

CSIR in Media



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A Daily News Bulletin

12th December 2017



IMD installs Automatic Weather Observation System on 10 metre mast at Mangalore airport

CSIR-NAL

12th December 2017

The Met department is currently involved in calibrating temperature and pressure sensors, transmissometers (for visibility) and plans to procure instruments required for up to 70 airports, given the newer airports being planned.



IN A first, the Surface Instruments (SI) division of the India Meteorological Department (IMD), Pune, has installed an ingeniously developed Automatic Weather Observation System (AWOS) at Mangalore airport on a 10-metre tall mast. This is a part of upgrading and facilitating real-time weather updates directly to the pilots. Presently, all information pertaining to visibility, temperature, wind speed and direction, humidity prevailing at the location and the runway area of the airport is first sent to Air Traffic Control (ATC), from where it is relayed to pilots. Until now, only a handful of AWOS were installed at select

airports in the country, including at Juhu airport, Mumbai, where instruments were mounted on masts measuring 6m in height. It was sometime last year that World Meteorological Organisation (WMO) revised guidelines internationally for installing AWOS on masts ranging from 6 metre to 10 metre, after which a joint venture with CSIR-National Aerospace Laboratories (NAL) was planned. This is being carried out on a trial basis at Mangalore airport, which is located on hilly terrain, also known as a table-top airport. The trials have been on for over three months now and will continue for a year,” informed a senior official from the division involved in the project. The challenge, however, remains in designing a mast that is frangible, so that it not only remains light in weight, just enough to support the on board AWOS instruments along with

simultaneously being able to withstand wind speeds ranging from 50 to 60 m/sec, the official explained. “With the scaling up of the height, work is presently on to design the mast in such a manner that it can be either lowered or bend, for installation, maintenance or calibration purposes of sensors and other instruments, all of which is being led by experts at CSIR-NAL,” the official added.

Besides, the SI division is also working on procuring and installing instruments for the newer proposed airports in India. Under the UDAN project, launched in October 2016, the instrumentation team will be additionally responsible for calibration, installation and maintenance of these instruments, presently being purchased for 52 airports, including Shirdi, Aurangabad and Kolhapur airports in Maharashtra.

“These are airports having limited operations, that is, most of them only during the day time, thereby having specific requirements. In addition, the requirements can also vary according to the geographical locations and local weather conditions,” the authority informed.

The Met department is currently involved in calibrating temperature and pressure sensors, transmissometers (for visibility) and plans to procure instruments required for up to 70 airports, given the newer airports being planned.

Published in:
[The Indian Express](#)

Lalji Singh (1947-2017): The pioneer of DNA evidence

CSIR-CCMB

12th December 2017

Lalji Singh made a seminal contribution to the disciplines of genetics, forensics, conservation and law.



Born at the cusp of the country's independence in a family of modest means in Kalwari village in Uttar Pradesh's Jaunpur district, Lalji Singh became synonymous with the term, "DNA fingerprinting", to a generation of Indians. Lalji (as he was called) and the CCMB (Centre for Cellular and Molecular Biology) became household names when DNA fingerprinting was used to identify victims and nail the accused in the assassination case of the late prime minister, Rajiv Gandhi, as well as the gruesome Naina Sahni murder case in the 1990s. Today DNA evidence is admissible in courts and is used routinely in cases such as

the Dadri lynching case or the paternity suit involving N D Tiwari. Lalji earned a PhD from the Banaras Hindu University in 1971, studying the chromosomal differences between male and female snakes. He went on to identify a region of DNA that has repetitive sequences of GATA, the alphabets that make up DNA. This region, coined the Banded Krait minor (Bkm), was found to be present in almost all species Lalji could test. The region had the ability to differentiate between species and even individuals of the same species. This meant that by using the Bkm region in the DNA one could distinguish between individuals and find similarities between parents and their children. For Lalji, DNA fingerprinting was not just a technique but a lifelong passion. When the use of DNA fingerprinting was not yet an established method in legal cases, faced stiff resistance. He campaigned incessantly for the use of

modern scientific methods, appeared regularly in courts and testified not just on the case in question but also for the need and importance of using DNA fingerprinting. His efforts paid off. Recognising the growing need for expertise in genetic diagnostics and identification, in 1995, the Department of Biotechnology established the Centre for DNA Fingerprinting and Diagnostics (CDFD) in Hyderabad under the leadership of Lalji. He became the director of CCMB in 1998 when the world was entering the era of genomics (the study of the complete DNA content of a cell). He introduced state-of-the-art technologies and instruments in the institute. Lalji brought with him his unique style of leadership. He put in more than 100 per cent effort in all his endeavours and expected the same of everyone. He ran the institute like a tight ship and pushed its scientists to strive for their best. Lalji continued his interest in using DNA fingerprinting to find differences and similarities between species using the Bkm DNA. He spearheaded an effort to bring modern genetic tools to improve conservation of endangered species and prevent illegal trading in wildlife products. This led to the establishment of the only dedicated Laboratory for Conservation of Endangered Species (LaCONES) in the country. The Hyderabad-based laboratory is doing path-breaking work in the field of wildlife forensics and conservation of important wildlife species. Lalji's tireless efforts in the field of genetics and genomics was recognised by the Government of India, when he was awarded the Padma Shri in 2004. During his final years at the CCMB, Lalji initiated genomic studies to understand the complex origins of population groups in India. These studies revealed the genetic footprints of early human migration from Africa to Asia and onwards. Lalji's journey came full circle as he moved back to Banaras Hindu University as the vice-chancellor in 2009. During his stint at BHU, Lalji started a Masters course in forensic science. After his tenure ended, Lalji headed back to Hyderabad to continue his efforts at bringing science to the public through his Genome Foundation. But as if to say goodbye to the city that taught him his trade, Lalji went back to Varanasi. He was in the city in his final hour. In his passing away, we have lost an eminent scientist, an able administrator and an institution builder, who encouraged and inspired all around him to excel.

We had the privilege of being associated with him and can say his legacy in areas of biology, forensics, law and conservation will live on. Lalji left DNA fingerprints wherever he went.

Published in:
[The Indian Express](#)

Published in:
The Hindu, Dainik Bhaskar, Business Line

लघु वन उपज की गुणवत्ता बढ़ाने का मिला प्रशिक्षण

जागरण संवाददाता, राउरकेला : लघु वन उत्पादों की गुणवत्ता बढ़ाने के लिए ट्राइफेड नई दिल्ली के सहयोग से खनिज एवं पदार्थ प्रौद्योगिकी संस्थान भुवनेश्वर द्वारा विकसित सौर सह वायोमास ड्रायर की स्थापना कुतरा ब्लाक में की गई।

इस मौके पर स्थानीय लोगों को इसकी उपयोगिता के लिए प्रशिक्षण भी दिया गया। ट्राइफेड नई दिल्ली की पूर्व अध्यक्ष सुकेशी ओराम इसमें मुख्य अतिथि थी। उन्होंने आदिवासियों के सामुदायिक विकास के लिए किये गये इस खोज की प्रशंसा की। उन्होंने कहा कि फसल की उपज के बाद होने वाली हानि को कम करने तथा बिचौलियों के शोषण से बचाने में मददगार होगा। इसके जरिये लघु वन उत्पादों को अधिक समय तक सुरक्षित रखा जा सकता है। ट्राइफेड के क्षेत्रीय प्रबंधक एनसी दलई ने आदिवासियों के लिए लघु वन उपज का महत्व व इससे बड़े पैमाने पर रोजगार के

मिला लाभ

- कुतरा ब्लाक में लगा ट्राइफेड का शिविर, सौर सह
- वायोमास ड्रायर की स्थापना समेत अन्य जानकारियां मिली

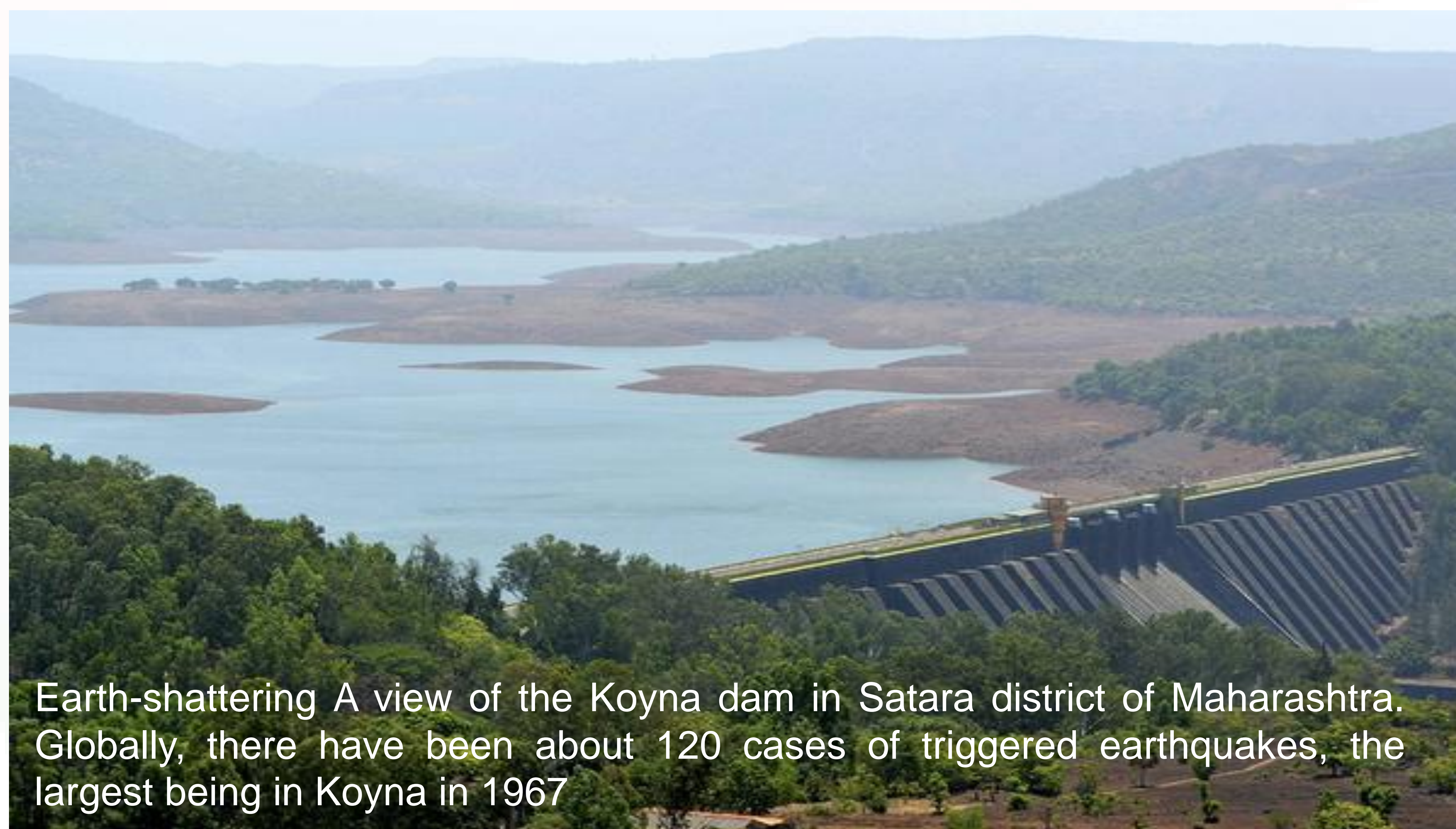
अवसर पैदा करने पर अपने विचार रखे। सौर सह- वायोमास ड्रायर के उपयोग से आदिवासियों की सामाजिक एवं आर्थिक स्थिति में सुधार आयेगी। ट्राइफेड के पूर्व अध्यक्ष उपेन्द्र प्रधान ने आइएमएमटी भुवनेश्वर द्वारा विकसित हाइब्रीड ड्रायर का उपयोग लघु वन उत्पादों को सुखाने एवं उसकी कीमत बढ़ाने में मददगार होने की बात कही। मुख्य वैज्ञानिक डा. पीके सेनापति ने ड्रायर की तकनीकी एवं संचालन की विधि बतायी और कहा कि इसे सामान्य व्यक्ति भी आसानी से चला सकता है।

Published in:

[Dainik Jagran](http://www.dainikjagran.com)

50 Years after Koyna, lessons form the mega earthquake

CSIR-NGRI



Earth-shattering A view of the Koyna dam in Satara district of Maharashtra. Globally, there have been about 120 cases of triggered earthquakes, the largest being in Koyna in 1967

On December 10, 1967, Koyna in Maharashtra hit the headlines globally. And it left seismologists shaken. A devastating 6.3 magnitude earthquake in Koyna, where a grand, huge dam was built in 1962, caused much misery. But, more importantly, it shattered a long-held belief that the Deccan Traps were solid rock and not prone to earthquakes. The needle of suspicion pointed to the reservoir. Sections of earth scientists firmly believed it had triggered the trembler. A raging debate ensued on whether reservoir-induced seismicity (RIS) is a cause for earthquakes. Fifty years hence, scientists think they are close to digging up clinching evidence. The optimism stems from the

10th December 2017 ₹400-crore deep borehole project of the Ministry of Earth Sciences, which has completed a large part of the pilot studies and gathered data from a 3 km borehole.

HALF CENTURY OF RESEARCH

Darth scientist and seismologist Harsh K Gupta, one of the foremost proponents of RIS, backs his nearly half a century of research to claim that Koyna is the best spot in the world to understand how earthquakes occur. The planned 7-km-long borehole, which will go 3-4 km deep and be bent across the Donachiwada fault (mainly responsible for the earthquakes), will unearth all the answers, he told *BusinessLine*. The earthquake activity, which began in 1962, has so far seen more than 200 episodes of 4+ magnitude, and 22 episodes of 5+ magnitude. The biggest, of course, was the 6.3 magnitude quake of 1967. To get an idea, the earthquake had power equivalent to the bomb that struck Hiroshima. An increase of every one point

over a magnitude of 5 adds 30 times more energy release, Gupta explained. Before the creation of the dam — 300 feet tall and 800 feet wide, with the artificial Shivsagar lake — no earthquake was reported in the region. Artificial reservoirs are created for flood control, irrigation and power generation. Globally, there have been about 120 cases of triggered earthquakes. At four places they were above 6 magnitude. These include Kariba on the Zambia-Zimbabwe border (1963), Hsingfenking in China (1961), Kematsa in Greece (1966) and Koyna, which was the biggest, in 1967. The total area impacted was 20 km by 30 km, and there was no other force of earthquakes around 100 km. There are very few instances of near-field study of earthquakes triggered by reservoirs or large constructions. In such regions, earthquakes usually occur at 2-9 km depths, while in known fault zones (such as San Andreas, California) or ruptures and plate collisions (such as Himalayan region), they can happen up to depths of 40 km.

Koyna is best suited for research to unravel the phenomenon, according to the International Continental Drilling Programme, a group of 30 international and 50 Indian scientists, who first met in 2011 at National Geophysical Research Institute (NGRI). The scientists conducted the initial studies using airborne, magnetic, LIDAR and other techniques for three years. In 2014, the group met in Karad, near Koyna, reviewed the progress and decided to go for a pilot, setting up six borehole stations at 1,500 m depths. In 2016, a borehole of 3 km depth was completed and data collected till June 2017, said Gupta. Seismologists argue that large reservoirs can hold more than 1 trillion litres of water that can crack and fissure the insides of the surrounding earth when the water levels inside rise and fall. This can induce weaknesses in the surrounding rock mass and trigger earthquakes. By continuously monitoring the activity around the reservoir, it is possible to predict an earthquake ahead of time. Gupta and a large group of seismologists from NGRI who have been working on the area have developed a model that they claim has been tested over the past few years, and found to be reasonably accurate in terms of time and locate of quakes with 4+ magnitude.

HIMALAYAN TASK

However, it has not been a smooth scientific mission. Questions have been raised about the huge costs and also the practicality in the Indian context, where the threat and chances of a massive 7+ plus quake are more likely in the Himalayan belt.

In contrast, the chances of a Koyna type big earthquake occurring in peninsular India are very rare, maybe one in hundred years. Therefore, the need to understand and strengthen preventive and predictive capabilities in the Himalayan region are greater, contend a large section of seismologists.

Published in:

[The Hindu Business Line](#)