Editorial

Expectations, struggles, satisfaction and realities as an Editor.

I have been associated with the "Journal of Indian Geophysical Union" (JIGU) since its inception in 1997. In spite of long association with JIGU I have requested President of IGU to entrust the responsibility of managing the journal to a new editor. Many may wonder for this decision of mine, to step down before completion of the present term of the editorial board; 31st March, 2018. The basic reason for taking such a decision is due to my discomfort in managing the journal because of various impediments, especially lack of energy (due to age related health problems) to take quality decisions from covering almost all the aspects of publishing, starting from day to day correspondences to close monitoring of various important aspects for bringing out bi-monthly issues on time. Since I made it a point to manage the journal with quality as the fulcrum, I will continue to extend my services till my health permits. I achieved something noteworthy but not substantial. I only feel bad for not getting SCOPUS accreditation, even though we have introduced number of measures to meet the norms of Thomson Reuters (TR). These measures have enhanced quality of the journal significantly. Thomson Reuters have been satisfied with the recent measures taken by us and made our journal a full fledged Emerging Sources Citation Index (ESCI) journal. By end of 2017 TR is supposed to reevaluate quality of JIGU to sanction SCOPUS accreditation. It is to be pursued. As of now the journal is recognized as an emerging source cited journal by Thomson Reuters and a full fledged cited journal by Indian Citation Index (ICI). The National Institute of Science Communication and Information Resources (NISCAIR) too recognized it as a quality journal. These positive developments took place during the last 3 to 4 years, giving me an amount of satisfaction at my advanced age.

To realistically achieve favourable results in getting international recognition our journal should meet various stringent norms that probably include both short term and long term citations. According to American Geophysical Union (AGU) the Journal`s Impact Factor (JIF) tends to get the most attention by the scientists, but it is just one metric that focuses on short-term citation. Other metrics — such as the 5-Year Journal Impact Factor, Immediacy Index, Cited Half-life, as well as the h-index, Eigenfactor, and usage — can be used to gain a more complete view of a journal's influence on a scientific field, although these are still influenced by a journal's size and scope. In addition to absence of an organised administrative structure the lack of exposure to these metrics in quantifying JIF by Chief Editor and the small group of editorial board, acted as barriers to introduce any of these apt technical measures. It is essential for us to introduce some of these quality enhancement measures by procuring well known commercial software that can routinely weed out unethical publication practices while editing a manuscript. This will effectively draw the attention of internationally reputed accreditation channels.

Irrespective of our limitations, we could enhance quality of the journal to a reasonable level by assiduously following the norms fixed by Thomson Reuters. One of the norms is critical evaluation of all the manuscripts and ensuring strict adherence to publication ethics that ensures elimination of plagiarism to a significant extent. As a part of these quality enhancement norms we have ensured adoption of peer reviewing. Unfortunately, due to one reason or the other while the work component increased multifold the facilities accessible to achieve these norms remained static. To ensure enhancement of the quality of the publication, a small team of dedicated members of editorial board and learned well wishers of JIGU have put in extra work to complete review process on time. The responsibility of day to day JIGU administration remained with me. I thank all those who have lent support to me in achieving reasonably good results.

While writing this editorial I came across an excellent article in EOS, on peer reviewing. Since it is useful to make our journal a highly cited journal some points given in that write up are reproduced below. I believe that they will be useful for one and all associated with any journal`s management.

In Appreciation of AGU's Outstanding Reviewers of 2016

Peer-reviewed literature plays a critical role in advancing science. However, peer reviewing has been generally undervalued in terms of its contributions and of the collective level of effort involved. Despite the challenges of relying on volunteers, peer review is essential for helping maintain the integrity of science and its efficient advancement (by forcing some quality checks on the official archive of progress). It also plays a vital role in the granting of awards and has value for society in that the peer-reviewed literature increasingly has official, codified uses in law, regulations, and advisory input.

Much of the scientific community's outreach to the public is through the press and, thanks to quality publications, through our community's leading journals. Checks to enhance reproducibility and to drive improvements in the science help overall quality. In turn, quality peer review in many ways distinguishes leading journals from the growing threat of so-called predatory journals that can degrade scientific integrity.

The task of peer reviewing forces researchers to think deeply and broadly about others' contributions to science in ways that are fundamentally different from simply reading a paper. The process of reviewing helps scientists improve their careers and develop better networks. In the case of peer review, the collective whole is much more than the sum of its very important parts.

Although individual recognition of highly motivated reviewers is important and needs to expand, we have to provide a collective thank-you to peer review participants in the larger process and integrated effort that is helping expand integrity across the scientific enterprise. As pointed out by Brooks Hanson, Director, Publications, AGU; and Lisa Tauxe, Chair, AGU Publications Committee Peer review can be improved in many ways, and experiments are to be carried out across leading publishers (JIGU is striving to become one of them. It can achieve success, provided it is supported by the sponsors in all respects to achieve this target). Since manuscripts received by JIGU include 50% of articles from students and young researchers the effort put in by motivated few reviewers to enhance the quality is significantly noteworthy. I salute them.

(**Source**: Main content has been used from the Eos Buzz Newsletter: 2 June, 2017. The link: https://eos.org/agu-news/in-appreciation-of-agus-outstanding-reviewers-of-2016?utm_source=eos&utm_medium=email&utm_campaign=EosBuzz060217).

Earthquake prediction- Limitations of the seismologists

A six member team of Italian seismologists who could not predict an earthquake of magnitude ~6.3 on 6 April 2009, that struck L'Aquila a medieval settlement built on an ancient lake nestled in the Apennines were found guilty of "Man Slaughter" and imprisoned as their assurance that no earthquake would occur in that region proved wrong, leading to failure of pre disaster management and post disaster mitigation operations. More than 300 people died, and 20,000 buildings were destroyed. The imprisonment of seismologists received mixed reaction. The global seismology community in general were shocked by the treatment meted out to the Italian seismologists. Others who have no knowledge of limitations of earthquake prediction and residents of the ill fated medieval settlement supported the decision taken by the Italian court and criticised the seismologists. The accusation made by the court was not based on the conclusion that experts failed to predict the earthquake, but that they failed to properly assess and communicate the risks, telling residents they were safe without any scientific basis for doing so. The infamous "No Danger" statement by the government official associated with the expert team led to an incredible six years in prison for the six experts and one government official, as per the judgement in October, 2012. Fortunately, the Six seismologists accused of misleading the public about the risk of an earthquake in Italy were cleared of manslaughter on 10 November, 2014. An appeals court overturned their six-year prison sentences and reduced to two years the sentence for a government official who had been convicted with them. The appellate judges concluded that the scientists were innocent because there was no reason to think the swarm had increased the risk of a major earthquake. They maintained that the triggering of larger earthquakes by smaller ones is an idea that scientists have only taken seriously since the L'Aquila earthquake. This entire episode brought in to light the significant stress attached to short term earthquake prediction, in time and space and the difficulty faced by the seismologists in explicitly explaining the reasons for subjective assessment of a threat from high magnitude earthquakes.

Since hearing the plight of Italian seismologists I have been wondering about the type of strategies to be adapted by seismologists to overcome many limitations of short term prediction. While in my usual way pondering about ways and means of predicting earthquakes and the present status of our knowledge, I have come across an important write up "Faulty Assumptions Impair Earthquake Hazard Assessment in Italy" in EOS and made me to recollect the unfortunate consequences of wrong prediction made by the Italian seismologists and severe differences of opinion surfaced in India about 9 magnitude earthquake in Himalayas. Even though the write up in EOS is not directly connected with the previous unfortunate incident, however, brings into focus the type of ambiguity that can mislead seismologists in earthquake hazard assessment, as the study covered Central Apennines, known for its strong tremors, including the 2009 L'Aquila. It is interesting to note the following from the write up that appeared in 16th May 2017 EOS.

When an earthquake strikes, vertical movement along a fault can create or add to a distinctive step-like feature known as a fault scarp. Bedrock exposure at the surface of a scarp can serve as a proxy for fault slip rates and for estimating the recurrence interval of future large earthquakes. However, new research by *Kastelic et al.* shows that non-earthquake-

related factors also expose rock along faults in Italy's Central Apennine Mountains. Since 1975, scientists have studied fault scarps in a region of the Central Apennines known for its strong tremors, including the 2009 L'Aquila and 2016 Amatrice-Norcia quakes. Although some scientists have cautioned that non-tectonic movement may contribute to fault scarp exposure here, several studies have attributed all rock exposures solely to seismic movement.

To investigate the potential role of non-tectonic factors in the region, the team monitored 23 fault scarp sites along 12 different faults. At each site, the researchers marked the lower edge of the exposed rock surface with a short streak of waterproof paint, and they returned every few months to add a new mark. After 3 to 4 years, the paint marks indicated that the exposed rock surface had grown by several cm at 22 of the sites. When the scientists compared their results to earthquake data, they found that none of the exposures could be attributed to earthquake-driven fault movement. Instead, precipitation data suggested that weathering processes and landslide movements were responsible.

Non-tectonic processes contribute to the heightening of some fault scarps through vertical exposure of bedrock walls. Since the height of fault exposures is often used to constrain the earthquake potential, these processes may impair the assessment of the local seismic hazard. The researchers conclude that many existing slip rates for Central Apennine faults are based on invalid assumptions, leading to incorrect estimates of the number of expected large earthquakes and hence of the local seismic hazard. They call for better methods of fault slip measurement to account for any non-tectonic processes that may be in play.

(**Source:** Journal of Geophysical Research: Earth Surface, https://doi.org/10.1002/2016JF003953, 2017).

The above study clearly exposes the complicated nature of slip rates associated with faults and the limitations of our understanding of non-tectonic processes and earthquake dynamics in seismically active regions. In a way it stresses the necessity to be more cautious in arriving at any conclusion regarding hazard assessment of any region, especially the vulnerable locations in seismically active belts. Even in a small area in seismically sensitive regions one may encounter different types of surface manifestations, in addition to unknown subsurface disturbances and settlements. As such before coming out with any statement for or against high magnitude seismic activity one needs to acquire error free data and precisely build different types of structural models that support reasonably well probable occurrence of a significant seismic activity in time and space. In spite of focused studies this is extremely difficult as evidenced in different parts of the earth. Ignoring this gospel truth will create problems to one and all. In Himalayas and seismically active regions all over the globe, as of now, none has predicted accurately in time and space a high magnitude earthquake. And as such it is essential for the global seismological community to continue to carry out varied types of research to gather useful information pertaining to earthquake mechanism and subtle variations in pre disaster signals to come closer to short time prediction. As a first step it is essential to establish a good number of different types of surveillance networks to narrow down gaps in our understanding of fault dynamics. Even though the study in Apennines is simple in nature it is exemplary and worth replicating in other places, in co-ordination with standard surveillance studies.

In this issue

In this issue there are 10 research articles, an "editorial" and "News at a glance". As mentioned in the previous editorial (published in the July issue) Thomson Reuters are in principle satisfied with the quality of the journal and our sincere effort to adhere to publication ethics. However, to make JIGU a recognised SCI journal it is essential for the JIGU editorial board to introduce different modes of evaluation to better quantify the quality of a manuscript. While thanking one and all for lending needed support to me during all these years I solicit, on behalf of the editorial board, your continued support to JIGU.

P.R.Reddy

* That best portion of a good man's life: his little, nameless, unremembered acts of kindness and love.

-William Wordsworth- (1770-1850) famous English Romantic poet

The Asian Summer Monsoon Launches Pollutants around the Globe

Pollution knows no borders. When pollutants are lofted into the atmosphere, strong winds in the region of the upper troposphere and lower stratosphere can carry the noxious chemicals around the globe before they have a chance to decay into more benign forms.

Researchers know that during the boreal summer, the Asian summer monsoon (ASM) plays an outsized role in lifting pollutants up into this boundary region between the troposphere and the stratosphere. Given that recent trends of explosive growth in both population and emissions in Asia are expected to continue, understanding exactly how the ASM affects the distribution of pollutants in the atmosphere will become ever more important.

A team of researchers used measurements from an instrument aboard NASA's Aura satellite, which was launched in 2004, to examine trace gases and cloud ice water content in the boundary region between the upper troposphere and the lower stratosphere throughout the life cycle of the ASM anticyclone, a region of high pressure around which winds circulate. The team used data collected by the Microwave Limb Sounder aboard the satellite to quantify water vapor, carbon monoxide, chloromethane, acetonitrile, and methanol as tracers of tropospheric air, as well as ozone, nitric acid, and hydrochloric acid as tracers of stratospheric air, as the ASM anticyclone developed and dissipated.

By combining MLS data with meteorological analyses from NASA's Goddard Earth Observing System, Version 5.9.1, the team provided a comprehensive overview of the ASM's impact on the entire evolution of the convective system from April to October. Each year, as the anticyclone spins up in April, the MLS observes undisturbed background levels of the trace gases, but as the anticyclone strengthens, the gradient of tracers between the edge of the weather system and the surrounding air grows steeper. The team found that abundances of many of the pollutants, including carbon monoxide, chloromethane, acetonitrile, and methanol, peak in June and July, after the monsoon reaches maturity, attaining heights as high as 20 kilometers.

The study provides a benchmark for the effect of the ASM on atmospheric composition, but future work will need to resolve the effects of interannual and intraseasonal variability in both the anticyclone and the characteristics of the boundary between the troposphere and the stratosphere. (**Source:** Journal of Geophysical Research: Atmospheres, https://doi.org/10.1002/2016JD026408, 2017).