

Science Technology and Innovation Policy (STIP) Forum Lecture Series

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The Science Technology and Innovation Policy (STIP) Forum was set up with the objective of promoting debate on various aspects of Science, Technology and Innovation Policy. The Forum goes beyond the disciplinary boundaries by taking into account the intersectionality of S&T and I. It aims to bridge the gap between the science and society for dissemination of scientific achievements as well as for generalising debate of societal aspirations and promoting responsible research and innovations. The monthly series of public lectures has been launched (since September 2017) to sensitise the public discourse on science, technology and innovation policy. Research and Information System for Developing Countries (RIS), The Energy Resources Institute (TERI), Indo-French Centre for the Promotion of Advanced Research (CEFIPRA), Vigyan Prasar and India Habitat Centre (IHC) are the collaborating partner institutions. This event report provides a snapshot of the STIP lectures organised in March and April 2022.

Dr K Sridhar, Honorary Secretary, Neurological Society of India, delivered the 42nd STIP Forum Lecture on 28 March 2022 via online platform.¹ The topic of this public lecture was “*Rewiring the Brain*”. The programme was moderated by Dr Kinkini Dasgupta Misra, Scientist F, Vigyan Prasar. Dr Sridhar began his address by providing an overview of the critical role the brain plays in our existence as a living being. He elaborated on the various processes in terms of neural networks and reactions that happen inside the brain to

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help us speak, act, smell, think and so on.

Dr Sridhar went on to explain how the 'rewiring' of the brain can help solve many neurological disorders such as epilepsy, brain stroke, Parkinson's disease and dementia through the technique called Neuro Plasticity. This new technique allows re-establishing the lost connections, enabling new connections and removing bad connections. There are two types of neuro or brain plasticity i.e. structural plasticity and functional plasticity. He also gave a detailed account on how reprogramming of the brain through deep brain stimulation can help address conditions like Parkinsonism, dystonia, OCD and epilepsy. In this process, electrodes are placed in the deep nuclei of the brain and the stimulation makes the brain work better. Dr. Sridhar also discussed about neuro rehabilitation and its significance in treatments.

At the end, Dr Sridhar reiterated that rewiring the brain and the nervous system is possible today owing to the technological advances in the medical sciences and an effort has to be made to aggressively use these advance techniques at an early stage to successfully treat any such existing or potential neurological disorder(s).

The 43rd STIP Forum Lecture was delivered by Mr Senapathy Gopalakrishnan (Kris), Co-Founder and Former Vice-Chairman, Infosys, Chairman, Axilor Ventures and Chairman, CII AI Forum and CII Start-up Council, on 28 April 2022 via online platform.² The topic of this public lecture was "*Why Invest in Research on Brain Sciences?*". The event was chaired by Professor K Vijay Raghavan,

Former Principal Scientific Adviser to the Government of India. Welcome remarks were delivered by Professor Sachin Chaturvedi, Director General, RIS, followed by brief remarks by Mr. Sunit Tandon, Director, India Habitat Centre.

In his very insightful address, Mr Gopalakrishnan provided an overview of the significance of undertaking research in the domain of brain sciences. He articulated that the huge amount of data that would emerge in such research on brain sciences would help us understand how the brain develops, what changes take place during aging or at the time when disease strikes. Such an understanding can play a key role in helping clinicians and medical professionals address many neurological disorders. The study of the functioning of neural networks inside the brain would also provide great thrust to the research on emulating brain for digital computing.

Mr Gopalakrishnan also highlighted the serious concern of the rising number of patients with brain-related diseases in India as well as in the world. In India, more than 4 million people have some form of dementia, wherein Alzheimer's disease is the most common cause, accounting for an estimated 60 to 80 per cent of cases. Worldwide, at least 44 million people are living with dementia, making the disease a global health crisis that must be addressed. Given this alarming situation, he stressed the need to promote research on the cutting-edge domain of brain sciences in India. Being a nascent area of inquiry, India can take a lead on this and provide technological solutions to the world. Mr Gopalakrishnan lauded

the indigenous capabilities in developing COVID-19 vaccines in India in record time and stated that India can make products which are accessible and affordable to majority of the population of the world. Drawing upon this, he called for strong support and impetus to research on brain sciences in India.

He elaborated upon his efforts in promoting brain research in India through setting-up of Sudha Gopalakrishnan Brain Centre recently at IIT-Madras to power an ambitious Global Project to map the human brain at the cellular and connectivity levels, with a focus on high-resolution brain imaging. At the end, he

stressed the need to promote Start-Up ecosystem in India with adequate and long-term funding. His own venture fund, Axilor Ventures, has supported more than 200 Start-Ups so far in diverse sectors. He highlighted the key role of such an ecosystem in helping the country achieve its goal of being a 5 Trillion economy.

Endnotes

- ¹ The 42nd RIS-STIP Lecture 'Rewiring the Brain - Is it possible?' by Dr K Sridhar is available at <https://www.youtube.com/watch?v=HLj0ythEoE4>.
- ² 43rd STIP Forum Lecture by Mr. Senapathy Gopalakrishnan (Kris) is available at <https://youtu.be/hF7Lp2KQnv4>.