

PR SENSE

Spreading Positive Vibrations
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Cover Story of the Month



Green Energy

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Contact

editor@corpezine.com
www.corpezine.com
www.digitalpresense.com



From the Desk of Editor-in-Chief

Greetings from all of us @ The Editorial Team to our readers.



The month of November witnessed another natural disaster when the Gaja Cyclone hit the south of India again. This month's editorial highlights the tragedy of the recent natural disasters and the lessons we must learn from them to equip ourselves and the disaster management authorities better against such occurrences in future.

We remember another tragedy that occurred a decade ago in Mumbai – that of 26/11, and once again pay homage to the martyrs and other victims of that fateful day. Time has passed..... The scars remain even as life has moved on.

The 97th birth anniversary of Verghese Kurien, social entrepreneur and Father of the White Revolution in India, was celebrated as the National Milk Day on November 26th. He was responsible for converting a milk-deficient country to the world's largest producer of milk. We salute him. India is in dire need of more such social entrepreneurs and leaders.

We are aware that India is currently a country with a deficit in energy supply. This month's cover story discusses the scope of overcoming this crisis and suggests a policy and strategy to ensure a simple, cost-effective, green source of energy that can light up our villages through self-generating projects. This could be the way forward to a similar revolution like the White Revolution that Kurien brought about.

In another article, we take a look at the recipients of this year's Nobel Awards and Prizes, and their respective inventions that won them the recognition. We also bring you a snippet about the significance of the national Constitution Day, celebrated on November 26th.

And thanks to the dedication and commitment of one of our national sportspersons, our world class boxing champion, Mary Kom has recently created record with the highest number of world championship titles to her credit.

Prince, as usual, makes his unflinching presence and wit.

I hope you will enjoy this edition. Please share your feedback with us at editor@corpezine.com. Your feedback is important to us.

Susan

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the third edition of the Digest titled PreSense130,
containing select articles from 130 issues of the ezine PreSense.**

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Editorial

Lessons from the National Disasters



The Gaja Cyclone that occurred in early November 2018, devastated six districts of the Delta Region of Tamil Nadu State, leaving lakhs of people homeless. The Delta Region of Tamil Nadu, known as the 'granary of South India', is in shambles. Innumerable trees, including coconut trees that provided livelihood to families, have been uprooted. Around 3.5 lakh houses have been completely damaged. Nearly 5,000 cattle have been lost. Many boats of fishermen have been destroyed, depriving them of their sole means of livelihood. It is estimated that it would take 5 to 10 years for the people to return to normal life. More than 1 lakh electric poles have been damaged, causing disruption in power supply for 10 days.

Fortunately, loss of life was minimal due to preventive measures taken by the Tamil Nadu Government. A team from the Central Government has assessed the intense damage caused in the Delta Region. A study by the Anna University estimates the damage caused to the Delta Region as greater than that caused by Tsunami in 2004.

Sadly, in spite of the huge devastation of the fertile Delta Region, the national media has not focused enough on this catastrophe in their news coverage. These national channels seem to find some less critical issues occurring in and around Delhi, more important than that about the affected Delta Region. Is it necessary to remind them that India extends down south upto Kanyakumari?

During the past four months, India faced severe disasters in the states of Kerala, Odisha, Andhra Pradesh and Tamil Nadu. In the Kerala floods, loss of life rose to 500. In the Titli Cyclone in Odisha and Andhra Pradesh, around 100 people lost their lives. In the recent



Gaja Cyclone, Tamil Nadu lost around 65 lives. In all the three disasters, there was huge loss and damage to property and livelihood.



The State Disaster Management Authorities in these states faced challenges in anticipating and managing the disasters, due to lack of impact-based actionable early warning information. The Authorities also faced challenges due to the non-cooperation of some of the affected people, who refused to be evacuated because they did not want to leave their properties. This bad decision had even cost some of them their lives.

The Central and State Governments need to study these disasters and the lessons from them in order to avoid or at least reduce the impact of such damages in future.

1. Although the Disaster Management Act 2005 emphasises regular training of the officials and the people to prepare them for such disasters, it is not done earnestly and effectively. The training is carried out more as a matter of routine and for the record.
2. Floods and cyclones have become especially catastrophic because of the destruction of nature by the society. The Kerala floods is attributed to deforestation and poor maintenance of the Western Ghats. In Tamil Nadu, filling of lakes and ponds for construction of real estate, destruction of trees, and the removal of sand from the rivers have caused the intense damage.
3. Village *panchayats* and local bodies form the backbone of democracy in India. There is no *panchayat* or local body in Tamil Nadu as elections for those posts have not been held for the past two years. This absence of local body leaders created many difficulties during the evacuation and rehabilitation exercise.

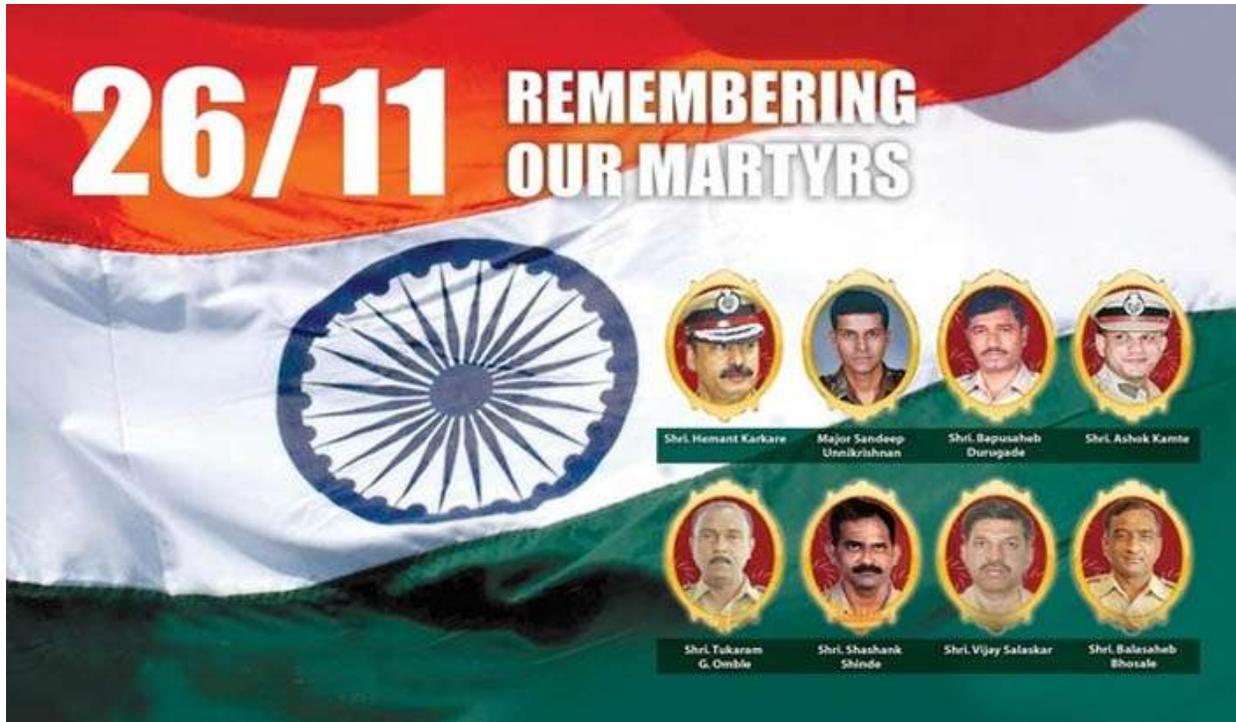
PreSense appeals to the Members of Parliament to raise this critical issue of recurrent national disasters and their disaster management, during the Winter Session of the Parliament, and formulate guidelines to manage such disasters effectively in future.

by K. Srinivasan, Publisher and Mg. Editor



Homage

Remembering the Martyrs and Victims, A Decade after 26/11



It is a decade since India's horrific experience under the inhuman and evil hands of terrorism when it struck Mumbai, leaving over 160 dead and many injured, and many more scarred emotionally. Along with the common people fatally caught in the firing were martyrs from the Police, and Commandos of the National Security Guards. After 60 gruelling hours, fighting against 12 coordinated shooting and bombing attacks, the terrorists were gunned down, one was caught alive, the hostages were rescued and the seized places were secured.

India and Mumbai rose again in its fighting spirit after the tragedy. When the prestigious Hotel Taj Mahal Palace, which was one of the prime scenes of the 26/11 attack, was restored to its past glory within a year thereafter by Ratan Tata, he dedicated it to the memory of the 31 employees and guests, killed in the attack, and to the resilience of the people, who rose again from those ashes, back to their lives and livelihood.

We remember with reverence the hapless victims and salute the martyrs. We acknowledge the great support given by the Mumbai Police, the National Security Guards with their Commandos, risking their lives. We also acknowledge the survivors who have picked up the threads of life again after the tragedy, some even with professional aid in therapy.

Editorial Team



Cover Story

Energy from Toilet Waste – Bringing Power to India

A recent news report confirmed that the Indian Rupee recovered sharply against the US Dollar, following a crash in the international crude oil prices. This respite is attributed to the 6-month waiver granted by USA to India on Iran sanctions. One must wait and watch the situation after the 6-month waiver expires and India must cease all imports from Iran, to adhere to USA's diktat. India has been one of the largest importers of oil from Iran. Such is the extent of India's dependence on imported oil for its domestic energy consumption needs.

Energy is an essential commodity in our lives for use in domestic and public lighting, running of essential machinery, transportation, travelling, in agriculture, manufacturing and service industries. Currently, India is dependent on imported oil to meet its energy requirements and the volatility of fuel prices, and unstable political and economic situations around the world, is not making it easy for India to ensure stable and affordable power resources. In this backdrop of bleakness and uncertainty, it is imperative that India looks to alternative means and strategies to ensure it does not plunge into darkness and to a grinding economic halt for want of sufficient power for its people.

India's focus for the power sector should be three-fold:

- Energy security – providing affordable, accessible energy to meet the growing demand.
- Energy independence - reducing the dependence on foreign resources or fossil fuel, and generating our own renewable resources to meet the growing needs. Fossil fuel is from coal, petroleum, diesel and natural gas.
- Reduction of carbon emission by cutting down on fossil fuel consumption and generating green power. This is possible by migrating to renewable energy resources, viz solar, wind, nuclear, biogas and hydrogen.

Current Power Situation in India

India is dependent on fossil fuel today for 75% of its total energy consumption. It is feared that the supply of fossil fuel would be depleted in another 20-30 years' time. The situation of fossil fuel dependency is somewhat similar the world over but every country has its own energy resource mix policy. For example, developed and cash-rich countries with advanced economies preserve their available indigenous energy resources for future, and are able to afford to buy energy resources from abroad for their present requirement.

For India, the way forward to resolve this energy crisis is to develop an effective technology to tap renewable energy resources. Today, only 5% of the country's energy consumption is from renewable energy resources.

Currently, India's energy consumption totalling 343,000MW (megawatt) (200,000MW in 2005, and projected to reach 450,000MW by 2030) is met from:

- fossil (coal, gas, diesel) – 220,000MW (energy efficiency of 60-75%)
- solar, biofuel, wind – 69,000MW (energy efficiency 35%)
- hydro – 45,000MW (energy efficiency 40%)
- nuclear – 7,000MW (energy efficiency 95%)

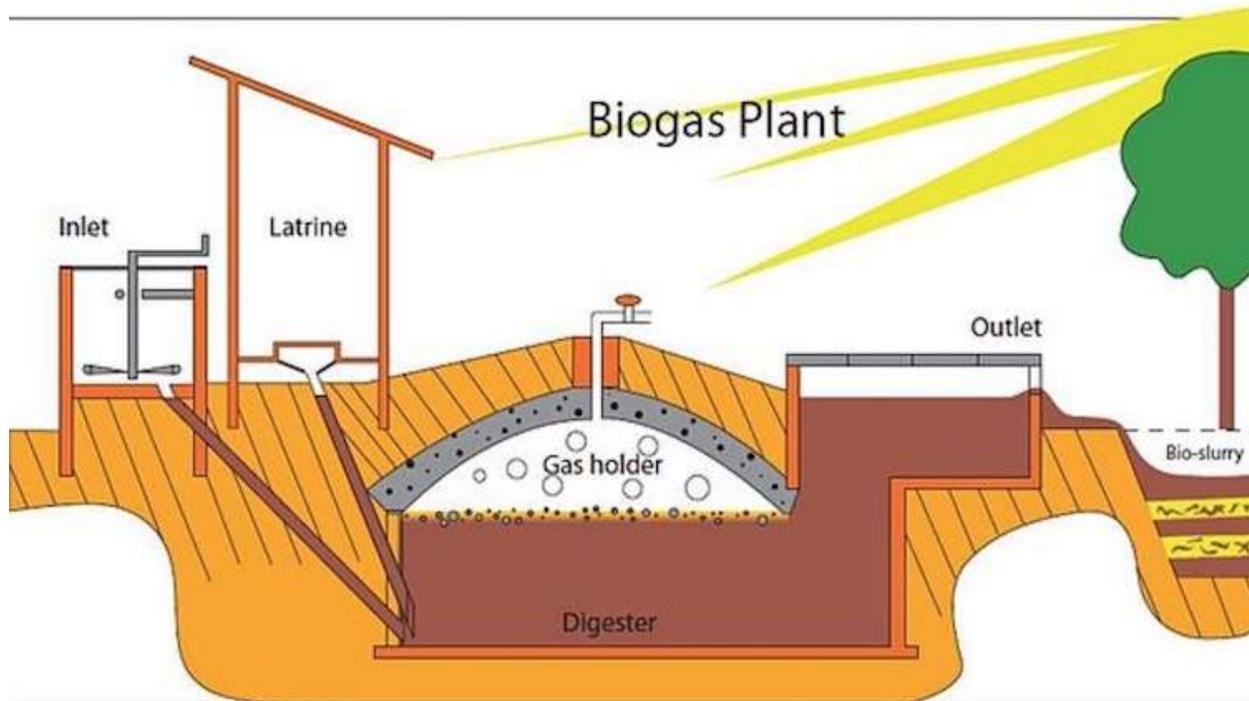


(Energy efficiency is the percentage of actual utilisation of energy from the supply available, excluding waste such as distribution leaks and pilferages.)

Interestingly, 1,000 MW of the total nuclear energy resource is from Tamil Nadu (Kudankulam and Kalpakkam projects).

The country sources renewable energy from wind (32,000 MW, of which 8,000 MW is from Tamil Nadu, especially Kanyakumari District, which supplies 5,000MW), solar (10,000 MW), biomass (8,000 MW), small hydro projects (4,500 MW) and municipal waste (1,000 MW). While

Energy Generation from Toilet



The ideal renewable energy source to be tapped, especially at the grass root level of villages, to bring India to an energy-sufficient level is municipal waste. Municipal waste is toilet waste. If toilet waste is collected through a centralised drainage system in every village or locality, this can be a valuable, sustainable and economical source of energy to light up every house and meet much of the local energy requirements. Toilets in villages, including those constructed under the *Swachh Bharat Abhiyan* (Clean India Mission) are currently constructed as individual pits. These pits can also pose a health threat by contaminating groundwater and its TDS (total dissolved solids). If these pits are connected to a centralised biodigester plant and the waste treated, it would provide a source of energy and revenue for the villages.

The *panchayat* of an average village, with a population of 2500, has the capacity to generate 50-100 kW (kilowatt) from a municipal waste power generation project. Similarly, an urban municipality can generate 1MW, and an urban corporation can generate 5-10MW.



Tamil Nadu State for example, has 153 municipalities and 14 corporations. The investment for generation of 1MW energy from municipal waste is estimated at Rs.20-30 million.

The *panchayat* of an average village, with a population of 2500, has the capacity to generate 50-100 kW (kilowatt) from a municipal waste power generation project

Thirty-one educational institutions and industrial entities in Tamil Nadu have successfully implemented the municipal waste energy project which generates around 1392 kW in total. Two of the initial projects implemented are in Tamil Nadu – one at Sastra University which generates 72kW, and the other at Periyar PURA at Periyar Maniammai University which generates 60kW power. These projects in Tamil Nadu were

inaugurated by late Dr A.P.J Abdul Kalam (11th President of India) in 2009. With the implementation of this project, the universities are able to meet their captive energy requirements from the energy generated through the project. Two industrial entities in Tamil Nadu are generating 200kW each.

Unfortunately, the concept has not yet been successfully implemented at the village level because of the lack of coordination among the people required to be involved, viz. the Government (both State and Central), institutions, village *panchayats*, research departments and corporates. The participation of corporates through their CSR (Corporate Social Responsibility) plans is critical here. The cost of the project is estimated at Rs.25 million which includes installation of centralisation drainage of toilets – Rs.10 million, central bio-digester plant – Rs.5 million, accessories – Rs.10 million.

Economics of Municipal Waste Energy Project

The process involved in the municipal waste energy project is as follows:

- When a village having 1,000 houses with toilets implements the project, 100 kWh energy can be generated per hour per village.
- At an average of 12 hours of generation per day, it generates 1200 kWh energy per day.
- By installing solar beams for solar energy generation, the captive energy requirement and public lighting can be met so that the municipal waste energy generated is available for sale to the Government grid @ Rs.3.47/- per kWh. The total revenue for the village per day will thus be Rs. 4164 and Rs. 124,920 per month or Rs. 1.5 million per annum.
- The RoI (Return on Investment) is achieved in 5 years' time, and there will be surplus revenue generated thence, available to the village *panchayat* for spending on the village, instead of depending on government disbursed funds.
- There could be public-private participation of say, 25% by the village *panchayat* and 75% by social enterprises like the Government (subsidy), banks (loans) and corporates (grants through CSR).
- An alternative is for each corporate to adopt at least one village, investing a maximum of Rs.20-25 million, so that the 200,000 village *panchayats* can be adopted by corporates under their CSR commitment.
- This project will also provide employment to the youth of the village at the rate of at least five youngsters per project, as they will run and maintain the project and ancillary enterprises.



A critical pre-requisite for this project is segregation. Rainwater harvesting facility should be installed to direct rainwater to the local ponds and lakes. Rainwater harvesting in individual homes will take the rainwater to self-owned sumps and water tanks. Bathroom/kitchen waste must be segregated from toilet waste before treating them separately. Bathroom waste can be used for outdoor water requirements and toilet waste can be used for energy generation.

Unfortunately, there has been little coordination among the governments, institutions and corporates. In spite of successful technological researches accomplished by the Government research departments, these lie underutilised and not implemented. As Shri V. Ponraj, former Scientific Advisor to late Dr Kalam reflected with regret, "India has islands/beads of success, but no one is making a garland out of these successful researches." Shri Ponraj had been associated with Dr Kalam in evolving the Energy Independences Vision 2030, propagating and promoting the concept of generating sustainable energy from renewable resources at affordable cost. He sees immense scope in this project, as according to him, India has 200 million houses, out of which 40 million houses remain without electricity.

In 2014, Dr Kalam had proposed the municipal waste energy generation concept while presenting the PURA (Provision of Urban Amenities to Rural Areas) Scheme, conceptualised by him for providing economic opportunities outside of cities. He had also detailed it in his book, 'A Manifesto for Change'.

"India has islands / beads of success, but no one is making a garland out of these successful researches."

– V Ponraj, Former Advisor to Late Dr. APJ Abdul Kalam

Interestingly, Shri Ponraj had also recommended adoption of the Municipal Waste Energy Project in the Shyama Prakash Mukherjee RURBAN Mission (SPMRM) of the Government of India, launched in February 2016. SPMRM envisages development of rural growth clusters in all the states and Union Territories of the country to trigger overall development, by providing economic activities, development of skills and local entrepreneurship and infrastructural amenities. So far, there is little positive response to this recommendation.

Initiating Small Steps Towards Rural Development

In 2017, Ponraj with his team of people, adopted 24 villages in the district of Cuddalore in Tamil Nadu and initiated Dr Kalam's PURA scheme, with the support of the Cuddalore District Administration and funding by the Tamil Sangam, USA. The mission is threefold:

1) providing safe drinking water, 2) segregating the drainage system, and 3) connecting the toilets for implementing the municipal waste energy generation. The scheme has completed the first phase of the mission and 40,000 litres of RO-treated drinking water is generated from the local sources for the villagers. 'ATMs' have been installed in the villages to provide drinking water @ Rs.3 per litre.

The successful implementation of the Municipal Waste Power Generation Project will help in creating a clean, green and carbon-neutral India. We all could then dream of a country that is truly and rightfully an "Incredible India".

**by Susan Koshy, Editor-in-Chief,
with input from Shri V. Ponraj, Former Scientific Advisor
to late Dr A.P.J. Abdul Kalam**



International

When It's December, We Greet New Nobel Laureates!

On December 10th every year, the Nobel Prize winners for the year are awarded the most coveted prize on earth – the Nobel Medal and the Diploma – by the King of Sweden. This year, King Carl XVI Gustaf of Sweden will present the Nobel prizes to those who are being recognised for contributing to the greatest benefit of humankind in Physics, Chemistry, Physiology or Medicine, Literature and Peace.

The Nobel Prize was instituted by the last will and testament of the inventor of dynamite, Alfred Bernhard Nobel. The Nobel Awards and Prizes have been awarded since 1901. In his will dated November 27, 1895, Alfred Nobel had stated, "It is my express wish that when awarding the prizes, no consideration be given to nationality, but that the prize be awarded to the worthiest person." The Nobel prize winners are selected by an extraordinarily neutral and impartial process. No information of the selection process can be revealed for a 50-year period. Let us see the discoveries made by the scientists who will receive the award this year.

Nobel Awards and Prize for 2018

Nobel Award for Physics: Arthur Ashkin invented optical tweezers that can grab particles, atoms, viruses and other living cells with their laser beam fingers. A major breakthrough came in 1987 when Ashkin used the tweezers to capture living bacteria without harming them. He was able to study the biological systems. Optical tweezers are now widely used to investigate the machinery of life.



Gérard Mourou and Donna Strickland paved the way to the creation of the shortest and most intense laser pulses. Their revolutionary article was published in 1985 and it was the foundation of Strickland's doctoral thesis. Using an ingenious approach, they succeeded in creating ultrashort high-intensity laser pulses. Its uses include millions of corrective eye surgeries (*see adjoining picture*) that are conducted every year using the sharpest of laser beams.

The innumerable areas of application of the discoveries of these scientists have not yet been completely explored. However, even now, these inventions allow us to rummage around in the microworld in the spirit of Alfred Nobel's will – for the greatest benefit of humankind. These three great scientists are awarded the 2018 Nobel Prize for Physics.

Nobel Award for Chemistry: This year's Nobel Laureates in Chemistry were inspired by the power of evolution and used the same principles – genetic change and selection – to develop proteins that solve mankind's chemical problems.

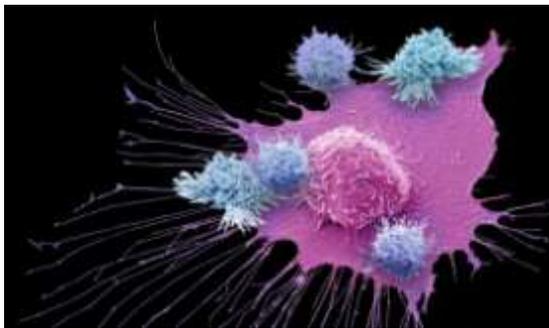
In 1993, Frances H. Arnold conducted the first directed evolution of enzymes, which are proteins. The enzymes developed by Frances Arnold are used in the manufacture of chemical substances that are more environmentally friendly, such as pharmaceuticals, and in the production of renewable fuels for a greener transport sector. In 1985, George P. Smith developed an elegant method known as phage display, where a bacteriophage – a



virus that infects bacteria – can be used to evolve new proteins. Sir Gregory Winter used phage display for the directed evolution of antibodies, with the aim of producing new pharmaceuticals. The first pharmaceutical based on this method called adalimumab, was approved in 2002 and is used for rheumatoid arthritis, psoriasis and inflammatory bowel diseases. Since then, phage display has produced anti-bodies that can neutralise toxins, counteract auto-immune diseases and cure metastatic cancer.

Physiology/Medicine Nobel Prize: Cancer kills millions of people every year and it is one of humanity's greatest health challenges. By stimulating the inherent ability of our immune system to attack the tumour cells, this year's Nobel Laureates have established an entirely new principle for cancer therapy.

James P. Allison studied a known protein that functions as a brake on the immune system. He realised the potential of releasing the brake and thereby unleashing our immune cells to attack the tumours. He then developed this concept into a new approach for treating patients for cancer.



Tasuku Honjo discovered a protein on immune cells and, after careful exploration of its function, eventually revealed that it also operates as a brake, but with a different mechanism of action. Therapies based on his discovery proved to be strikingly effective in the fight against cancer.

Allison and Honjo showed how different strategies for inhibiting the brakes on the immune system can be used in the treatment of cancer. The seminal discoveries by the two Laureates

constitute a landmark in our fight against cancer.

Nobel Prize for Peace: This year's Nobel Peace Prize is firmly embedded in the criteria spelled out in Alfred Nobel's will. Denis Mukwege and Nadia Murad have both put their personal security at risk by courageously combating war crimes and seeking justice for the victims. They have thereby promoted the fraternity of nations through the application of principles of international law.

Nobel Prize for Literature: For the first time since 1949, the Secretive Jury that hands out the world's most prestigious Literary Nobel Prize, has announced that there will be no recipient for the Nobel Prize for Literature this year, but it will be given to two people in 2019.

Epilogue: This year 12 new laureates have been recognised for the Nobel Awards and Prizes for achievements that have contributed to the greatest benefit to humankind. Their work and discoveries range from cancer therapy and laser physics to developing proteins that can solve humankind's chemical problems. The work of the 2018 Nobel Laureates also include combating war crimes, as well as integrating innovation with economic growth.

India is a country with the youth forming a majority of its population. It is the dream of every Indian to see a young Indian win the most coveted Nobel prize in the coming years.

by Dr R. Jagannathan, Editorial Advisor





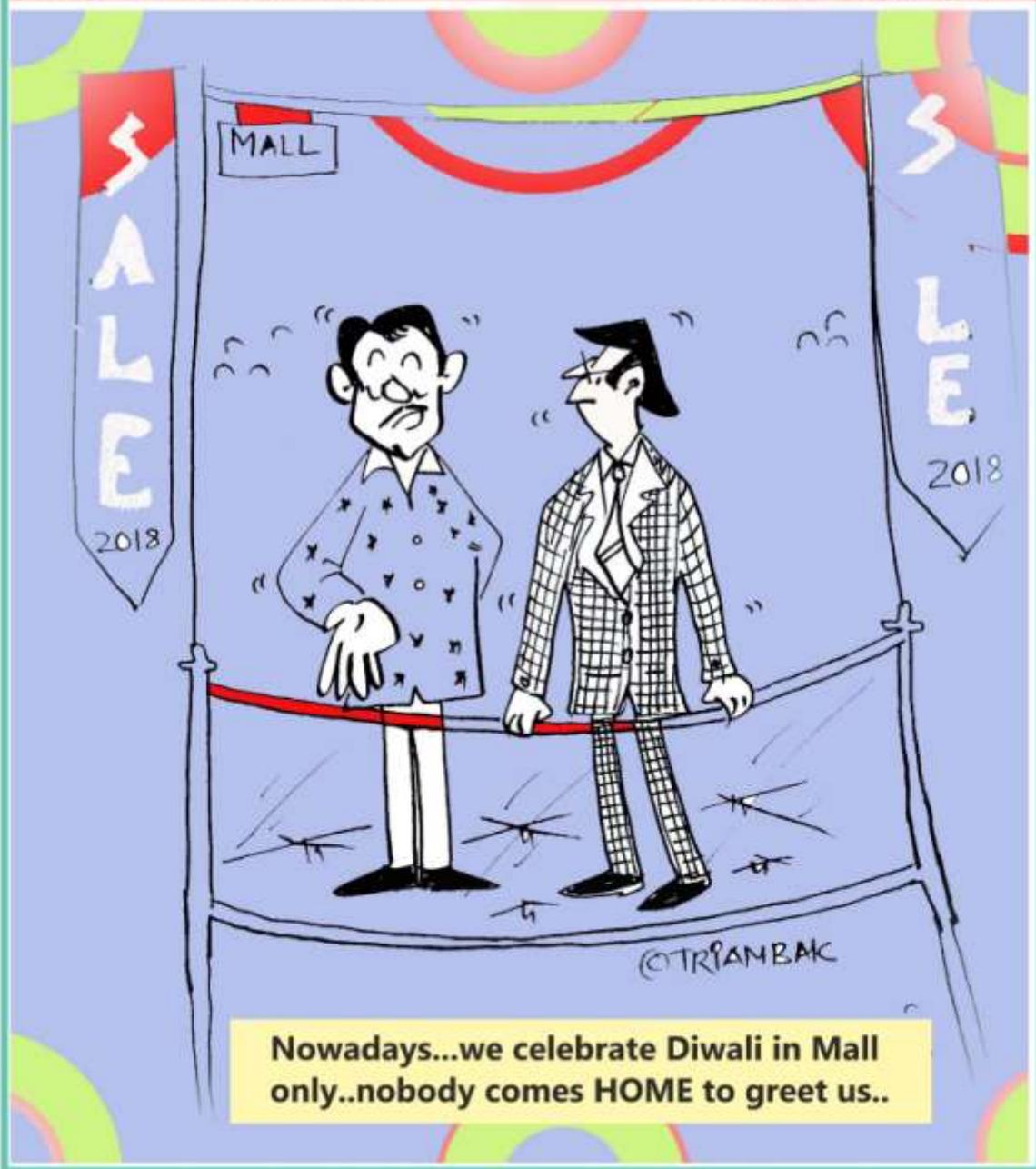
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By- Triambak Sharma



www.cartoonwatchindia.com

cartoonwatch@gmail.com



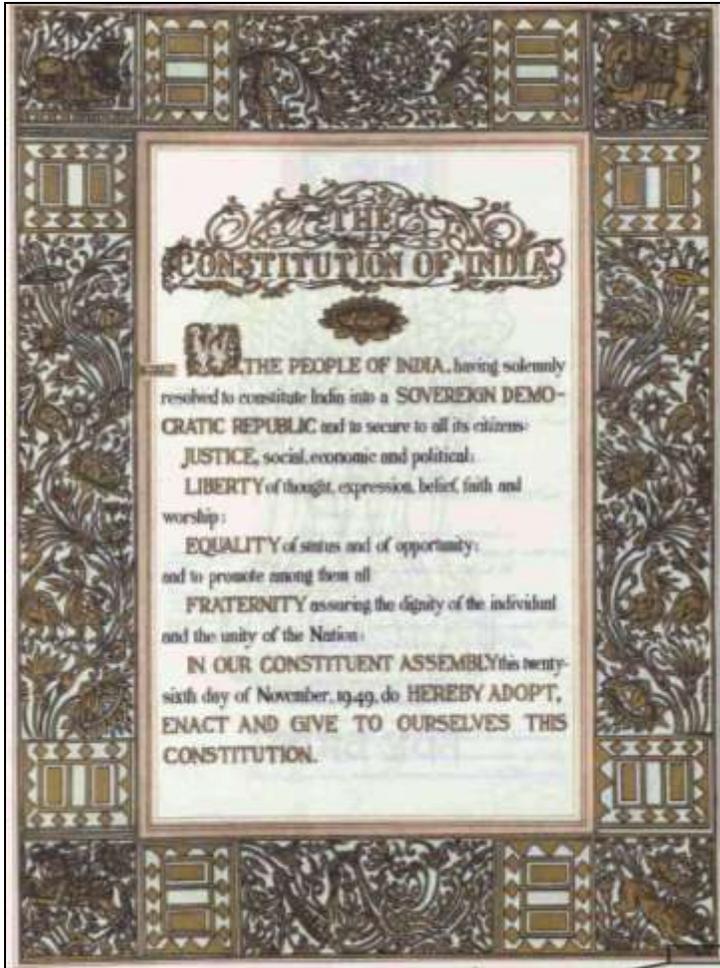
Nowadays...we celebrate Diwali in Mall only..nobody comes HOME to greet us..



Nation

November 26 – Commemoration as Constitution Day

On November 26th, 1949, the Constitution of India was first adopted (though only partially) when 284 members of the Constituent Assembly signed the Constitution, after two years, 11 months and 17 days of preparation. (The full adoption was on January 26, 1950, which is annually celebrated as the Republic Day of India.)



Dr B.R.Ambedkar was the Chairman of the Drafting Committee of the Constituent Assembly. Dr Rajendra Prasad, who later became the first President of India, was the Chairman of the Constituent Assembly.

In 1979, a resolution was passed to celebrate the anniversary of the adoption of the Constitution and mark it as the National Law Day. In 2015, after the Hon'ble Prime Minister's announcement to the effect, in commemoration of the 125th anniversary of Dr Ambedkar, the day is celebrated as Constitution Day.

The Constitution of India is the foundation on which the country stands and runs. It lays down the framework, defining fundamental political principles, the structure, procedures, powers and duties of government institutions, and sets out fundamental rights, principles and duties of citizens. It consists of the Preamble, Articles and Amendments, and the major

Principles of Government. The Constitution of India is the world's longest for a sovereign nation, with 448 Articles in 25 Parts and 12 Schedules.

Article 32 of the Constitution, which is about the right to constitutional remedies, was recognised by Dr Ambedkar as "the heart and soul of the Constitution". Article 32 provides the right to Constitutional remedies – which means a person has a right to move the Supreme Court and the high courts for ensuring the protection of his fundamental rights.

by Susan Koshy, Editor-in-Chief



Sports

Magnificent Mary Flies High, Making India Proud



On November 24th, 2018, Chungneijang Mary Kom Hmangte, popularly known as Mary Kom, nicknamed Magnificent Mary, and mother of three from the North Eastern state of Manipur, created world history, becoming the first woman in the world to win six world championships. She is also the only woman boxer to have won a medal in each one of the seven world championships.

Growing up in a poor home as the eldest of three siblings did not deter her parents from sending her to school where she discovered her interest in sports and later on, in boxing specifically. She became the state level champion before taking a break for her marriage. She returned to training for boxing after two children, and then there was no looking back.

Mary Kom went on to win medals including gold, at the Asian, Commonwealth and Olympic Games and the World Championships. She is the recipient of the third highest civilian award of India, the Padma Bhushan. She is currently a Member of the Rajya Sabha.

In 2014, a Bollywood film named 'Mary Kom' was made about her journey to becoming a world boxing champion.

PreSense congratulates Mary Kom and wishes her higher levels of achievement in future.

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