



ADDRESS BY THE HONORABLE CHIEF GUEST



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Prof. Prem Vrat, Chairperson, Board of Governors, IIT Mandi, Prof. Ajit Kumar Chaturvedi, Director, Members of Board of Governors, Members of faculty, staff, invitees, students specially the ones graduating today, ladies and gentlemen. Let me at the outset express my gratitude to the Director, IIT Mandi for the invitation to today's convocation. I am indeed very happy to be with you, though virtually.

IIT Mandi is one of the newer institutions among the chain of IITs, a system of higher technology education and research institutions in the country that has done India proud. I remember, I had visited IIT Mandi during its early years of formation. I also had interacted with Prof. Timothy Gonsalves, your founder Director during our working together to implement the recommendations of Kakodkar Committee on IIT reforms. I have thus, some nostalgic feelings as I participate in this convocation.

My congratulations to all those graduating today. The world today has unprecedented challenges as well as opportunities before it. I am sure, graduating from IIT Mandi would turn out to be a great asset for you, as you move forward in your career. May all your dreams be fully realised.

Research Entrepreneurship Synergy

I wish to use today's occasion to talk about research entrepreneurship synergy. I believe that this should be an urgent focus for us where IITs and more particularly the newer IITs can lead from the front. We need to enhance our research excellence and also bridge the research entrepreneurship gaps on one side while we shape our young people with right capability and mindset on the other. Our institutions have to be both knowledge creators as well as value creators. Between the years 2008 and 2018, India's publications of science and engineering articles increased from 48,998 to 1,35,788, an average annual growth rate of 10.73 per cent. The country now accounts for 5.31 per cent of the total world publications in science and engineering and stands at the third position behind China and USA. While we have a lot of further ground yet to be covered both in terms of numbers as well as quality, we are well on our way to become world class knowledge creators. However, in the context of value creation, India ranks 40th on International Intellectual Property Index and stands at 20th spot among the top 100 countries that have been ranked in the Global Start up Ecosystem Index 2021 by the Start-up Blink. We have done relatively better in a short time in the start-up space. However not all start-ups can be categorised as high-tech start-ups. While innovation does spur economic growth, we need innovations in high-tech space to become globally competitive. This is where IITs have to lead and make a difference to the country. Something that has started happening.

An extreme example for us to emulate is Stanford University whose alumni and faculty have created nearly 40,000 companies that generate around USD \$2.7 trillion in annual revenues. The Industry and Research University ecosystem, like Stanford University – Silicon Valley are great success stories. Our IIT Madras Research Park is a good beginning in this direction. More such examples are in the making. We need many more such initiatives.



We are now in an era dominated by high end technologies like Semiconductors, Artificial Intelligence, Computing and Telecom, Clean Energy, Advanced Aerospace and Pharmaceuticals. Soon new frontier technologies exploiting Genetics, Quantum Physics, Cognitive and Brain Sciences etc. would start dominating. We need to close in our gaps in these technologies which currently seem to be expanding. Not being able to do so would not only put us at disadvantage but could in fact make us vulnerable through emergence of new technology denial regimes even in commercial sectors, holding hostage entire segments of our nation's economy. We thus must quickly become a massive producer of high end and frontier technologies. A well-knit research entrepreneurship ecosystem involving close partnerships between academia, industry and government is a critical necessity for this purpose. This is a necessity for our national security, our economic prosperity, and our societal well-being.

Rural Development

As we prepare ourselves to be in the forefront of emerging high-technology and be a front runner in the global competition, we need to be also aware of bridging the urban – rural gaps which seem to be growing. Rural development in India in fact needs a special focus. Two third of India lives in villages with less than half per capita income as compared to urban areas. Bridging the urban rural divide at least in terms of livelihood opportunities is thus a matter of urgent necessity in our country. The emerging era of knowledge driven economy that facilitates democratisation and decentralisation of economic activities is thus a great opportunity for transformation of rural horizon. This however would involve capacity building of local people in dealing with emerging technologies and also ability to internalise technologies and build on them including solving problems during their implementation, locally. Eventually we should create a locally relevant innovation ecosystem that can leverage the opportunities of knowledge era. In principle, I believe, one could have greater opportunities in villages rather in cities reversing the industrial era paradigms. CILLAGE – a knowledge integrated sustainable village development model aims to leverage new and appropriate knowledge-based technologies, including some created locally, to create additional and higher-level livelihood opportunities in villages that also include manufacturing and service sector activities in addition to agriculture and allied activities.

In the CILLAGE concept, a local Higher Technical Education Institution (HTEI) serving as a Knowledge Partner (KP) hosts a Rural Human and Resources Development Facility (RHRDF) and linked with local community institutions and NGOs, works for deployment of appropriate technologies for enhanced livelihood and related educational and knowledge support in the neighbourhood. To facilitate sustained and comprehensive engagement between RHRDF and the neighbourhood, a number of AKRUTI (Advanced Knowledge based Rural Technology Initiative) sub-centres need to be established in proximity with existing schools. RHRDF and AKRUTIs would



be the bridge between HTEI and the neighbourhood to spread technology enabled livelihood, ICT enabled school education etc. on one side and solving problems in implementation of new technologies and search for new R&D problems on the other. The eco-system so created could also participate in deployment of other Govt. Schemes.

Spread of technology adoption and continuous access to new technologies could create better livelihood opportunities in rural domain that eventually compare well with opportunities in urban domain thus leading to convergence of best of **city** (i.e., opportunities for self-progress, modern infrastructure for education etc.) with best of a **village** (i.e., clean, calm and eco/human-friendly environment). Thus, the selected cluster of villages (**Cillage**) around a vibrant knowledge institution can be expected to become preferred working destination for young innovative and creative generation for leveraging local human and raw material resources on one side and new knowledge technologies on the other. Cillages could thus become places, better than both cities and villages and may become the preferred habitats for the new age society in most of emerging India. This approach is being tried out on an experimental basis at a few places in Maharashtra. Advanced knowledge and technology institutions like IIT Mandi could be the fountain heads for creating Cillages, spearhead development and minimise disparities.

Technology with Human Heart

IITs and IIT graduates have a special role in this context. Technology and technology products that offer differentiating capability to their users, significantly add to their competitiveness and hence to their power both in the market place as well as strategically. This has several ramifications for our national progress as well as our relative position in the competitive world that exists around us. Both these dimensions are of immense importance. While the technology empowers humans, the education that we provide to our young people should also make them responsible and ensure that technology remains non-exploitative and is used to empower everyone around through knowledge and minimise the disparity gaps that are becoming alarming by the day. This requires bridging the gaps globally to eliminate security deficit and usher in peace as also bridging the disparity gaps within the country to eliminate rich-poor, urban-rural and such other divides even as the technology uplifts the society as a whole. While this is a complex matter having multiple dimensions, I do believe that knowledge and more particularly knowledge technologies can be most effective in addressing this challenge. That is where graduates from IITs, which are India's foremost knowledge and technology institutions come in. I do wish all of you to be successful in your professional career and make an important difference to our country in the above context.



Closing Remarks

I wish that all of you would give some serious thought to what I have said above and decide your respective course of action. It should be our collective endeavor to progressively move towards making the world a better place to live. Through a lifelong learning process and maintaining knowledge institutions, industry and society interconnected with each other, each one of us, regardless of career we decide to pursue, can meaningfully contribute to this objective. After all we are all in this world to play our respective roles. Our happiness and joy of life depends on how well we play our roles.

To dear students, I once again wish all of you well in your respective further pursuits. I am certain, you would rise progressively in your respective careers. I do hope that as you rise, you will retain in you a spirit of trusteeship and contribute substantially to your roots, the society around, the institutions that brought you up and the nation at large. It is this spirit of trusteeship and the desire to support others who were not as fortunate or as successful as us that makes this world a better place. We must remember that our happiness depends on the happiness all around us.

Once again, my best wishes to you all.

Thank you.

Prof. Anil Kakodkar

