



## Forthcoming activities

### India International Science Festival



डॉ. मेघेन्द्र शर्मा  
सचिव

विज्ञान भारती स्वदेशी विज्ञान आन्दोलन के रूप में एक नॉन प्रॉफिट स्वयंसेवी संगठन है जिसकी स्थापना सन 1991 में प्रो. के. आई. वासु ने की थी। आज विज्ञान भारती न केवल भारत में बल्कि अन्य देशों में भी भारतीय वैज्ञानिक परम्परा को आधुनिक विज्ञान के साथ समिश्र करते हुए वैदिक विज्ञान की तार्किकता एवं प्रमाणिकता को विश्व पटल पर वैज्ञानिक बिरादरी में मंथन का प्रयास कर रही है।

विज्ञान भारती देश में सामाजिक व संस्कृतिक उत्थान व आत्मनिर्भर भारत के लिए लगभग हर क्षेत्र में कार्य कर रही है। इसमें किसान, शिक्षाविद, उद्योगपति, वैज्ञानिक, छात्र आदि शामिल हैं। सरकार द्वारा लागू नीतियों एवं पखिनाओं के बारे में जागरूकता पैदा की जाती है। उदाहरण के लिए राष्ट्रीय शिक्षा नीति 2020, कृषि में नवाचार, विज्ञान, प्रौद्योगिकी, नवाचार नीति 2020 के बारे में विस्तृत चर्चाएं की गई हैं। इससे देश के ढांचागत विकास में मदद मिलेगी।

इस "ई-न्यूजलैटर" के माध्यम से हम विज्ञान व प्रौद्योगिकी में नवीनतम जानकारियों के साथ भारतीय वैज्ञानिकों के विश्वपटल पर दिये योगदान को भी बतसाया गया है। विज्ञान भारती राजस्थान द्वारा विगत महीनों में किये गये कार्यों तथा भविष्य की योजनाओं के बारे में संक्षिप्त जानकारी दी जा रही है। आशा है यह अंक आपको पसंद आयेगा।

साभार |

Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world.

-Louis Pasteur

India International Science Festival (IISF) launched in 2015 is a celebration to promote Science and Technology and demonstrate how science could lead India towards a developed nation within a short span of time. The aim is to engage the public with science and celebrate the joy of science and show the ways how science, technology, engineering and mathematics (STEM) provide us with the solutions to improve our lives. Ministry of Science and Technology and Ministry of Earth Sciences in association with Vijnana Bharati (VIBHA), has created a unique platform of India International Science Festival which intends to inspire curiosity and make learning more rewarding.

The global pandemic caused by CoViD-19, which has created a worldwide havoc, has levied a heavy burden on economy and global supply chain - compelling every nation to create indigenous solutions to fulfill the technological needs. In this light, following the call of the Honorable Prime Minister for a Self -Reliant India ("Atmanirbhar Bharat"), the theme of IISF 2020 has been chosen as "Science for Self-Reliant India and Global Welfare." Due to restrictions imposed by the pandemic, this mega-event is being organized in virtual event, maintaining all the CoViD protocols.

IISF-2020 will be commencing from 22 December 2020, marked by the birthday of world renowned Indian mathematician Srinivas Ramanujan and will be concluded on 25 December 2020, coinciding with the birthday of former Prime Minister of India Shri Atal Bihari Vajpayee – known for his remarkable commitment to the belief that S&T would always be at the core of the nation's progress. Like the previous years, IISF 2020 is going to be a vibrant combination of seminars, workshops, exhibitions, lectures, panel discussions & debates with interactive engagements, hands-on demonstrations, film and magic shows, science-related theatre, music and poetry. The overall scope of this event is being covered by a total 41 events which have been carefully chosen in relevance with current national scenario, rich science heritage of India and extending the same towards a bright future of our great nation. Some of the prominent events include Agricultural Scientists Meet, Biodiversity Conclave, Clean Air, Energy Conclave, Face-to-Face with New Frontiers of Science, Global Indian Scientists & Technocrats Meet, Health Research Conclave, History of Indian Science, Industry Academia Conclave, International Science Film Festival of India, National Science Teachers Congress, Nav Bharat Nirman - Building of the New India, New Age Technology Show, Science and Performing Arts, Students Engineering Model Competition, VigyanYatra etc.

Students Engineering Model Competition (SEMC), being one of the major events of IISF-2020, is being organized by CSIR-CEERI, Pilani under the dynamic leadership of its Director Dr. PC Panchariya. The primary objective of the SEMC event is to provide a platform to the young students to showcase their innovative ideas through working engineering models. The themes for this year's SEMC competition are, Digital Bharat, Atma Nirbhar Bharat, Swachha Bharat, Swastha Bharat and AgriTech. The innovation and demonstration of engineering models will be helpful to the socio-economic development of the nation through this mega event of celebration of science, IISF-2020.

The poster for the India International Science Festival 2020 features the theme "Science for Self-Reliant India and Global Welfare" and "Engineering Model Competition Meet & Expo Pathway for Self Reliant Bharat". It includes details about the event dates (22-25 December 2020), the organizing body (CSIR-CEERI, Pilani), and the director (Dr. PC Panchariya). The poster also lists the themes for the SEMC competition: Digital Bharat, Atma Nirbhar Bharat, Swachha Bharat, Swastha Bharat, and AgriTech. It provides information on how to apply, eligibility criteria, and contact details for the event.

## ORGANISATION STRUCTURE

### Vigyan Bharati Rajasthan: Parichay

Vigyan Bharati Rajasthan (also known as VIBHA Rajasthan) is a state chapter of Vijnana Bharati, under its central zone. The journey of VIBHA Jaipur prant started in 2002 when it got registered with Registrar of Cooperative Societies, Rajasthan. It has more than 400 active members comprising of senior faculties of eminent education institutes, Teachers, Scientists, Engineers, technocrats, Doctors, Entrepreneurs, Science Communicators, Social activists students, senior officers of State and Central Governments etc from all over Rajasthan, who voluntarily work for the noble cause of Nation building through Science & Technology. ViBha Rajasthan has been organizing various activities along with active participation in national programmes like India International Science festival (IISF), Vidyarthi Vigyan Manthan (VVM), Bhartiya Vigyan Sammelan (BVS) etc. to fulfill the aim of Vijnana Bharati. Some glimpses of past programmes are given in this inaugural issue., students, senior officers of State and Central Governments etc from all over Rajasthan, who voluntarily work for the noble cause of Nation building through Science & Technology. ViBha Rajasthan has been organizing various activities along with active participation in national programmes like India International Science festival (IISF), Vidyarthi Vigyan Manthan (VVM), Bhartiya Vigyan Sammelan (BVS) etc. to fulfill the aim of Vijnana Bharati. Some glimpses of past programmes are given in this inaugural issue.

**It is said that a man  
without religion is like a  
horse without bridle**

**- Sarvepalli Radhakrishana**

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### Vijana Bharati: National

India faces critical challenges as a nation in its march towards a welfare state. Considering the nature of the challenges which are so unique, only rapid strides in the sector of science and technology, in resonance with India's heritage can meet those challenges. In this context Vijnana Bharati, a science movement with Swadeshi spirit has a greater role to play.

Swadeshi Science Movement was started in Indian Institute of Science (Bengaluru) by a few eminent scientists under the guidance of Prof. K I Vasu. This movement gradually gained momentum and emerged as Vijnana Bharati in 1991. Vijnana Bharati is popularly known as Vigyan Bharati (ViBha) The foundation principle of VIBHA is made mainly -

As a vibrant movement for the development of Swadeshi Sciences

As a dynamic Science Movement with a Swadeshi Spirit, interlinking traditional and modern sciences on the one hand, and natural and spiritual sciences on the other hand

As a Swadeshi Movement with modern sciences adapted to national needs

### Sthapna Divas and launch of e-news letter

Sthapna Divas of Vijnana Bharati was celebrated on 21/10/2020 at CSIR CEERI Jaipur Centre.

The program started with the virtual auspicious presence of Jayant Ji Sahasrabudhe, Shankar Tatwawadi Ji, L.S. Rathore Ji, CSIR DG Shekhar Mande. Dr Meghendra Sharma welcomed all. Sh. Tatwawadi Ji conveyed that how Vigyan Bharati started at national level with just 60 persons in 1990 and with the intention of dedication and devotion towards Nation, like a Ganga river which started from small Gangotri and later on spread out all over to do green and fruiting trees for people.

Jayant Ji said all members of Vigyan Bharti should have to see that we are now in Vigyan Bharati but now we have to bring Vigyan Bharati within us. He also put emphasis that We have to value about our own Bhartiya Vigyan, knowledge, ayurveda etc.

DG CSIR Dr Shekhar Mande in his address shared that due to Corona this time IIFS will be held in a different manner(online). The dates will be 24, 25 and 26 December 2020.

Following this Vigyan Bharati Rajasthan e-news letter was released by Sh Jayant Sahasrabudhe.



### Bharat Ratna Dr. C.V. Raman Jayanti & Inauguration of SEMC -IISF 2020 Control Room

Nobel laureate Bharat Ratna Dr. C.V. Raman Jayanti celebrations was organized on 7<sup>th</sup> November, 2020 as e-Paricharcha. Prof. Satheesh Krishnamurthy (UK), Prof Sandeep Sancheti (SRM) I delivered the Keynote and Dr. Shrikant delivered the Inaugural talk. Prof Roshan Lal Raina (VC, JKLU), Dr. PC Panchariya (Director CEERI - Pilani) were among the other speakers.

The SEMC \_ IISF 2020 Control Room is also being inaugurated at CSIR CEERI Jaipur Center on the same day. Vibha membership drive campaign was also run in the entire state, the report of which were discussed Vibhagwar.

### VVM Desk

Vidhyarthi Vigyan Manthan is a Talent Search Exam at national level for students of class sixth to class eleventh. This year, the exam was conducted in the month of October under the convenorship of Sh. Ashok Ramani and Dr. Sumit Gupta. The mode of examination was online due to COVID-19 Pandemic. Around 5000 students were registered from Rajasthan out of which 123 students qualified for state level camp.

### Vibha-Shakti Desk

Vibha shakti Rajasthan organised curtain raiser programme IISF 2020 woman scientists and entrepreneur conclave outreach programme on 17 Dec in collaboration with many academic institutes under convenorship of Dr. Madhu Srivastava and Dr. Kavita Tak.

The programs aims to promote awareness on the important role of woman in sustainable growth growth of the country via science and technology. It was realised that if woman is educated she will handle todays issues in a better way.



### Curtain raisers for IISF-SEMC 2020

In order to encourage the participants and make awareness, the curtain raiser programmes are being organised in top notch institutes of engineering, science and technology, agriculture etc. The eminent personalities, students are participating and sharing their experiences.

## Personality

**Dr. P.C. Panchariya**  
**Director,**  
**CSIR-CEERI,**  
**Pilani**



Dr. PC Panchariya, has taken over as the Director of CSIR-Central Electronics Engineering Research Institute (CSIR-CEERI) on 14th July, 2020. Prior to this Dr. Panchariya, Chief Scientist, CSIR-CEERI, was leading CEERI's Incubation-cum-Innovation Hub, Jaipur as the Scientist In charge and was also the Head of the Signal Analytics Group of the Institute. He also holds the position of professor in the Academy of Scientific and Innovative Research (AcSIR) and has been associated with research and development activities in the field of Intelligent Measurement Systems.

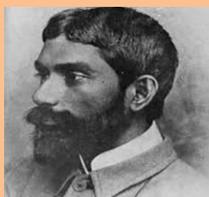
Dr. Panchariya did his Ph.D. at the Institute of Instrumentation, Devi Ahilya University, Indore and Institute of Automation, Bremen University, Germany.

Dr. Panchariya received DAAD fellowship from the Institute of Automation, University of Bremen, Germany, in the year 2000-2002. He was awarded the prestigious Scotch Gold Award in December, 2017 for developing the Milk Adulteration Detection System. He is also the fellow of the Institute of Engineers, IETE and the Indian Metrology Society and member of IEEE – Instrumentation and Measurement Society and European Federation of Food Science and Technology.

## Modern Indian Scientist

### Acharya Prafulla Chandra Ray

Known as “Father of Indian Chemistry”, Prafulla Chandra Ray was a well-known Indian scientist and teacher and one of the first “modern” Indian Chemical researchers. Prafulla Chandra Ray was one of the greatest Chemist of India. He was the founder of India's first Pharmaceutical company, Bengal Chemicals & Pharmaceuticals.



He was awarded the Hope Prize for his thesis and research on ‘Conjugated Sulfate of Copper Magnesium Group: A Study of Isomorphs Mixtures and Molecular Combinations.’ Soon after finishing his doctorate, he became a professor at the Presidency College in Calcutta. There he was awarded to the Presidency University in honor of Acharya Prafulla Chandra Ray.

Collection: Dr Keshav Ameta, Mody University, Lakshmanagarh, Sikar

## Ancient Indian Scientist

### SUSHRUT : FATHER OF PLASTIC SURGERY

In 1794 an article published in *The Gentleman's Magazine and Historical Chronicle* introduced the skills acquired by Indians over a long period of time to Europe and that brought about the advent of Plastic Surgery in Western Science. Europe was shocked to learn that there was much to learn from the ancient Indian knowledge system then they were ready to acknowledge. Sushrut, the father of Plastic Surgery, was one of the first surgeon who wrote a valuable treatise on Medicine and Surgery, compiling all that he had learned and discovered from his teachers and practice.

Sushrut was a great surgeon and the oldest treatise on Surgery, *Sushrut Samhita*, is attributed to him (approximately 600 B.C E.) Though his thesis is mainly devoted to surgery, it also includes chapters on Medicine, pathology, anatomy, midwifery, biology, ophthalmology etc. Sushrut's forte however was Rhinoplasty (Plastic Surgery) and Ophthalmology (Ejection of cataracts).

Sushrut lived and taught surgery in Kashi and was one of the pioneers to study human anatomy. In the Sushrut Samhita he describes in detail the study of anatomy with the aid of a cadaver. The very fact that he worked with dead bodies busts many myths surrounding Indian society and its scientific attitude as propagated by Eurocentric authors. The science of surgery as described by him is very precise and can be easily compared to the modern science. He described Surgery under eight heads, along with description of equipment's and surgical implements to be used for performing those surgeries.

Several of the surgical procedures described by him are still being practiced in India or at least were till the European masters decided to destroy Indian Knowledge System and impose their supremacy over traditional knowledge. As present-day Indian medicine men are debating whether it is right to permit Ayurvedic doctors to perform surgery or not we must not forget that although ancient surgery did not reach that perfection which the modern science has attained that should not hold us back from giving the credit due to the ancient scientists who had attained a high level of precision with their limited resources.

Collection: Dr. Veenu Pant, Central University, Gangtok, Sikkim.

## Social awareness

Dr . J. B. Khan Associate Professor Botany, Govt Lohia College, Churu planned to adopt “**No vehicle day**” on first day of every month since 2017. Now it has been adopted by people of whole Churu district. The campaign has been appreciated at several platforms.

## NEP 2020: Context of Indian Agriculture

**Dr Shanti K Sharma**

**Maharana Pratap University of Agriculture and  
Technology, Udaipur, Rajasthan**

The National Education Policy (NEP) 2020 inter alia talks about professional education and the need to revive and develop Professional Courses in Agriculture. Agriculture Universities have sufficient land available for experimentation, demonstration of various trials to farmers and training. AUs must develop schemes for adequate resource generation and convert themselves into self-governing institutions, which is reflected in the NEP.

The AUs need to attain the highest global standards in quality agriculture education through linkages with global universities and provide platforms for research and innovation in frontier areas of research, greater industry-academic linkages and interdisciplinary research, including humanities and social sciences.

Agricultural education with allied disciplines will be revived. Although Agricultural Universities comprise approximately 9% of all universities in the country, enrolment in agriculture and allied sciences is less than 1% of all enrolment in higher education. Both capacity and quality of agriculture and allied disciplines must be improved in order to increase agricultural productivity through better-skilled graduates and technicians, innovative research, and market-based extension linked to technologies and practices. The preparation of professionals in agriculture and veterinary sciences through programmes integrated with general education will be increased sharply. The design of agricultural education will shift towards developing professionals with the ability to understand and use local knowledge, traditional knowledge, and emerging technologies while being cognizant of critical issues such as declining land productivity, climate change, food sufficiency for our growing population, etc. Institutions offering agricultural education must benefit the local community directly; one approach could be to set up Agricultural Technology Parks to promote technology incubation and dissemination and promote sustainable methodologies.

Overall, the NEP 2020 addresses the need to develop professionals in a variety of fields ranging from Agriculture to Artificial Intelligence. India needs to be ready for the future. And the NEP 2020 paves the way ahead for many young aspiring students to be equipped with the right skillset. Its proper implementation will be the key to its success. The focus will also be in preparing Professionals in cutting-edge areas that are fast gaining prominences, such as Artificial Intelligence (AI), 3-D machining, big data analysis, and machine learning, in addition to genomic studies, biotechnology, nanotechnology, neuroscience, smart organic farming with important applications to health, environment, and sustainable living that will be woven into undergraduate education for enhancing the employability of the youth.

## Current news/events in Science

Compiled by Prof. Ashwini Kumar, Jaipur

### Nobel Prizes 2020

#### Chemistry:

The Royal Swedish Academy of Sciences has decided to award the Nobel Prize in Chemistry 2020 to (1) **Emmanuelle Charpentier** Max Planck Unit for the Science of Pathogens, Berlin, Germany (2) **Jennifer A. Doudna** University of California, Berkeley, USA "for the development of a method for genome editing" They transformed an obscure bacterial immune mechanism, commonly called CRISPR/Cas9 genetic scissors, into a tool that can simply and cheaply edit the genomes of everything from wheat to mosquitoes to humans. (<https://www.nobelprize.org/prizes/chemistry/2020/press-release/>)

#### Physiology or Medicine 2020

The Nobel Prize in was awarded jointly to **Harvey J. Alter, Michael Houghton and Charles M. Rice** "for the discovery of Hepatitis C virus." Harvey J. Alter, Michael Houghton and Charles M. Rice made seminal discoveries that led to the identification of a novel virus, Hepatitis C virus. The discovery of Hepatitis C virus revealed the cause of the remaining cases of chronic hepatitis and made possible blood tests and new medicines that have saved millions of lives. (<https://www.nobelprize.org/prizes/medicine/2020/press-release/>)

#### Climate change conference

The UK will host the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow on 1 – 12 November 2021. The COP26 summit will bring parties together to accelerate action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change. (<https://twitter.com/COP26/status/1332277993180282880>)

#### Workshop Proposal

The American Society for Plant Biology (ASPB) Program Committee is pleased to invite proposals for inclusion in the Plant Biology 2021 program. The Program Committee will review the proposals for currency (new and up-to-date information), their relevance and value to the community, and for a global perspective. The committee also encourages submissions from early career researchers who can conduct or help develop the workshop. The details are available on <https://aspb.org>.

**Science is a beautiful gift to  
humanity; we should not distort it.**

**APJ Abdul Kalam**

## Fellowships for Pursuing Ph.D. Programmes

Compiled by N K Gupta  
SKN Agriculture University, Jobner

Fellowship	website	Application time	Amount
1. INSPIRE - Assured Opportunity for Research Careers (AORC) pursuing Ph.D.	<a href="http://inspire.gov.in">inspire.gov.in</a>	November	Rs.7Lakhs for 5yrs.
2. ICAR-SRF Fellowship ICAR AIEEA-SRF Exam.	<a href="https://icarexam.net">https://icarexam.net</a>	June- July	Rs. 31,000/- p.m for initial 2 years and Rs. 35,000/- p.m. for 3rd year.
3. UGC-National Fellowship for OBC	<a href="http://www.ugc.ac.in">www.ugc.ac.in</a>	Oct- Nov	Rs.31, 000/- p.m. for initial two years and Rs.35, 000/- P.M for third year.
4. UGC-Rajiv Gandhi National Fellowship (RGNF) to SC and ST candidates	<a href="http://www.ugc.ac.in">www.ugc.ac.in</a>	Oct- Dec.	Rs.25, 000/- p.m. for I year year and Rs.28,000 /-P.M for remaining two years.
5. Moulana Azad National Fellowship for Minority Students	<a href="http://www.ugc.ac.in/manf/">www.ugc.ac.in/manf/</a>	June	For Social Sciences: Rs.31, 000/- p.m. for initial two years and Rs.35, 000 /- P.M for remaining one year. For Science &Technology: Rs.12000 P.M for 2 years and Rs.25,000 for remaining one year.
6. Indian Council of Social Science Research (ICSSR) Fellowship	<a href="https://icssr.org">https://icssr.org</a>	June- July	Rs.20, 000 Per month for two years.
7. UGC-NET JRF	<a href="http://www.ugc.ac.in">www.ugc.ac.in</a>	May- June and Oct-Nov	Rs.25,000/P.M. for 2 years and Rs.28,000/- PM for 3 <sup>rd</sup> year onward.
8. CSIR-NET	<a href="http://csirnet.nta.nic.in">csirnet.nta.nic.in</a>	June- Aug.	Rs.31,,000/P.M. for 2 years and Rs.35, 000/- PM for 3yrs.
9. Women Scientist Scheme- B (WOS).	<a href="http://online-wosa.gov.in">http://online-wosa.gov.in</a>	Feb- March	Rs.55,000 PM for Ph.D. and Rs. 40,000 PM for M.Sc.
10. DST-Science and Technology Innovation Policy Fellowship Scheme.	<a href="https://dst.gov.in">https://dst.gov.in</a>	Feb- March:	50,000 PM for Senior Policy Fellow (Ph.D), Postdoctoral Fellow, (Ph.D.) 30,000 PM for Young Policy Professional (M.Sc.)
11. Swami Vivekananda Single Girl Child Scholarship for Research in Social Sciences (Single Girl Child)	<a href="http://www.ugc.ac.in/sv_sgc">www.ugc.ac.in/sv_sgc</a>	Nov- Dec.	Rs. 25,000 per month for 2years and 28,000 P.M. for remaining 3yrs.
12. Netaji-Subhas ICAR International Fellowships	ICAR <a href="http://Icar.org.in">Icar.org.in</a>	July- Aug.	Indian fellows going abroad: US\$ 2,000/- per month US \$1,000 per expenses per year.

## Agri Startup

Dr. A.K. Gupta

Dean, SKN College of Agriculture, Jobner

An innovative business idea in agriculture and allied sectors can now earn you up to 25 lacs from the Government of India. The Government of India in an effort to strengthen the agricultural sector has come up with various schemes to incentivize and reward individuals and startups with innovative agri-business ideas. One of these schemes is the RKVY-RAFTAAR (Rashtriya Krishi Vikas Yojana - Remunerative Approaches for Agriculture and Allied Sector Rejuvenation) from the Ministry of Agriculture and Farmers Welfare, New Delhi, Government of India, where in the Government has developed incubation facilities with institutes and Universities having infrastructure and technical expertise to bolster the efforts of people having ideas, but lack the resources and guidance to take their ideas or businesses to the next level.

Sri Karan Narendra Agri-Business Incubator (S-ABI) under Shri Karan Narendra Agriculture University, Jobner is one such incubators where you can give wings to your ideas with the necessary resources and funding support. As per the principal investigator Dr. A. K. Gupta, Dean & Faculty Chairman at SKNAU, Jobner

S-ABI helps promising startups at two different initial stages of a business life cycle. *ABHYUDAY* which is a pre seed stage funding programme helps you to give a form (develop a product/process /technology) to your logical innovative business idea and provides a funding support upto Rs. 5 lakhs. *KALPVRIKSH*, a seed stage funding programme on the other hand provides you the necessary resources and guidance to scale up the already existing business, which you have started using the innovative idea with a funding support of up to Rs. 25 lacs. Two months of residential training cum mentoring programme in the serene campus of SKNAU is an integral part of the scheme to give a strong foundation to your business by honing the skills necessary to establish a business and by providing links and interaction with industry experts, technical expertise and mentoring related to your project, field visits, market linkages, networking etc. the expenses of which are beard by the incubation centre. A provision of Rs. 10,000 per month as stipend has been made to help young agripreneurs at ideation stage as a sustenance amount.

The Government of India through incubators like Sri Karan Narendra Agri-Business Incubator, Jobner is endeavoring to boost the agriculture economy which employs more than 50% of India's workforce by making them independent and opening the avenues to be the job creators rather than the job seekers. S-ABI serves as a platform for those budding entrepreneurs who want to make a mark and contribute in nation building by making the agricultural sector more organized, rewarding, robust and remunerative. So if you have an innovative business idea in agriculture or allied sectors, here's a golden chance to "Give Wings to Your Ideas" and make your dreams come true

## Formulation of a newly synthesized Gomutra emulsified diesel (GMD emulsion) fuel

Dr. Amit Jhalani,

Modi University, Niwai

The current era of the energy crisis and environmental imbalance stresses for energy-efficient and low-pollution transportation fuels. To address this issue, a newly synthesized gomutra emulsified diesel fuel (GMD emulsion) is formulated and a comprehensive experimental study has been performed over it. Gomutra constitutes of around 95% water and exhibits the benefits of water emulsification to improve the brake thermal efficiency (BTE). Additionally, it consists of urea which works as a reducing agent and significantly cuts-down the NO<sub>x</sub> emissions. Sodium, magnesium, calcium and potassium present in the cow-urine were also found to enhance the fuel properties.

A substantial investigation to assess the applicability of this newly synthesized GMD emulsion on the basis of stability, physicochemical properties, engine performance, and exhaust emissions was also performed. The GMD emulsion was found to satisfy all the standards of physicochemical properties like viscosity and density. However, the stability of this fuel is a concerning issue as it remains stable up to maximum 50 days. Over this time duration it gets separated into its original components. Hence, this fuel could be used in stationary diesel engines right now. Further research is going on to increase its stability after which it could also be used for vehicular application.

The experimental results were compared with the base fuel diesel for engine performance and emissions. An emulsion with 82% diesel, 15% gomutra distillate and 3% emulsifier was found to be applicable with a remarkable increase in brake thermal efficiency (BTE). The BTE reached up to 24.8% as compared to 21.9% with plain diesel fuel. It is a significant 13.2% increase in the efficiency of engine. It reflects around 13.2% reduction in diesel consumption and increase in the engine mileage. From pollution control point of view, NO<sub>x</sub> and smoke got reduced by maximum up to 31.8% and 36.9% respectively. Overall, this gomutra emulsified diesel fuel is an energy-efficient, economic and cleaner alternative fuel for stationary C.I. engine application. Moreover, this research will also be beneficial for rural development, increase in the earnings of animal husbandry sector (especially *Goshalas*) and waste management.

## CAPACITY BUILDING AND SKILLING FOR HIGH ORDER INDUSTRIAL REVOLUTION-

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Government of India is emphasizing very much on skilling and capacity building so as to make youth acceptable to the industry for employment so as to make India as a **Global Human Resource Capital** of the world in the times to come. Indians are well-known for logics, adaptability, hard-work and genetically good in mathematics, yet they are not able to meet international standards, what they can do and deliver to the world with, if we train them within our system to match the best in the world. A peep into the history would reveal that our youth has done exemplary work in the field of IT where many CEOs are of Indian origin, and are leading the globe with aplomb. It is surprising that ours is the second largest country in terms of population where as it is also among few with largest unemployment rate. As per Industry feedback only 20-25% youth coming out from colleges are employable. Only 3-4% are skilled in our country in comparison to 96% in Korea and 64% in China.

According to The World Economic Forum's report "The future of jobs," the Fourth Industrial Revolution, which include developments in previously disjointed fields such as artificial intelligence and machine-learning, robotics, nanotechnology, 3-D printing, and genetics and biotechnology, will cause widespread disruption not only to business models but also to labour markets over the next five years, with enormous change predicted in the skill sets needed to thrive in the new landscape.'

This is the opportune time when we Indians have got the youngest population in the country that Govt. of India as well as State Governments should work in unison to create entrepreneurship, skilling, re-skilling and capacity building so as to make the youth more conducive to employability and productivity. This is one of the reasons that even the concept of V B.Tech has evolved where there will be lateral entry and also shifting from one vertical to another vertical based on past experience and education is being taken in to account. Educational Institutions in the country are also keen to speed up the process of adaptation of new and innovative courses to meet the challenges that the world offer where the work force in other parts of the world are becoming older and older and the work-force in India is young and can be rightly tailored to meet the global requirement. The Govt.of India has come out with new education policy 2020 concentrating on above framework, where even Humanities and Arts are to be integrated with Science, Technology, Engineering and Mathematics (STEM). Emphasis is on Learning to Know, Learning to Do, Learning to live Together and Learning to Be.

The ten identified skills to meet the challenges of skilled manpower are - complex problem solving, critical thinking, creativity, people management, coordinating with

others, emotional intelligence, judgement and decision making, service orientation, negotiation and cognitive flexibility.

Every industry expects following from the prospective employees - good appearance, planning skills, good mannerism, good customer care services, time management, positive attitude, tolerance, dependability, trustworthiness, confidence, working in team environment, ICT skill, management skills, organizational skills, presentation skill, listening skill, friendliness, hard-working, communication skills like oral and written etc. etc. The problem with the present education system is that it generally concentrate on what is being taught by the teachers but the fact is that we need to concentrate mainly on what he/she is learnt rather than what is being taught. Thus, there is urgent need that the education system that impart technical, managerial, professional, non-professional lessons to its students, need to eventually work on 10 skill sets as mentioned above.

Similarly, it is also very essential for those who are already in service/employment need to be mentally prepared for **re-skilling** for giving better productivity and return to the employer. Govt. has made many changes in the system for the last 10 -12 years but more changes are required for better employability of the youth and one of the major change expected is that instead of new academic qualifications, after basic qualifications like MA., M.Sc., M. Tech, C.A., M.B.B.S. etc. the hands-on and practical experience in the industry or in the field of work shall have to be given weightage. The idea is that it is very simple to teach on blackboard how to drive a motorcycle, it may be an hour's lecture, sufficient to teach it theoretically but the fact is that when one to drive the motorcycle on road and it may take a day or two or perhaps more than that. It is a Good Management course teacher may not be a Good Marketing Manager or an entrepreneur.

If theoretical education would have given sufficient knowledge then all those faculty members who are in IITs, IIMs would have run their own industry better than what other industrialists are doing who have never gone for any management/engineering courses. This implies that the field experience counts more than the class room education for better productivity .The youths need to contribute on social platform also in order to have attachment with the society and also to have better process designing for the up-liftment of the society.

It is now a truth acknowledged in many quarters that our young graduates will have to live and work in a steadily more automated and disruptive world. The ability to think well, and think fast, will assume greater significance than it has thus far. With the Digital India vision of Government of India and also rapid change in technology aspects Artificial Intelligence (AI),Machine Language (ML),Internet of Things (IoT), Data Analytics (DA),Big Data (BD) etc will play major role in every aspect of life.