

any journal depends upon the attitudes of the authors, reviewers and editors. The quality of the journal depends upon the quality of the manuscript submitted to it. It is believed that authors submit their inferior papers to Indian journals, but this is not always true. Amateur researchers are not sure about the publication of their science in a journal of their choice, whether Indian or foreign. In particular, established scientists can make a choice and they should try to strengthen the Indian journals by publishing their work in them. The publication of a paper largely depends upon the reviewing of the manuscript by the peers. Thus, reviewers are vital and the most important link between the authors and editors. Also, editors of Indian journals are required to encourage those publications which report innovative and exciting

researches and those which offer unconventional interpretations. *Current Science* is one such journal and it will, I believe, maintain its tradition of reporting the best of science from India.

We must devise a mechanism for assessing the quality of publications for selection for university and college teachers and similar purposes. The best way is to read the papers published by a scientist for evaluating his research work. Reading every paper may not be practically feasible for assessing quality. Alternatively, in my opinion, journals should be classified into three different categories for this purpose. For example, papers published in reputed journals like *Cell*, *Nature*, *Science*, *PNAS*, etc. should be classified as category-I. Papers published in other *Science Citation Index (SCI)* journals should be classified as

category II, and those published in non-*SCI* journals as category III. A rational credit should be given for each category. The same can apply to journals published in social sciences and arts. This will reduce the bias related to national versus international and to the IF of individual journals.

1. Lakhota, S. C., *Curr. Sci.*, 2013, **105**, 287–288.
2. Balaram, P., *Curr. Sci.*, 2013, **104**, 1267–1268.

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Women biologists in India: challenges

Literacy, being the most potent tool for erasing poverty and inequality, is simply defined as the ability to read and write. It measures the economical and technological status of a country in today's scientific world. According to the Central Intelligence Agency (CIA) world fact book, a principal intelligence-gathering agency of the United States federal government, about 79.7% women around the world in the age group 15 years and above are literate whereas in India, literate women constitute 65.5% of the population in the age group 7 years and above¹⁻³. Time also has witnessed many women leaders in science and their contributions to research. Today, women constitute approximately 50% of the population across the globe. Table 1 gives the percentage of women calculated from the total enrolment at different stages and levels of education in India, according to a survey on education in 2009–10 by the Ministry of Human Resource Development, Government of India⁴.

With an almost equal ratio of population and fairly a decent rate of literacy, we ask why only a countable number of women continue their career in science, especially biology. Is it the physiology of a woman which makes her less ambitious or is it simply lack of interest? Has capability and choice of subjects anything to do at the DNA level? Or is it simply fam-

ily responsibility, gender bias, social discrimination or economic exploitation, which hinder the growth of a woman? Governments around the world, including India have strategized policies for the development of women in all sectors; be it education, employment or scientific growth. Also, there are many national and international science fora; we contemplate what percentage of women has been benefited from it? What is holding them back to live their dreams or be a successful entrepreneur? Is there something more to be done to save this prospective human talent? The scientific community does not wait for anyone and expects continuous growth and productivity. Thus it becomes a rough road for a woman to balance her family and work. Open-mindedness and sensitivity need to be applied while employing women scientists.

In 2009, we realized the need for a special forum to understand and motivate women members in our organization. We generated the Women in Biology (WiB) Journal Club (JoC) of Bioclues. Today with our continuous efforts in the form of monthly meetings, virtual discussions and voluntary projects our women are able to express themselves and contribute to the development of biology and bioinformatics. We have been privileged to have worked on six projects of which

two are published, three are under communication and one project is in the making⁵. Apart from this, our women have to their credit five posters and presentations at national and international levels, participate in competitions and events actively and a couple of them are also a part of the mentoring team which trained the Government of India, initiative – Biotechnology Consortium of India Limited (BCIL) trainees. We now look forward to take our forum onto a bigger platform to guide and assist women researchers in need, all around the world.

One thing we all have to understand is that our economy and growth also depend on the development of women. So conscious and sincere efforts need to be made to see that already set strategies

Table 1. Enrolment of women at different stages

Course enrolment	Women (%)
School education (Nursery–XII)	46.83
Higher education (general courses like arts, science and commerce)	54.62
Higher education (professional courses like engineering, medicine, law, etc.)	37.05
Ph D/M Phil	40.60

and programmes are implemented appropriately, especially in fields like bioinformatics where women can do research by using computers at home. For where women can express themselves without any hindrance should be motivated. We all have to understand that it is not the lack of interest or ambition that causes a woman to withdraw right when she is at the prime of her scientific career. If that were the case we will not see women pursuing science by choice at college and university levels. It is high time that we all join together to work towards the development of woman and in turn towards the welfare of mankind. We would like to share an interview given by Michelle Bachelet on role of women in develop-

ment⁶. We conclude by citing a quote from Erica Jong, 'Everyone has talent. What is rare is the courage to follow the talent to the dark place where it leads'. Women have that extraordinary courage; so dare to dream and live that dream.

1. http://en.wikipedia.org/wiki/List_of_countries_by_literacy_rate
2. <https://www.cia.gov/library/publications/the-world-factbook/fields/2103.html#136>
3. <http://censusindia.gov.in/2011census/censusinfodashboard/index.html>
4. Reference: Statistical Year Book, India, 2013; http://mospi.nic.in/mospi_new/upload/SYB2013/ch29.html
5. http://bioclues.org/joomla/index.php?option=com_content&view=article&id=51&Itemid=38

6. <http://www.youtube.com/watch?v=52BIE-B7mAmc&feature=youtube>

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Legal aspects of earthquake forecasting

Dimri¹ has raised two significant questions. The first is about the directivity of tsunamis and the other about legal aspects of forecasting earthquakes and tsunamis. As far as directivity of tsunami waves is concerned, the matter is quite simple for seismologists. In general, it may be remembered that the occurrence of tsunamis is a result of a large-magnitude earthquake. The large geological or tectonic faults in the Sumatran and Andaman regions are quite well known. These faults have generated a number of moderate to large magnitude earthquakes during the last 100 years or so. If we know the fault plane solutions of these past historical seismic events, then the potential direction of tsunami waves could be easily determined. As a thumb rule it may be remembered that amplitude and energy of tsunami waves are minimum in the direction of rupture, whereas they are highest at right angles to the direction of rupture. This is explained with the example from the 26 December 2004 earthquake and related tsunami.

On 26 December 2004, the rupture started at 00 h 58 min 47 sec UTC and continued for at least 7 min, as reported by Park *et al.*². The rupture extended towards northwest along the Sunda trench for 1200 km to the Andaman Islands. The energy associated in two directions can be seen in Figure 1. The city of Galle in Sri Lanka was severely damaged by the tsunami, while Cocos Island, which is roughly on the same great circle distance (1754 km) from the epicentre, recorded

only a maximum tsunami amplitude of 42 cm. This also explains the reason why Kolkata, Sundarbans and Bangladesh did not suffer from any tsunami attack. Nagapattinam area on the east coast of India was almost at right angles to the NW end of the rupture. Similarly, the Thailand coast was at right angles to the direction of rupture. Both the locations have suffered heavy damages. The Indian National Centre for Ocean Information Services (INCOIS), Hyderabad has records of several moderate to large magnitude earthquakes with fault plane solutions for $M > 7.0$ in Indonesia, Andaman and neighbouring region. Once the epicentral location of an earthquake is known, it would be easy to find the likely direction of propagation or directivity if the fault plane solutions of historical seismic events and the latest earthquake are known. It will take about 120–140 min for the tsunami waves from Indonesian region to reach east coast of India. This time is sufficient to organize suitable mitigation and administrative measures.

The second point discussed by Dimri¹ is about the verdict of an Italian court with respect to the L'Aquila earthquake. The L'Aquila region was experiencing small magnitude earthquakes before the event. Local population was apprehensive and was expecting an earthquake to strike. The Italian Government sent a committee to assess the seismic situation. The committee examined the site and then announced that there is no possibility of earthquake occurrence. Within

one week of this announcement an earthquake occurred and killed about 300 people. Local people filed a criminal case of manslaughter on the scientists and the court convicted them to six years imprisonment³. The Italian case is presently being lodged in higher court. As discussed by Balaram⁴, the interaction between science and law would increase in future. The medical profession has been experiencing legal battles and tangles for long. Failure of any engineering system or machine had also attracted legal provisions and some legal cases against engineers.

An example from 2006 about Dibrugarh earthquake prediction would illustrate

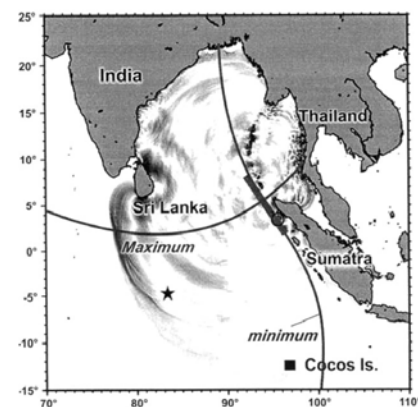


Figure 1. Total rupture (thick line) during 26 December 2004 earthquake. The location of Nagapattinam is almost at right angles to the northwestern end of the rupture.