to its capability to actively reduce the atmospheric concentrations of greenhouse gases, biochar technology may be considered as geoengineering solution. It may also be considered as a long wave geoengineering option for climate change mitigation as it plays a role into the removal of CO_2 from the atmosphere and enhances the level of long wave radiation leaving from the planet. A biochar system is a carbon sink, where agricultural crops are grown and is subsequently pyrolysed to produce biochar, which is then applied to soil[3]. This means that CO_2 from atmosphere is sequestered as carbohydrates in the growing plants and that conversion of the plant biomass to biochar stabilizes the carbon. The stabilization of carbon in biochar delays its decomposition and ensures that carbon remains locked away from the atmosphere for hundreds to thousands of years. In addition, biofuels can also be made by utilizing the gases released during biochar production. In carbon cycle, plants remove CO_2 from atmosphere via photosynthesis and convert it into biomass. But all of that carbon (99%) is returned to atmosphere as CO_2 when plants die and decay, or immediately if biomass is burned as a renewable substitute for fossil fuels. In biochar cycle, half (50%) of that carbon is removed and sequestered as biochar and the rest half (50%) is converted to renewable energy co-products before being returned to the atmosphere. The carbon cycle which makes biochar carbon negative is shown in Figure 1.

A carbon offset credit is a payment made by an emitter of carbon (a power