

# INDIA'S BATTLE AGAINST DEADLIEST LOCUST SWARM !!!



**July-September 2020**

Year 02, Volume 02, Issue: No.02

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Published by:


**Navi Mumbai Science Foundation**




 B-51, Gitanjali, Plot No.52, Sector-17 Vashi, Navi Mumbai Pin:400703

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This is a quarterly e-magazine published by Navi Mumbai Science Foundation, a society engaged in spreading science education and scientific temperament among students of Navi Mumbai region for last one decade. The magazine will cover all the activities of the society as well as articles on educating science to the students and teachers.



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Image Courtesy: <http://www.fao.org>

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# From Editor's Desk....



World has witnessed unprecedented situation over last 06 months with number of Covid cases swinging like a pendulum. With the cases in many European countries declining considerably while at the same time new hot spots like Brazil, India, USA are intensifying.

We are entering from the phase of fear to phase of realization. There was much hope from the vaccines during the first phase but now the situation has changed considerably and we have realized that it will take some time and as such we cannot expect much from it in the near future. Therefore, now we have to learn to live with the Covid-19. It is time now to see other side of the story also. The World Health Organization (WHO) and other sources report that malaria, tuberculosis and HIV today collectively kill over 2.5 million people per year. And in 2009 it was reported that this figure was almost 05 million. So, even in recent memory, many tens of millions have died from these three diseases alone. Viral hepatitis kills about 1.3 million per year and road accidents about 1.5 million. Globally, around 09 million die of starvation and related illnesses.

Looking into these figures, we have to seriously think on the Covid condition and learn to live with this virus. It has been well documented that millions of germs exist on human body and Corona virus is one of them. The body has its defence mechanism to fight against these germs. Now we have to improve our defence mechanism/immunity during this pandemic era.

India has boon of strong legacy of Ayurveda where many plant based medicines are described and have been practiced by the people from long time. Now we have to look again these valuable re-sources and work on it to have strong defence mechanism.

Now coming to the development of vaccine, all over the world the people are looking towards scientific community to develop the vaccine. Some people are even trying to blame scientific community for delaying the process. But this needs to be clarified at this point that the development of vaccine is a time consuming task due to many stages of its trials. One can not think and develop a vaccine. It is a continuous process of basic scientific research which takes years together. Scientists spend their whole life to invent particular thing. The message at this junction is that we have to give strong support to basic research which has to be backed by government and equally by the public. We spend millions of rupees for sponsoring cricket events or film event but science based events are not featured that is the main drawback in our society. Let us hope that Covid pandemic will teach this lesson to all of us.



# INDIA'S FIGHT AGAINST DEADLIEST LOCUST SWARM



Common Name: **Locust**

Scientific Name: ***Schistocerca gregaria***

Family: **Acrididae**

Type: **Invertebrates**

Diet: **Herbivore**

Group Name: **Swarm**

Average Lifespan: **Several months**

Size: **0.5 to 3 inches**

Weight: **2-3 grams**

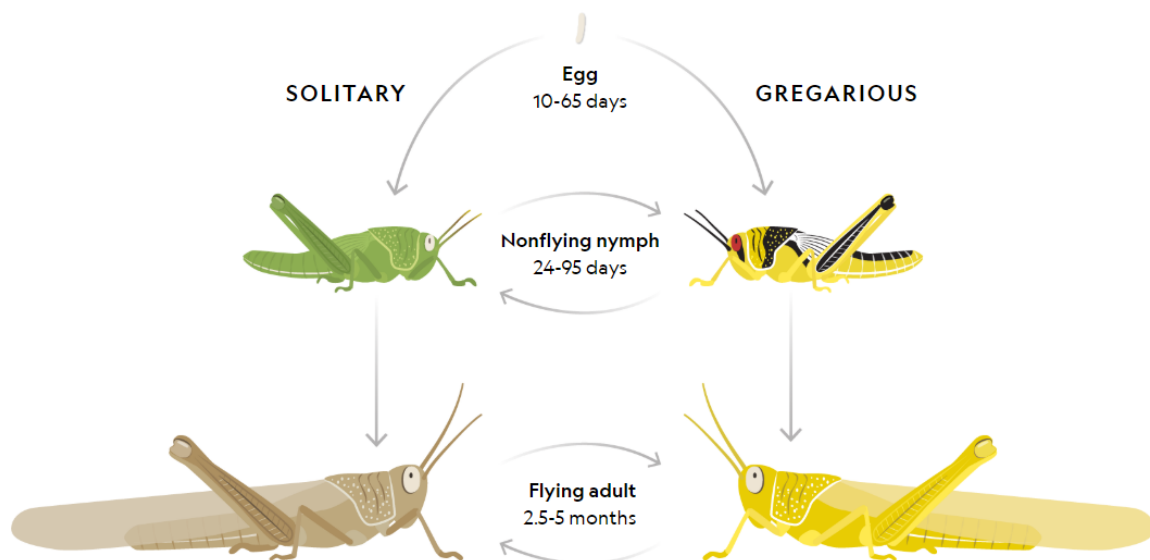
At a time when the Covid-19 pandemic has already disrupted farming, India is facing one of the worst locust attacks in decades which are destroying crops on a large scale and undermining food security of the country. Worse desert locusts have expanded their territory in India both in terms of time and space — they are now coming early, staying longer and foraging deep into the country. The desert locusts have damaged crops in various parts of the country, including the heartland states of Madhya Pradesh, Rajasthan and Uttar Pradesh. Soon after invading districts of the heartland states, locusts have now reached Gujarat, Punjab and other parts of the country, forcing the government to declare a state-wide alert. In the state of Rajasthan alone, the locust have affected more than 90,000 hectare across 20 districts. The hopper bands and immature adult groups resulting from this large-scale breeding are the ones that started arriving in Rajasthan during the first fortnight of April. The Union Agriculture Ministry's Locust Warning Organisation then observed "low-density I & II instar gregarious/transient hoppers" at Jaisalmer and Suratgarh in Rajasthan and Fazilka in Punjab adjoining the Indo-Pakistan border. Subsequently, there has been arrival of swarms from the main spring-breeding areas. And these swarms have come not only to western Rajasthan, but also moved to the eastern parts of the state and even Madhya Pradesh and Maharashtra. Much of this movement, it seems, was aided by the strong westerly winds from Cyclone Amphan in the Bay of Bengal.

Uttar Pradesh and Chhattisgarh reported sightings of locust swarms for the first time since 1962, Maharashtra since 1974 and Madhya Pradesh and Punjab since 1993.

The Food and Agriculture Organization (FAO) predicts locusts could soon reach Odisha and Bihar. They too have not experienced locust attacks in recent decades.

**Life cycle:** Locusts aren't dangerous as long as they are individual hoppers or small isolated groups of insects, in what is called the "solitary phase". It is when their population grows to large numbers – the resultant crowding induces behavioral changes and transformation from the "solitary" to "gregarious" phase – that they start forming swarms. A single swarm contains up to 40-80 million adults in one square km and these can travel up to 150 km in one day.

The FAO has further said that "several successive waves of invasions can be expected in Rajasthan with eastward surges across northern India as far as Bihar and Odhisa". But after some time, there would be westward movements of the swarms, as they will return to Rajasthan on the back of the changing winds associated with the southwest monsoon.



**LIFE CYCLE OF LOCUST:** IMAGE COURTESY: TAYLOR MAGGIACOMO, NGM STAFF. SOURCES: STEPHEN ROGERS, UNIVERSITY OF CAMBRIDGE; STEPHEN J. SIMPSON, UNIVERSITY OF SYDNEY; KEITH CRESSMAN, FAO DESERT LOCUST INFORMATION SERVICE

### Possible reasons of Swarm outbreaks:

- There are many reasons for the swarms in many parts of the world. But main reasons include two meteorological drivers behind the current locust invasions: one, unseasonal heavy rains in the main spring-breeding tracts in March-April and, two, strong westerly winds. For the swarms migrating eastwards – normally they are seen in India only after July post the monsoon's arrival, while confining themselves mostly to the desert areas of West Rajasthan where they breed and exist as solitary insects or in isolated groups.



- As per FAO sources, much of the country's current crisis has caused by the supercyclone Amphan that made landfall on the Sundarbans on May 20. Strong northwesterly winds (that enter from northwest and move towards southeast and east) were established in its aftermath, taking locusts into places as far as Chhattisgarh in the east and Maharashtra in south.
- An analysis of the wind data in six north Indian cities by the International Water Management Institute (headquartered at Colombo), showed there has been a sharp increase in the wind speed at 10 metres above the ground from mid-May onward which has helped the locust move from Rajasthan to faraway places.
- The large-scale breeding and swarm formation takes place only when conditions turn very favourable in their natural habitat, i.e. desert and semi-arid regions. These areas should get rains that will produce enough green vegetation to enable both egg laying and hopper development. It appears that such conditions have been there since the start of this year. The main locust breeding areas in the Horn of Africa, Yemen, Oman, Southern Iran and Pakistan's Baluchistan and Khyber Pakhtunkhwa provinces recorded widespread rains in March-April. East Africa, in fact, had its wettest rainfall season in over four decades even during October-November.
- Wind is not the only factor responsible for this unusual spread. According to the FAO, even before Amphan hit the country, dry conditions prevailing in the west forced immature adult swarms to move eastward, who reached Ajmer by mid-May and Indore in Madhya Pradesh on May 21.
- It is said that the rain also triggered dormant locust eggs to hatch. Just nine months and three generations later, locusts had increased by 8,000 times and were ready to expand their territory. In the summer of 2019, they jumped the Gulf of Aden and moved to Ethiopia and Somalia. That period was marked by an even stronger positive IOD (Indian Ocean Dipole -a natural pattern of changing temperature gradients) resulting in the highest eight cyclonic events in a year.
- There are other theories of swarm outbreak like presence of hormone Serotin, could trigger the solitary insect into swarming behaviour.

### **Control measures:**

There are many methods reported for control of locust swarms, The best strategy, by and large is to detect the swarm and kill it as it moves. Staying alert is one way to gain the upper hand in a battle. But understanding the changing strategy of the enemy is equally crucial, particularly if it is a trans-boundary pest with an ability to travel 150 kilometers a day riding the wind current.



While locusts only nibble away the leaves of mature trees, they can gobble up entire saplings in a single morning, leaving no trace of vegetation. Spraying of any chemical insecticide helps in controlling the pest. But being spread on large area, spraying at individual levels doesn't help much. So community level spraying or aerial spraying is useful for controlling this insect.

When flying locusts are about to descend in large swarms in cultivated areas, the best way to tackle them is to prevent them alighting by all possible methods. To repel locust swarms, fire and a cloud of smoke are created by burning refuse in many places. To destroy locusts, the first and most important activity is to locate and destroy the locusts' eggs in an organised manner by ploughing, harrowing and digging. The FAO has recommended the use of a fungus called *Metarhizium anisopliae*, which kills locusts by growing inside their bodies. It is cheaper than other methods, more effective, longer-lasting in the deserts, easier to store and is recommended for use before the nymphs begin to fly.

As of now, desert locusts are causing outbreaks in at least 10 other countries in the Horn of Africa and southwest Asia. Though the scale and intensity of the infestation is said to be the worst in decades, the FAO describes this an "upsurge", meaning locusts have been able to breed uncontrolled for several successive seasons. Let us hope they will be minimized over the period of time.



**Photo: Representative picture of Locust swarm in North India**

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# CHALLENGES FACED BY THE EDUCATION SECTOR DURING COVID-19 PANDEMIC

Pandemic Covid -19 brought in lot of uncertainties and fear to all. Most of the sectors were hit very badly and the education sector was no exception to it. Somewhere, at the end of March, 2020 the country began shutting down schools and other educational institutes temporarily as a measure to contain the spread of the Corona virus. In fact this was the real crucial time for the education sector wherein board examinations, competitive examinations, entrance tests of various universities, among all others are held during this period.

All the transactions of schooling and learning, including teaching and assessment methodologies, were the first to be affected. Only a few private schools could adopt online teaching methods. Whereas, the low income private and government schools had less access to e-learning solutions. The students from lower strata in addition to the missed opportunities for learning got no access to healthy meals during this time which lead to their malnutrition, economic and social stress.

Going by what Sir Winston Churchill had said –‘Never let a good crisis go to waste’. The teaching fraternity took up the challenge of ‘Perform or Perish’ and migrated to online mode of learning. There were numerous opportunities of online learning by attending a number of webinars and online training programs. Kudos to the teachers!!! As they were caught unaware, they got themselves equipped to the new normal of online teaching within no time.

## **Government initiatives in providing digital platforms for the benefit of students:**

The Ministry of Human Resource Development (HRD) offered its digital platforms to educational institutions for encouraging continuation of education. E-pathashala, Diksha (digital infrastructure for knowledge sharing) and Swayam Prabha (study webs of active learning for young aspiring minds) are among some digital platforms run by the HRD Ministry for self-learning. These platforms offer e-learning through web and video courses. Union HRD minister, Ramesh Pokhriyal said, “As the educational institutions have cancelled classes and postponed examinations, I urge education institutions and their students to use the Ministry’s digital platforms for the benefit of students.”

Swayam Prabha is another online portal that fosters self-study, offers massive open online courses (MOOCs) via tutorials, lectures and discussion forums. It consists of DTH channels that provide quality content for higher education from esteemed colleges.



Apart from graduation and post-graduation courses, it also includes 28 course modules developed by NCERT in 12 subjects for classes IX-XII. National digital library is a virtual repository of learning resources with single window search. Nistha (National Initiatives for School Heads' and Teachers' Holistic Advancement) and Diksha are portals providing learning material for the benefit of students, teachers and parents. The website ([www.diksha.gov.in](http://www.diksha.gov.in)) is also available as an app and has received over 55 lakh downloads so far, having delivered 11.8 crore content sessions and 26 crore minutes of usage. The statement mentioned about e-pathshala that offers educational material for students and teachers through a portal as well as an app, is now also available on the UMANG app of the government. The material comes in various formats like audio, video, e-book, flip book and now even in augmented reality format. The portal has 1886 audios, 2000 videos, 696 e-books, 504 flip books and 70 augmented reality e-content on class IX and X science textbooks.

NROER (National Repository of Open Educational Resources), the ICT for school education, provides access to a large number of educational resources from primary to tertiary level in multiple languages. It has a total of 14527 files, including 401 collections, 2779 documents, 1345 interactive, 1664 audios, 2586 images and 6153 videos on different topics of different languages. Manodarpan program has been introduced to monitor and promote the mental health issues and concerns of students and teachers and to facilitate providing of support to address the mental health and psychosocial aspects during conditions like COVID 19 and beyond.

Though the government is putting in great efforts to reduce the digital divide and encourage inclusiveness there are a number of challenges faced by the educational institutions in switching over to online mode. The major issue being that of lack of adequate digital infrastructure i.e. neither proper internet facilities nor technological gadgets/software's are available. Even the students do not possess the essential gadgets required for online learning. As per the findings of a survey carried by MSCERT, in association with UNICEF, only 59% students of general category, 40% of SC and 46% of ST in Maharashtra have access to online learning, 52.3% have no access to smartphones and less than 0.1% of the total students (6855 from 737 schools) surveyed had access to desktops and laptops. Another important reason for poor access or no access to online education is poor internet connectivity and inability to recharge phones.

There is no doubt that the pandemic has transformed the old traditional teaching model to one driven by technology now. Today, due to the disruption in delivery of education the teachers concern mainly revolves around two essentials to learning for online teaching namely, “Engaging and Involving” the students. Teachers find it difficult to ensure whether the students are attentive in online teaching due to the lack of interactions on one to one basis. Also social learning is hampered in the absence of the peers as compared to the regular classroom set up. Students are not happy about learning online totally as it breeds in monotony and boredom. Needless to say then, that a robust multi-faceted strategy is necessary to manage the crisis and build a resilient sustainable Indian education system in the long term.

**Measures to be considered while switching to online teaching:**

- Replace the current delivery and pedagogical methods in school by seamlessly integrating classroom learning with e-learning modes to build a unified learning system.
- To ensure continuity of learning in government schools and universities, immediate measures are essential. Open-source digital learning solutions and Learning Management Software should be adopted so that teachers can conduct teaching online.
- To ensure accessibility of learning to the students the Diksha platform with reach across all states in India, can be further strengthened.
- With a rapid increase of mobile internet users in India, which is expected to reach 85% households by 2024, technology is enabling ubiquitous access and personalization of education even in the remotest parts of the country. This can change the schooling system and increase the effectiveness of learning and teaching, giving students and teachers multiple options to choose from. Inclusive learning solutions, especially for the most vulnerable and marginalized, need to be developed.
- Many aspirational districts have initiated innovative, mobile-based learning models for effective delivery of education, which can be adopted by others.
- Competency-based curriculum and effective educational practices which will develop skills for employability, productivity and well-being are required for the capacity building and all round development of the students.
- Duration of online learning mode need to be standardized by psychological approach.
- Further, it is also important to establish quality assurance mechanisms and quality benchmark for online learning developed and offered by regulatory bodies.

## **Adaptations to online teaching :**

- **Shift from Instructor to Faculty Advisor:** Today's learners are digital natives and due to immense exposure to the digital technologies their mental configuration has changed drastically. They are fast learners with reduced span of attention. So the teacher should be aware of this fact and try to change from being Instructor to Faculty Advisor and adapt accordingly to enhance student engagement and create congenial learning environment,
- **Shift from Traditional Curriculum to digital Curriculum:** The curriculum used in traditional classroom teaching needs to be replaced by e-course material/projects to make the online teaching more effective. Also, the traditional Pedagogy will be obsolete in using it for remote learning .
- **Traditional to Digital leadership:** A planned strategy is not a solution in the new era of disruptions galore. The digital leader has to be equipped to face the unpredictable disruptions. The leader of the institution needs to be a great visionary with flexibility and far sightedness.
- **Shift from Traditional ICT to advanced digital technology:** Just having internet and computers will not suffice, since the entire spectrum of education will be migrating to remote mode, a need arises to have appropriate digital infrastructure. A server with greater bandwidth and provision of various learning platforms to the teachers, for planning, sharing and disseminating all their activities. Faculty Development Programs to be organized frequently in view of the technology advancement happening at exponential growth.
- **From 'Traditional Pedagogy to engaging pedagogy':** There is a paradigm shift from Passive learning to active learning, teacher centered learning to learner centered learning, hence the teacher needs to use various digital techniques which will enhance student engagement. Techniques like using chat box, polling techniques, raise hands, quizzes, role play, games, videos etc be used during daily teaching.
- **Education needs to develop holistic human being** so that the learner learns to balance the life. Today developing skills place a very important role than just seeking knowledge and information. Therefore educational institutions should try to design competency based education. In Conclusion, our education system has this far remained dominantly with the offline mode of teaching students, now the time seems to have come to incorporate online and blended modes of teaching.

Covid-19 has provided a great opportunity to shift from traditional mode of teaching to online mode of teaching.



There is a need to design a robust blended learning system synchronized with mode of educational delivery for near future so that we all get well equipped to face any type of crisis and to sail through it successfully with least disruption.

Our Prime minister's clarion call for **Aatmanirbhar Bharat** has encouraged to embark upon the challenging journey of self reliance. As the country gears up for the long haul, let's move ahead hand in hand for achieving the desired goals in Education.

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Image Courtesy: <https://indianexpress.com/>

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## EFFECT OF LOCKDOWN ON ENVIRONMENT

Pollution has been a major concern for life on earth since about a century now. In recent few decades the awareness about pollution has increased and many governing bodies around the globe have started taking steps to mitigate or at least limit the pollution. However, despite all the efforts taken, due to the increasing pace of industrial and technological development, pollution remains to be an uncontrollable problem.

In December of 2019, the Covid-19 coronavirus first struck in Wuhan city of China and quickly spread in the entire world. In nearly all the affected nations, the government policy responses have mostly been of imposing lockdowns of varying restrictions and durations. Though the world has witnessed many national and even some limited international curfews in the past, like the one during the Second World War, there have been no examples of lockdowns on such big scale as the current one globally ever. Even the worst of pandemics in the history haven't seen such massive and globally spread lockdowns being undertaken to stop spreading the disease.

This complete restriction on most of the human activities have also resulted in bringing up a silver lining on the dark cloud of the pandemic, especially environmental point of view. The first estimates are showing a positive indirect impact of the lockdown on the environment. Many climate experts have predicted that the greenhouse gas (GHG) emissions could drop to concentrations that have never been seen since World War II (Global Carbon Project, 2020).

Due to this lockdown, many industries as well as other regular activities have ground to a halt. Vehicles have disappeared in large numbers from the roads which has caused GHGs to decrease. A sharp reduction in NO<sub>2</sub> concentrations in countries such as France, Germany, Italy, and Spain has been observed (ESA, 2020). The environmental impacts of this global lockdown are difficult to assess correctly in such short period, but many studies have shown a significant change in the pollution trend across many countries.

China has implemented strict restrictions and self-quarantine measures which have resulted in much observable changes in their air pollution. Due to the lockdown, NO<sub>2</sub> levels fell by about 22.8 µg/m<sup>3</sup> and 12.9 µg/m<sup>3</sup> in Wuhan and China, respectively. PM<sub>2.5</sub> levels were observed to have reduced by about 18.9 µg/m<sup>3</sup> in 367 Chinese cities. Also, in Europe, the data given by Copernicus Sentinel-5P satellite showed a significant decrease in NO<sub>2</sub> concentrations over Rome, Madrid, and Paris, where strict quarantine measures were implemented.

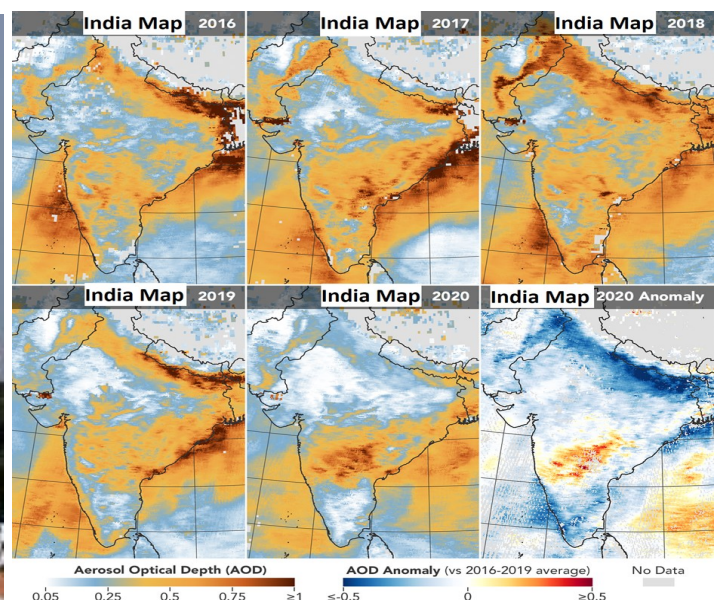
Additionally, the Copernicus Atmosphere Monitoring Service (CAMS) of the European Union observed a large drop of PM<sub>2.5</sub> levels compared to previous years. CAMS showed 20-30% reduction in levels of PM<sub>2.5</sub> in large parts of China compared to last three years (CAMS 2020).

In recent times, the mega cities of India are often listed in the world's topmost polluted cities that exceed the ambient air quality standard. Delhi which is considered to be one of the most polluted cities in the world, showed massive decrease in the pollution levels since lockdown (Photo 1). A one-day study by Central pollution control board (CPCB) on the Janta curfew day showed up to 51% reduction in NO<sub>x</sub> levels and 32% reduction in CO levels during March 22-23, 2020 as compared to March 21, 2020 in Delhi. This is a massive reduction in pollution which has further improved with the progression of nationwide lockdown. The air quality data collected from different cities in India also have shown significant decrease in the pollution levels on the Janta curfew day.

On March 25, 2020, the Indian government declared a nationwide strict lockdown to reduce the spread of the coronavirus. This country-wide restriction has decreased or stopped the operations in factories and severely reduced car, bus, truck, and airplane traffic. After just a week of the lockdown, NASA satellite sensors observed aerosol levels at a 20-year low for this time of year in northern India (Photo 2). These maps show aerosol optical depth (AOD) measurements over India during the same March 31 to April 5 period for each year from 2016 through 2020. Aerosol optical depth is a measure of absorbed or reflected light by airborne particles in the atmosphere. The 2020 (anomaly) map shows a significant decrease in AOD in 2020 compared to the average for 2016-2019.



**Photo 1:** Picture of Gateway of India before and after Lockdown



**Photo 2:** Aerosol Optical Depth map of India (2016-2020)



Similar reductions have been found in the respirable PM<sub>10</sub> particulate levels during the lockdown in these four cities. In Mumbai, the average PM<sub>10</sub> level last year was 82.72 µg/m<sup>3</sup> as opposed to 59 µg/m<sup>3</sup> during the lockdown while Kolkata's was 108.62 µg/m<sup>3</sup> in 2019 compared to 45 µg/m<sup>3</sup> during the lockdown. Delhi's dustload was 216.6 µg/m<sup>3</sup> in 2019 as opposed to only 49 µg/m<sup>3</sup> during the lockdown and Bangalore had an average PM<sub>10</sub> level of 77.52 µg/m<sup>3</sup> in 2019 as opposed to just 14 µg/m<sup>3</sup> during the lockdown.

All this data shows that the coronavirus lockdown has proved to be good for the environment from pollution point of view. The water of rivers like Ganga and Yamuna have been observed to become the cleanest in last two decades. The great Himalayas were reported to be clearly visible from parts of Punjab after about 3-4 decades (Photo 3). Not only there a reduction in pollution levels, but due to the restricted interference of humans, thriving of wild life also has been observed in various parts of the world. The dolphins of the river Ganga were seen in some parts of the river after many years. Various wild animals were spotted openly roaming in many regions across India. Dolphins were also seen at marine drive Mumbai after many years. Fireflies were said to have arrived in highest number in the Bhandardara region in last 10 years. Sea turtles were observed to have laid highest number of eggs on the Konkan shore in last few years.



**Photo 3:** Himalayan ranges were clearly seen after lockdown from many parts of Punja and Hariyana  
Image Courtesy: <https://www.timesofindia.com>

Though this condition of lockdown can not continue for long, and the industrial and other human activities will resume step by step, this lockdown period has shown us some hope to save our environment. This amazingly excellent recovery of nature in just three to four months has shown us the path. We have to learn from this and act wisely in the future so that our planet earth, its beautiful nature, wild life and clean atmosphere can be restored and maintained by us for our own health as well as for all our future generations.

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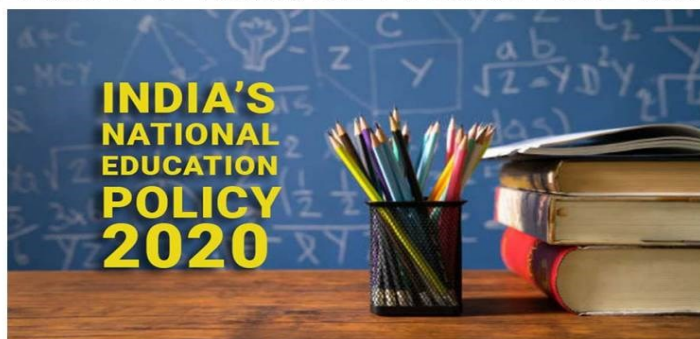
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## **DON'T MISS IT.....** **COMING UP IN NEXT ISSUE No 3** **(October to December 2020)**

- 1. NATIONAL EDUCATIONAL POLICY 2020**
- 2. REVERSE MIGRATION :GOING BACK TO VILLAGE**
- 3. WORLD NUCLEAR ENERGY DAY! 2<sup>ND</sup> DECEMBER**
- 4. STUDENT'S CORNER**
- 5. TEACHER'S PAGE**
- 6. FROM MY BOOK SHELF....SCIENCE AND EDUCATION BASED BOOKS**



**DO YOU HAVE A INTERESTING EDUCATIONAL STORY???**  
**SHARE WITH US!!!!**

## NATIONAL SCIENCE DAY 2020.

National Science Day-2020 was celebrated in association with Rayat Shikshan Sanstha's Karmaveer Bhaurao Patil College (Department of Chemistry), Vashi, Navi Mumbai and Maharashtra Academy of Sciences (Mumbai Chapter) on 28<sup>th</sup> February, 2020.

Need of such celebrations are essential in the present scenario to show the present student community about the huge strides made by independent India in the field of education and "engineering & technology". While progress in education was phenomenal, it remained confined, more or less, to lateral growth. The emphasis here was so immense that we lost sight of vertical growth i. e. growth of "centers of excellence" in science & technology became a casualty. As a result, the real talent started migrating in search of greener pastures & the trend still continues. It is now time to review our educational system and make it broad based, i. e. laying equal emphasis, if not more, on R & D effort.

The effort should be so intense that it leads to trend reversal among migrating real talent. While doing so, we need to remind our younger generation that India too had a rich past in scientific achievements in the fields like Mathematics, Astronomy, Medicine & Metallurgy which covered our country with glory for more than two millennia before the 12<sup>th</sup> century AD. Revival of the past glory should not, therefore, prove to be a daunting task.

It may then be easy to understand why NMSF, KBPC and MASc (MC) have come together to revitalize the idea of **"National Science Day"**. It will also bring in focus the fact that India is a parched country as far as the count of homegrown Nobel Laureates in science is concerned. The last Indian Nobel Laureate in science stream was seen on the world stage in the year 1930. The wait has been too long to be ignored any longer.

**Accordingly, the event was divided in two main parts:**

**In the first part,** the focus was on United Nation's **"International Year of Periodic Table-2019"** which was fully implemented by the students. The event started with all 118 elements being displayed with placards by many students arranged in the periodic table format on the steps of the garden around the statue of Karmaveer Bhaurao Patil in the college premises. The event became lively when a few elements were randomly selected and the concerned students were asked to explain their properties and uses.

**In the second part,** three invited talks were arranged on the noble prize-winning topics for the year 2019 in the field of Physics, Chemistry and Physiology/Medicine.



**1. The talk on Nobel Prize in Chemistry** was delivered by Dr. Haridas Pal, Ex-BARC scientist. As elaborated by him, the 2019 Nobel Prize in Chemistry was awarded to John Goodenough, M. Stanley Whittingham and Akira Yoshino “for the development of lithium-ion batteries”. This light-weight, rechargeable and powerful battery is now being used in everything from mobile phones to laptops and electric vehicles. It can also store significant amounts of energy from solar and wind power, making possible a fossil fuel-free society. These scientists have literally created a re-chargeable world.

**2. The talk on Nobel Prize in Physiology or Medicine** was delivered by Dr. Vipul K Pandey, BARC. As elaborated by him, the 2019 Nobel Prize in Physiology/Medicine was awarded jointly to William G. Kaelin Jr, Sir Peter J. Ratcliffe and Gregg L. Semenza for their discoveries on how cells sense and adapt the oxygen availability.

Animals requiring oxygen for the conversion of food into useful energy has been long understood, but how cells adapt to changes in levels of oxygen was unknown. The winners discovered how cells can sense and adapt to changing oxygen availability. They identified molecular machinery that regulates the activity of genes in response to varying levels of oxygen. Their discoveries have also paved the way for promising new strategies to fight anemia, cancer and many other diseases.



**Photo 1.** Inauguration programme. Invited speaker, Dr. Haridas Pal, being honoured by the college principal, Dr. V. S. Shivankar.

**3. The talk on Nobel Prize in Physics** was delivered by Dr. Subir Bhattacharyya, a scientist presently working at BARC. As elaborated by him, the Canadian-US scientist James Peebles won his half of the prize for his work in predicting cosmic microwave background and creating a theoretical frame work from which other scientists have been able to calculate the age and structure of the universe, including the calculation that the universe is 95% dark matter and dark energy.

Queloz and Mayor, both from Switzerland, won their prize for discovering the first known exoplanet in 1995. The planet was a Jupiter-like gas giant and about 50 light years away from Earth. Since their discovery, over 4000 other exo-planets have been discovered. These efforts try to answer the questions about: 'Are we alone - is there life anywhere else in the Universe?

All the three talks were lucidly presented by respective speakers & were heard with engrossed attention. Each talk was also followed by a few questions from the audience.



**Photo 2.** Drone photo of the display of the "Periodic Table" by students on the steps of garden.





**Photo 3.** The display of "Periodic Table" being keenly watched by the principal, college staff, invited speakers and members of NMSF group.



**Photo 4.** Display of specialties of some of the elements with "RANGOLIES" and the students with names of elements

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# Students Corner...



## THE FACT IS TOO EGGY!



The advancement of mankind in both technology and invention was possible only due to his curiosity, to ask question like WHY and HOW. Why is the sky blue? Or how big is the universe? But have you ever wondered what happens inside an egg?. How the chick breathes or gets its food? Well, here's the reason..... If you have ever eaten a fried or a boiled egg, you must have noticed the whitish part and the inner yellow part known as the yolk. The yolk has a small white spot on it which is known as the egg cell from which the inner chick develops. Human babies, like all other mammals, develop inside the mother's womb and receive oxygen from the umbilical cord. But the egg of a bird does not possess such organs to breathe in oxygen and give out carbon dioxide. So what does it do? When eggs are laid by the mother, they are warm. As they cool the material inside the egg shrinks a bit. The two membranes pull apart a little and create a small pocket or sack of air. As the developing bird grows, it breathes in oxygen from the air sack and exhales carbon dioxide. Around 7000 microscopic pores present all over the surface allow the carbon dioxide to escape and for fresh air to get in. These pores also allow moisture to get in to keep the developing birds and egg parts from drying out.

Here's an interesting fact for you-The chick usually prepares to hatch around day 20, and at that time you will be able to hear chirps from inside the egg. If you place a candle near the egg, you will be able to see the chick's head poking into the air cell. If the chick is too dry, too hot or too cold during any point in the incubation period, it could stop the chick's development. When the chick breathes air for the first time, you may hear the chick's pipping sound from inside. This is called pipping of the chick. The chick uses its egg tooth to pip its way around the inside of the shell. The chick pecks at the shell, rests, pecks again and rests again. Finally, when the chick is ready, it cracks open the egg shell and makes its way out of the shell, wet and tired.

And that's my friends, is the story of the chick inside the egg.

**Master Darshith Arun Shetty**

St. Marys Multipurpose School,

Vashi, Navi Mumbai



# NMSF EVENTS CALENDAR 2020

Su	M	Tu	W	Th	F	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

**Science Utsav**

Su	M	Tu	W	Th	F	Sa
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**National Science Day**

**Fun with Science from 15 Feb to 15 March**

Su	M	Tu	W	Th	F	Sa
1	2	3	4	5	6	7
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**Pre-RMO**

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31						

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**HBBVC Classes April to September (except May) every Sunday**

Su	M	Tu	W	Th	F	Sa
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**RMO & Science Club every Sunday**

**Nobel Laureatism writing**

Su	M	Tu	W	Th	F	Sa
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29	30					

Su	M	Tu	W	Th	F	Sa
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20	21	22	23	24	25	26
27	28	29	30	31		

**Nobel Laureatism oral**

**HBBVC practicals full day**

**World Nuclear Energy Day**



**HAPPY INDEPENDENCE DAY 15TH AUGUST 2020**