



## News & Views

### Seismic tomography aids Bangalore metro construction

Unpredictable rock formations and small boulders caused major delays during the tunnel construction for Bangalore Metro Phase 1. This led engineers of Bangalore Metro Rail Corporation (BMRC) to seek the help of the National Institute of Rock Mechanics (NIRM).

By using their advanced seismic tomography technology, the NIRM can provide precise information on the location and size of boulders. This could help in mapping underground rock formations for Phase 2 of the metro project.

BMRC officials said while huge boulders pose a challenge in tunnelling work, TBMs can still cut through them. Smaller boulders however of 3m to 5m in diameter start rotating along with the blades of the TBM cutterhead. This is what caused damage to the cutterhead of TBM in April 2014, stalling tunnelling works for over a year.

P.C. Jha, head of the Department of Geophysics at NIRM, said BMRC contractors used borehole logs to assess the underground surface, which proved insufficient in mapping the boulders. "This seismic refraction study, carried out from the surface, can tell the type of the rock and its location within a 20m reach," he said.

"However, if a free surface is not available along the alignment, NIRM's seismic tomography survey - which is executed from the boreholes - can provide a full projection of boulder sizes. Though it is four to five times costlier than a surface survey, this is negligible considering the cost of potential delays."

*Source: Deccan Herald, 21.2.19*  
<https://www.tunneltalk.com>

### MMRC awarded contract for Pune metro

The Maharashtra Metro Rail Corporation (MMRC) has awarded a contract for the construction of a 5km underground section of Pune Metro. Under the \$2.8 billion contract a joint venture comprising of Tata and Turkish company Gulermak will construct two 2.5km-long tunnels.

The underground section is one of the most challenging parts of the 16.56km PCMC-Swargate Pune Metro rail line or Corridor-I, as it passes through densely populated parts of Kasba Peth, Budhwar Peth and Mandai market in the old city district of Pune.

The Maharashtra Metro Rail Corporation also has invited bids for the design and construction of underground stations at Shivajinagar and Civil Court. Furthermore tunnels need to be constructed between Agriculture College and Northern End on the North-South Corridor of the metro system. Larsen & Toubro, AFCONS Infrastructure, J. Kumar Infraprojects and Shanghai Tunnel Engineering participated in this tender.

*Source: Urban Transport News, 25.2.19*  
<https://www.tunneltalk.com>

## **Lucknow metro corridor completed**

Lucknow Metro Rail Corporation completed the 23km-long Phase 1A of the city's metro system. Passenger services were scheduled to start the following day.

Phase 1A will increase the accessibility to Chaudhary Charan Singh International Airport and helps commuters to evade the congested roads of Lucknow. It includes a 3.4km underground section with three stations, which has been constructed by a joint venture comprising of Tata Projects and Gulermak. The line opened a year ahead of schedule. It is intended to be the first of a network which is being planned with the aim of increasing public transport use from 10% to 27% of the city's population of 3 million people, reducing traffic, cutting journey times and helping to lower emissions.

The European Investment Bank (EIB) provided a €450 million long-term loan to support the project. "Opening a year ahead of schedule, the Lucknow Metro is a success story," said EIB Vice-President Andrew McDowell. "The project is one of the largest commitments of the EIB in India and the most significant support for sustainable transport outside Europe. The first metro line in Lucknow is a flagship project, also for the EIB. It marks a new era in our engagement in the country."

*Source: The Economic Times, 8.3.19  
<https://www.tunneltalk.com>*

## **Mumbai-Ahmedabad bullet train project in progress**

The Mumbai-Ahmedabad bullet train project is progressing at a rapid pace. In a recent development, the National High Speed Rail Corridor Ltd (NHSRCL) has called a tender for the country's first undersea tunnel, connecting Mumbai underground station at Bandra-Kurla Complex with Shilphata in Maharashtra.

The tender was called by NHSRCL on April 22 and would involve the construction and related civil works for a 20.4km-long tunnel. "The project is likely to be completed within 3.5 years after the contract has been awarded," said a NHSRCL spokesperson.

Once completed, the undersea tunnel would form an important link to connect with Mumbai. Japan is aiding India with the development of the high speed rail corridor and providing technological assistance.

The entire project, including the construction of 12 stations, is scheduled for completion by August 2022. Bullet trains would then travel at speeds exceeding 300km/h between Mumbai and Ahmedabad.

*Source: The Week, 23.4.19  
<https://www.tunneltalk.com>*

## **Chennai airport to expand underground**

Chennai International Airport, India, has appointed Singapore-based Meinhardt as a consultant to examine a proposal for the construction of two tunnels inside the airport.

The tunnels will connect the satellite terminal located near the remote bays with an integrated terminal that is currently being constructed. One tunnel will be used for transporting passengers while the other will be used to move baggage from the integrated terminal to the satellite terminal.

The new integrated terminal is being built as a part of the airport's second phase of modernisation work. "Soon after the consultant finishes the feasibility study, a new contractor will be appointed for building the tunnel and the satellite terminal," an airport official said. "It will be quite a challenge to build it in a fully functional airport, but we can take it up in parts and finish the construction. For a start, the consultant will first do soil tests to identify the right location for the tunnel."

The new tunnel and satellite terminal are expected to reduce the impact of growing traffic at the existing terminals. Congestion at the new integrated terminal is expected to be eased by the satellite terminal before it reaches its capacity.

*Source: <https://www.tunneltalk.com>; 28.5.19*

### **Ircon International to bid for Himalayan road link**

Indian contractor Ircon International will bid for the 14.2km Zojila road tunnel project, according to top officials of the company. The state government of Jammu and Kashmir has invited fresh bids for the project after the exit of development company IL&FS Transportation Networks.

The road tunnel will run under Zojila pass in the Himalayas between Sonamarg and Dras in Jammu and Kashmir. The tunnel will ensure year-long road connectivity between Srinagar and Leh which currently remains closed for about seven months every year due to heavy snowfall.

Optimistic about being awarded the challenging project, Director Sunil Kumar Chaudhary said: "We are the only player (bidder) that has made a 12km-long tunnel in the Himalayas."

Asked about the preparation that Ircon International will have to undertake for the project in the Himalayan region, Chaudhary said: "Generally, when we plan camps for workers of such projects, we ensure they are centrally heated. Here the temperature drops up to -40 degrees Celsius. We are planning to have our own helicopter for emergencies."

Implementing such a project will require huge investments, Chaudhary added. Construction work is possible for only six months per year.

*Source: The Hindu Business Line, 30.5.19  
<https://www.tunneltalk.com>*

### **Mumbai metro line 3 passes halfway mark**

After 19 months of tunnelling works Mumbai Metro Rail Corporation (MMRC) has constructed 28km of the 56km twin bored tunnels of the 33.5km metro line 3.

The first TBM was launched at Naya Nagar in September 2017, and at present, 17 TBMs are working across the alignment. According to officials, around 80% of tunnelling will be completed by March 2020.

Tunnelling work started in November 2017. Over the past nine months 13 breakthroughs have been achieved and 19 more are to be expected. The first breakthrough was accomplished at Mumbai airport in September 2018.

*Source: The Hindu, 12.6.19*  
<https://www.tunneltalk.com>

## **Bangalore metro ready for Phase II**

As many as nine TBMs will be deployed to build the 14km-long tunnels from Dairy Circle to Nagawara by Bangalore Metro Rail Corporation (BMRCL). The underground stretch is part of Bangalore Metro's Phase-II Gottigere–Nagawara line.

The BMRCL has set 2023 as the target to complete the construction work of Phase-II, which includes the construction of 12 underground stations. Preliminary works for one of the sections have already been completed. The BMRCL is in the process of finalising a tender for two other packages.

Of the nine TBMs, four would start their journey likely within three months. In Phase-I, six TBMs had been deployed to excavate 8.8km of tunnels. The tunnelling works of Phase-I were delayed for years due to various reasons such as hard rock and TBM break downs. It took the BMRCL over five years to complete Phase-I.

*Source: The Hindu, 17.6.19*  
<https://www.tunneltalk.com>

## **India's longest electrified rail link opens**

Indian Railways has successfully delivered the country's longest electrified rail tunnel.

The 6.6km long tunnel is situated between Cherlopalli and Rapuru railway stations and is part of the new Obulavaripalli-Venkatachalam railway line. On 25 June two freight trains successfully ran between the two stations, marking the full-scale operation of the newly built line.

The tunnel has been completed in what local news media call "a record time" of 43 months. The New Australian Tunneling Method has been used to construct the 6.5m high tunnel at a cost of \$124,3 million.

The newly electrified line reduces the distance between Krishnapatnam Port and its hinterland areas by 60km. Travelling time for freight trains between Krishnapatnam Port and Obulavaripalli is halved from 10 to 5 hours. The tunnel therefore enables significant economic growth in the area.

*Source: Financial Express, 9.7.19*  
<https://www.tunneltalk.com>

## **Saudi Arab's participation in the Indian strategic crude oil reserves**

India is seeking investment from Saudi Arabia to build emergency crude reserves that will act as a buffer against volatility in oil prices and supply disruptions for the third-largest oil consumer.

Saudi's participation in the Indian Strategic Petroleum Reserve program was discussed at a meeting between the kingdom's energy minister Khalid Al-Falih and his Indian counterpart Dharmendra

Pradhan in New Delhi, according to a government statement. They also discussed expediting a proposed \$44 billion oil refinery project on India's west coast with investment from Saudi Arabian National Oil Co., it said.

India is expanding its strategic reserves to shield from perennial political risk in the Middle East and Africa that account for the bulk of its purchases. Prime Minister Narendra Modi has opened some of the underground caverns for commercial storage to lessen the strain on state finances.

It has already leased out tanks to Abu Dhabi National Oil Co. India has already built 5.33 million tons of underground reserves in three locations, which can meet 9.5 days of the country's oil needs.

It now plans two new reserves with a combined capacity of 6.5 million tons, sufficient to cover an additional 12 days.

*Source: Hindustan Times, 11.03.2019*

### **World's largest lift irrigation project in Southern Indian state Telangana!**

In June 2019, pumping stations began lifting river water toward parched land in southern India in what is said to be the world's largest lift irrigation project.

Some of the 19 pumping stations on the Godavari River lifted water to a height of 618 meters (2,020 feet) to irrigate about 4 million acres (1.6 million hectares) in Telangana state, instead of allowing the flood waters to flow to the sea. At its inauguration, the top elected official in Telangana state, Kalvakuntla Chandrasekhar Rao, said the project is the world's largest using lift irrigation. Experts say the Colorado River in the United States and the "Great Man-Made River" in Libya previously had the world's largest lift irrigation projects.

The Indian project comprises 20 reservoirs with canals running up to 1,530 kilometers (955 miles) and underground tunnels stretching to 200 kilometers (125 miles). "This project will be a game changer and bring prosperity to the entire state," Rao said. Thunga Lakshminarayana, an independent expert who writes on irrigation and power issues, said water from the Godavari River had been going to waste by flowing into the sea.

*Source: Hindustan Times, 22.06.2019*

### **700m-long tunnel at landslide-prone zone in lower Himalaya**

The public works department (PWD) has decided to construct a road via a 700 meter-long tunnel to find a permanent solution to landslides at Dharasu region on Yamunotri highway stretch of the all-weather road.

Dharasu belt is a high landslide-prone area and constructing a normal road would not be safe for commuters taking that stretch as it has high chances of being blocked for most part of the year.

Officials from the public works department and the union road transport and highways ministry met a few times in February and March 2019 to discuss a viable option of road construction for the area, before deciding on construction of the tunnel.

Hari Om Sharma, chief engineer in-charge for national highways in the PWD said, "Dharasu and its nearby areas are very active in terms of landslides and it cannot be treated, which is why the

PWD in consultation with the central ministry decided to construct the road through a 700-meter-long tunnel.”

Sharma said at present officials at the department were working on a detailed project report which should get approved within two months after which on-ground work will start. Speaking about whether the same would be done for other landslide-prone patches, he said, “Constructing a tunnel is not cost efficient, but this stretch was an area where even the latest technologies would not have helped in treating the landslide prone zones and it would have been a constant threat to those using the road.”

The construction cost for this 700m-long tunnel would approximately amount to something between ₹1200-1300 million.

*Source: Hindustan Times, 17.04.2019*

### **India needs more ‘Premjis’**

Azim Premji’s decision to give away more of his wealth – he has now given away \$21 billion to his foundation, making it the largest in Asia and the fifth largest in the world – has once again brought the focus on Philanthrocapitalism (yes that’s a real word). One of the biggest supporters of Philanthrocapitalism is the man who wrote the seminal book on the concept, Mathew Bishop. He sees the super rich as so-called “hyper agents” who have what it takes to do “essential things better than anyone else”. The best example of the concept is the work of the Bill and Melinda Gate Foundation. Gates and his friend, legendary investor, Warren Buffet, are also the inventors of the Giving Pledge, where the super wealthy promise to give away at least half their wealth. There are currently around 190 billionaires who have promised to give away roughly \$360 billion. Among the Indians who have signed the pledge are Azim Premji, Rohini and Nandan Nilekani and Kiran Mazumdar Shaw.

Supporters of the concept believe that philanthropy can solve the world’s biggest problems. There are opponents as well. One such is Linsey McGoey, a Canadian sociologist who believes that foundations that give a lot aren’t always accountable and that they sometimes work towards reinforcing the same existing inequalities they set out to remove. The truth, as it usually does, probably lies in the middle, although in a country such as India, it doesn’t make sense to question any sort of giving. (It is essential to win hearts of people.)

Back when CK Prahalad’s theory of core competence was all the vogue, Tarun Khanna and Krishna Palepu argued that diversification was actually a smart strategy in emerging markets where there were institutional and infrastructural gaps. That’s perhaps the same reason why Philanthrocapitalism is a good idea in India – there are far too many problems for the State to address, not just in terms of resources, but also attention and expertise. India needs more people like Mr Premji.

*Source: Hindustan Times, 18.03.2019*

### **India to grow at 7.5% in next 3 years: World Bank**

India is projected to grow at 7.5% in the next three years supported by robust investment and private consumption, the World Bank has said.

World Bank in its Global Economic Prospects released said that India is estimated to have grown 7.2% in FY19, which ended March 31, 2019. A slowdown in government consumption was offset

by solid investment, which benefitted from public infrastructure spending. As against a growth rate of 6.6% in 2018, China's growth rate in 2019 is projected to be dropped to 6.2% and then subsequently to 6.1% in 2020 and 6% in 2021, the bank said. With this India will continue to retain the position of being the fastest growing emerging economy. And by 2021, its growth rate is projected to be 1.5% more than China's 6 per cent.

According to the World Bank, growth in India is projected at 7.5% in FY20 (April 1, 2019 to March 31, 2020), unchanged from the previous forecast, and to stay at this pace through the next two fiscal years.

“Private consumption and investment will benefit from strengthening credit growth amid more accommodative monetary policy, with inflation having fallen below the Reserve Bank of India's target,” it said.

Support from delays in planned fiscal consolidation at the central level should partially offset the effects of political uncertainty around elections in FY19, it said.

The World Bank said that India's urban consumption was supported by a pickup in credit growth, whereas rural consumption was hindered by soft agricultural prices.

On the production side, robust growth was broad-based, with a slight moderation in services and agricultural activity accompanied by acceleration in the industrial sector. Weakening agricultural production reflected subdued harvest in major crops on the back of less rainfall, it said.

Services activity softened mainly due to slowing trade, hotel, transport, and communication activity. The industrial sector benefited from strong manufacturing and construction with solid demand for capital goods. The slowing momentum in economic activity in late 2018 carried into the first quarter of 2019, as suggested by softening services and manufacturing Purchasing Managers' Indexes, the report said.

Observing that the new Goods and Services Tax regime is still in the process of being fully established, creating some uncertainty about the projections of government revenues, the report said fiscal deficits continue to exceed official targets in some countries – India, Pakistan.

*Source: Hindustan Times, 06.06.2019*

## **Government to construct 44 'strategic' roads**

The government will construct 44 strategic roads along the border with China and over 2100km of axial and lateral roads in Punjab and Rajasthan, abutting Pakistan a CPWD document shows.

According to an annual report (2018-19) prepared, and released earlier this month by the Central Public Works Department(CPWD), the agency has been asked to construct 44 “strategically important” roads along the India-China border to ensure quick mobilization of troops in case of a conflict.

The nearly 4000km-long Line of Actual Control between India and China touches areas from Jammu and Kashmir (J&K) to Arunachal Pradesh. The report comes at a time China is giving a priority to projects along its India borders. In 2017, Indian and Chinese troops engaged in a face-off at the Doklam tri-junction after the neighbouring country had begun building road in the area. The

standoff ended on August 28 following a mutual agreement under which China stopped the construction of the road and India withdrew its troops.

The report stated that these 44 strategically important roads along the India-China border will be constructed at a cost of nearly ₹210 billion.

“The CPWD has been entrusted with construction of 44 strategically important roads along the Indo-China Border spanning 5 states of J&K, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh,” the report stated.

“The total Cost of work as per DPRs (Detailed Project Reports) is ₹21 0.40 billion (approx),” the report stated. It said the process of approval of DPRs by the Cabinet Committee on Security (CCS), headed by Prime Minister Narendra Modi is underway.

The DPRs for this project are under preparation in CPWD, which is a major construction agency of the central government.

“A total of 945km of lateral roads and 533km of axial roads lie in Rajasthan (tentative cost ₹3 7 billion) and 482km of lateral roads and 219km of axial roads in Punjab (tentative cost Rs 17.50 billion),” it stated.

The road projects will secure the vast and remote border areas of Rajasthan and Punjab, it stated.

India’s border with Pakistan runs through four states, Jammu and Kashmir (1,225km, which includes 740km of Line of Control), Rajasthan (1,037km), Punjab (553km) and Gujarat (508km).

*Source: Hindustan Times, 14.01.2019*

## **India pushes to complete infra projects on China border by 2022**

India has sharpened its focus on scaling up infrastructure along the China border and set a target of three years to complete all strategic road projects along its northern frontiers, a top general said ahead of Prime Minister Narendra Modi travels to Arunachal Pradesh to lay the foundation of a tunnel at the Sela Pass.

The tunnel forms part of a strategic road project that will reduce travel time to Tawang, a sector where the Indian Army is heavily deployed. The PM will lay the foundation on February 9, 2019.

Border Roads Organisation (BRO) chief Lieutenant General Harpal Singh said on Wednesday that it will complete by December 2022 all 61 strategic roads assigned to it along the country’s northern border with China, spread across Arunachal Pradesh, Jammu & Kashmir, Sikkim, Uttarakhand and Himachal Pradesh.

These roads add up to a total length of 3,417km, of which 2,350km has been completed.

“We have redeployed our task forces and moved the bulk of them from the hinterland to the northern borders to construct strategic roads within three year. Of BRO’s 32,000-strong workforce, 67% is now deployed along the Chinese border,” Singh said.

The Sela Pass tunnel, announced by the government in the 2018 Budget, is part of the Balipara-Charduar-Tawang road, one of the strategic projects along the Chinese border.



The tunnel will cut down travel time to Tawang by at least two hours, improving border connectivity for the army.

Of the 61 roads assigned to it, BRO, which has finished work on 34, has been questioned by parliamentary panels over delays. “It is unfair to calculate progress by taking into account the number of roads completed. The length of the roads completed is the industry standard of measuring progress. We have completed almost 70% of the road length,” Singh said.

“If you also count tracks (distinct from black-top roads) that facilitate vehicular movement, we have covered 98% of the road length,” he said. Some key roads likely to be completed soon include a 35km stretch road that will improve connectivity to Doklam, where Indian and Chinese soldiers were locked in a tense 73-day standoff in 2017. Singh said this road would be completed by March 2019.

The Darbuk-Shyok-Daulat Beg Oldie road in Laddakh is expected to be completed by next year, he said. This road measures 250km.

Singh said India is aiming to match infrastructure on the Chinese side of the border by 2024-25. “Projects are being monitored by the highest levels of the government. We are on course to be on a par with China on the infrastructure front,” he added.

Apart from the 61 roads being built by BRO, the Central Public Works Department (CPWD) is currently engaged in the construction of 12 strategic roads along the Chinese border. The 73 roads measure a total of 4,643km.

The government is also set to clear the construction of 44 more “strategically important roads” along the India-China Border in Arunachal Pradesh, Sikkim, Jammu and Kashmir, Uttarakhand and Himachal Pradesh, according to the CPWD’s annual report for 2018-19. Building these roads is expected to cost around ₹210.40 billion, the report says.

The detailed project reports for these roads, aimed at swifter mobilization of troops, are before the Cabinet Committee on Security for approval. The construction work is expected to be split between BRO and CPWD.

“Infrastructure development along the northern borders is improving. Renewed efforts are being made to complete projects on time. Things have been delayed but are gathering pace now,” said Lieutenant General SL Narasimhan (retd), who commanded a corps in the North-east and is currently a member of the National Security Advisory Board.

*Source: Hindustan Times, 08.02.2019*

## **Cultivate a community of innovators**

Health innovations – from vaccinations to bed nets – have been instrumental in fighting some of world’s most persistent and deadly diseases. Now more than ever, countries around the world are investing in innovation to ensure that more people can lead healthy, productive lives. It’s exciting to see this trend in action in India, which is emerging as a leader in developing tools that improve health care.

India introduced the first domestically developed rotavirus vaccine, Rotavac, to curb infant mortality from diarrhea. The vaccine has the potential to prevent approximately 27,000 deaths and

300,000 hospitalizations in India each year, and it could also play a key role in addressing global supply issues that have placed millions of children at risk. Online logistic management systems such as the Electronic Vaccine Intelligence Network (eVIN) are helping to ensure real time information on vaccine stock and cold chain management so that lifesaving vaccine reaches the people who need them the most.

By 2030, the government aims to place India among the top three countries globally in science and technology. Investing to realize this vision, the Union Budget increased its allocation in these areas by 7.5% in 2018-19 to ₹65 7.410 billion. We applaud these investments, which have enormous potential to improve lives in India and abroad, and to strengthen the Indian economy in the process.

One initiative that speaks to the promise of national innovation is Grand Challenges India. With a fundamental belief that great ideas can, and do, come from everywhere, Grand Challenges supports the world's brightest minds in tackling big problems in health and development. Launched in 2003, its network now includes national-level programmes in more than a dozen countries that have collectively awarded more than \$1 billion to innovators from 87 nations.

To support and cultivate India's vibrant community of innovators, in 2012, the Bill & Melinda Gates Foundation partnered with the Biotechnology Industry Research Assistance Council (BIRAC) and Department of Biotechnology (DBT) to launch a national Grand Challenges programme. The aim was to identify and fund the development of bold new ideas and technologies to address human and animal health, food, nutritional and development problems.

Over the last six years, the programme has launched seven challenges, received over 2,000 scientific applications and supported 18 projects. We'll share a few exciting examples.

The first is an initiative to inspire better toilets. India's Reinvent the Toilet challenge asked scientist to come up with sustainable solution for improved sanitation. Researchers from the Kerala-based company, ERAM Scientific, were among the many who stepped up. They developed India's first public electronic toilet, 900 of which have now been installed in schools across the country.

Another is 99 DOTS, which is helping India reach its ambitious target of being tuberculosis free by 2025. While the disease is curable, treatment is complicated and causes poor adherence to drug regimens. Everwell Health Solutions, based in Bangalore, created 99 DOTS to help patients stay on track at a fraction of the cost of other monitoring tools. The system has reached over 80,000 patients and the team is working with the government to expand even further.

Grand Challenges India also tackles connected issues like food security, nutrition and agriculture. Achieving Healthy Growth through Agriculture & Nutrition (AgNu) funds Indian-led pilot projects that aim to reduce low birth weight, early stunting and wasting among Indian infants. Supported by this programme, researchers from Society for Science developed a solar-conduction food-dryer to promote year-round diet diversity, which has been successfully used by 250 women farmers. Plans are now in place for an international scale up involving 1,200 farmer cooperatives in eight countries.

Grand Challenges India recently joined forces with similar initiatives in Brazil and Africa to address antimicrobial resistance. The programme has also partnered with several Indian government agencies to launch its fourth call to reach more people with lifesaving immunizations through better data.

Innovation requires time and patience, but with partnerships and commitment, the future looks bright. Grand Challenges India is fostering innovations that will help people in India and around the world lead better lives. Innovation has enormous potential for India's future, and the Bill & Melinda Gates Foundation is excited to continue supporting the Indian government and innovation community on the path from idea to impact.

*Source: Hindustan Times, 07.02.2019*

## **Auto-suggestion for the creative confidence**

*"Inspire hope." - Chanakya*

The creative confidence is the need of time. The auto-suggestions are likely to empower some people. We together are capable of designing our fates. Encourage yourself. Auto-suggestion to yourself starts with the silent repetition of "I am ..... By mercy of God". Fear attracts fears. The fear and inferiority complexes of the scientist and engineers need to be weeded out by their teachers. Heal your egos. Weed out the unwanted thoughts. We must learn the risk management. All knowledge is useless without the risk management. The out-door sports will give us the greatest leaders in the world at an accelerating rate to manage the risks. So brave nations are really lucky nations. Our conscience is the cause of good luck. Sporting nations are at top. Non-sporting nations are flop. Out-door sports create the leadership abilities among sport persons. We need to increase our will-power or the collective will-power. The workers are definitely stronger than the devotees. Useful knowledge is all powerful.

Auto-suggestion works very slowly. There is great power in silent repetition of auto-suggestion, in full faith. Bless yourself. "I am successful by mercy of God". "I am that peaceful being or I am that blissful being". This is the answer of question who am I? Happiness is deeper within us and just beyond God consciousness. Who is mine? Blissful cosmic healer is mine. "I am happy being". "I am inspirer". Use "I am" before every auto-suggestion. "I am child of God". "I am great by mercy of God". Those who are connected to blissful God will continue to smile, laugh or dance and sing even in adverse circumstances. If panic attacks, please start repeating your favorite auto-suggestion. Courage is beyond bliss of mind. Inner happiness is beyond the knowledge. God is creator of happiness: Truth, love, peace and trust will bloom automatically one day. Everyone is unique.

If you assume that you are powerful, you will become powerful. Such is the power of positive thinking. Positive thought and noble deeds are the cause of good luck eventually. This is called the law of attraction. Positive thoughts attract the positive thoughts. Negative thoughts attract the negative thoughts. The positive thought has healing power. The pure thought has purifying power. The great persons think that they are great persons. Adore great persons when you meet them. Believe is the power of belief. The faith moves mountains. Luck is also a truth of life. Please wait for your lucky time, to be successful. Positive thinking is 100 times more powerful than negative thinking or doubts or fear. Top scientist and engineers should be our heroes. Come out of circle of doubts and trust all others. Money comes when fame comes.

Be in equilibrium. Life is priceless. Inspire the honest persons. Humour reduces our stresses. We are all unique persons. There will never be duplicate of anyone forever. All nations are unique. Let us be optimistic. The whole universe is proved to be human-centre for us to evolve and be happy. There is out-of-world happiness. Happiness attracts happiness. Mother Nature responds positively and slowly to our repeated auto-suggestion with full faith. Protected Mother Nature is very beautiful, self-regenerating, secretly super creative, self-healing and helping the people to evolve forever. So let us protect Mother Nature. Auto-suggestion helps us in the crisis management in life.

The repeated prayers in full faith change unfavourable circumstances into the favourable circumstances. Auto-suggestion is utilization of thoughts power and faith power. So there must be the dynamic law of evolution of orderliness in the nature. Be original. Be courageous. Belief is a powerful thought which becomes a fact soon automatically in many cases. Medical global business is likely to touch 100 trillion dollar by 2050.

Please heal your thought and the healed thoughts will then heal the sick bodies automatically. Your noble thoughts or auto-suggestion will make your life really great. Repetition of auto-suggestion will make you slowly fearless. If you want to be happy for whole life, please love your work. Increase your line. Do not cut lines of others as they will cut each other themselves.

Auto-suggestion will increase your will-power slowly. May God make rich persons to be kind persons! Inner joy will revolutionize the whole world. Contentment is happiness. Blooming of all the lives is the law of the nature. Then radiate happiness. Mother Nature is creator of the love. Bliss of God is the food of our souls. Bliss improves our relationships.

Noble character development is the ultimate goal of life, even for the enlightened persons. Win hearts. In fact moral science is actually an experimental science and not a theoretical science, like all other science. We must reduce the difference between saying and doing. God must be having plan for development of character of the people.

Secrecy is the cause of success due to minimization of resistance. It is good that Indian Army-in-chief uphold the dignity of character. Originality clicks; originality wins and originality appeals. Self-regulation is the best culture. There should be aim in life. Aimless life is unstable life. So let us reduce cruelty.

Darwin is right. We do not have choice but to become a strong nation. May God give us intelligence and courage. God is more merciful on the scientist and engineers than priest. Service is the best method of healthy life. Competition will reform all the political parties. Competition will bring out the best in us. The cheerfulness is ever-evolving. The cheerfulness will differ in fighting between scientist and priest. The cheerfulness will diffuse infighting among various religions society. God is far more blissful than all the scriptures. Children emit the joy waves. One should enjoy one's own bliss centre, deeper within us always. This truth has not changed with time. We should bloom like the lotus flowers in the muddy waters. Blissful thoughts make people look beautiful for a long time. Everyone should find bliss centre deeper within oneself every day by meditation at heart.

There are a few heavens on the earth, both nature-made and people-inspired heavens. Visit these heavens for peace. Settle according to your liking. The people will be the future rulers of their governments. The government will be servant of the people. The united people are real God. Inner joy will unite us all. Inner joy will revolutionize the whole world. Our inner happiness will ultimately win over unhappiness all over the world. The brave nations are lucky nations. India should create a good image of herself to earn money. India should attract the capital investment from all over the world.

A business of about US\$19 trillions is expected in AI (artificial intelligence) all over the world by 2030. India can take lead in AI. India has cycle of 30 years precisely. Next peak of India will be in 2037; and 2067 when India will regain its princetive glory. It is destiny of India. God has a plan for Himalaya. The entire mesmerizing and most beautiful Himalaya will get developed as one of the best tourist spot of the world, as if the nature is an Architect. India is the only country which had been developing the noble character of the whole world for ancient times. India can become a great

nation if India listens to its conscience. The nature follows automatically our logical ideas most of the times in the long time. Our scientists and engineers are no less than other scientists and engineers. Crisis is an opportunity to make money. The original and useful inventions create new business and destroy the old and established business. Money is in service of the rich nations.

The estimated business of adoption of the new electric cars and chargers is about US\$6 trillions globally. India should go ahead in this green business. Money is in hill development in India. The kind innovative and brave nations have become rich nations due to good-will of the people. Win hearts of the people. Fate of India is very good now onward. Globalization, privatization and liberalization will be the motivating forces. India will become the military power in the future. Only a well-protected nation can be rich. Weak nations attract criminals and mafias. It is better to capture markets than to capture government, to earn big money.

In the solitude, our peaceful minds act as antennas to receive the reliable, brilliant and original ideas, from cosmic super-mind of God perhaps. Mother Nature is the best slow teacher of all the subjects and arts. Those who love do not preach, they serve others like our mothers. Fair, healthy and creative competition will slowly transform India. The creative-intuitive intelligence creates all kinds of wealth and fame. People cannot be successful in becoming rich themselves. A strong leader can be successful in making a nation rich, due to his organizing power of the people. Highly organized societies are happy, rich, healthy and powerful forever. It is good to earn money but let us use money wisely. If you have made a mistake in identifying the character of a person, the result may be death. Trust your close-friends only. There is need for the international infrastructures for fast global trade of the order of US\$ 10 trillion. The underground infrastructures and underground markets etc are safe against all the natural disasters and wars. Underground cities are needed to reduce the panic of people due to global warming, natural disasters and wars etc.

Herbal ecosystem is needed globally for good health and removal of poverty of people. Ecologically-sound-technological development is sustainable as the bio-entropy is always negative. Herbal medicines will cure the side effects of chemicals. The health should be our first priority. Wealth should be our next priority. UNO can bring world peace by giving the auto-suggestion to themselves that "All people of the world are growing peace-loving and pious", but at a fixed hour on every day with full faith. The collective auto-suggestion is better than the individual auto-suggestion. The world peace will come if we respect each other. Peace and political stability in a region are essential for the economic prosperity of any nation. Management rating should be improved to increase significantly the productivity of workers. Most of the problems are created by talking. The silence is the natural solution. The nature never talks. Inner joy is beyond the laws of the nature. The religious leaders should not mute minds of terrorists. You will lose your originality if you read too much or listen too much. Your own bliss centre will liberate you. Suggest to yourself "I am surrounded by happiness on all sides". "I am free of unhealthy habits by Mercy of God". Positive thinking will win over negative thinking eventually.

The object of science, technology, arts and all religions is to serve the people. Enjoy the blissful company of blissful God. Invisible Blissful God had always been punishing the excessively cruel leaders and their organization. Miracles are there but they are rare. Hence there is no extremism in the nature. Out-door culture will change the whole world. Out-door adventurous sports will yield the future crisis-management leaders. Creative confidence is need of the time. But unmarried leaders are doing better due to their total commitments. Isolation is not possible between the truth and character. Isolation is not possible anywhere in the universe as well as in our consciousness. Fair, healthy and creative competition will transform the spiritual societies. Lack of physical activities is the cause of all problems. Exercises are essential to create happiness chemicals. Use it or lose it. If you do not exercise, you lose your body strength. Lack of exercise is the cause of

unhappiness among rich persons due to the lack of happiness chemicals (endorphins). Compassionate capitalism is working very well in India and is motivating creativity in India. Quality is more profitable than quantity. Meritocracy works better than democracy. Every nation must have the long-term vision for sustainable technological development for sustainable economic growth. The economic growth is directly proportional to development of energy. No business contract should be a license for injustice. Only the money will save you in crises. The drug and alcohol free people can be rich. Fast justice is essential for a nation to become rich. The right celebrities should be chosen to mesmerize masses to buy highly useful products. Faith is the basis of a big business. So many states have become rich due to the honesty. PPP (public-private partnership) is essential to realize the dreams of governments.

**- Prof. Bhawani Singh**  
*Chairman, Editorial Board, JRMTT*  
*(From Inspirations of Yogis of India)*