AVRIST WEBINAR SERIES

Innovation in India: deciphering environmental, socio-economic and technological issues

Introductory Session: The challenges facing India. January 20th, 2021

Verbatim of Jean-Luc Racine's General Introduction.
(with added subtitles)

History, Ideology, Science and Technology policies, and the Innovation debates. What is at stake for India?

This first session addresses the challenges facing India on the decisive question of science, technology and innovation. I am the coordinator of this panel - I thank you for the invitation which was extended to me - and I am also the first speaker. I have chosen to deliver in a few minutes a kind of general introduction about the historical and ideological context of the S&T policies and the innovation debate in India, and what is at stake here for India.

I. What are the stakes ?

The speeches delivered by the two ambassadors that we have heard a few minutes ago have underlined very well that, beyond the question of Indo-French cooperation in this field, the stakes are obvious for India. The point is how to upgrade the status of emerging India, and to build up what Prime Minister Modi, since he arrived in power in 2014, has called "The New India".

Let us remember that in 2019 India's GDP has overtaken both U.K. and France's respective GDP thus becoming the 5th global economic power. But at the Global Innovation Index, India is 48th, a progress from its previous ranking at 52nd. We must never forget as well—because this is one of the major stakes— that India's ranking in 2020 was 131st at the Human Development Index. Obviously, all these issues are mixed. There is a complex dialectics between science, technologies, policies, development. All the webinars will try to provide information and analysis about that.

In the present geopolitical context, China's rise has testified to the strategic significance of mastering S&T and transmuting innovation into manufacturing and services activities. In this geopolitical configuration, not just for India of course, but particularly for India, S&T and Innovation are key parameters of strategic autonomy, and key parameters of the way India needs also technology transferts for upgrading her status. So, it's a question of constanly trying to improve the innovation ecosystem at the centre of the national project, as Ambassador Ashraf undelined a few minutes ago.

II. India's S&T historical legacy

My second point will try to pay justice to a long historical legacy. India can and does present itself as one of the major civilizations in history. This definition implies that long ago, knowledge and creativity contributed to this exalted status. I have of course no time to go deep into this long history, but let us remind in a few words what we may call the Indian classical tradition, when sientific development marked Indian ancient history in medecine, pharmacopoia, mathematics, astronomy, chemistry. The emblematic name here is Aryabhata, the mathematician and astronomer of the 5th-6th century. Regularly, people in power remind us that, at the same time more or less, the Nalanda and Taxila buddhist « universities » were known beyond the confines of the Indian land, and we could list other institutions of learning in Bihar, in Bengal, in Gujarat, in Odisha, in South India. Even if they are pushed to the sidelines today, some Mughal emperors have also been patrons of sciences: Humayun, Jehangir…

Then came the shock of the European expansion**,** the result of the Renaisance process runnning, century after century, to the industrial revolution. The Macaulay's *Minute on Education*, in 1835, advocated English education for Indian elites. It was a kind of epitome of what colonialism was supposed to be. Why to teach English to those who will serve the East India Company (and later on the Bristish Raj)? Because —this is what he said, and I quote his statement— « a single shelf of a good European library was worth the whole native literature of India and Arabia ».

Two decades later, in 1857, the universities of Calcutta, Mumbai and Madras were opened. In 1930, C.V. Raman won the Nobel Prize in Physics, before becoming the first Indian director of the Indian Institute of Sciences, Bangalore.

There is of course a debate on the British legacy, the pluses and the minuses.
We have the very interesting statement of the then Prime Minister Manmohan Singh, stating in 2005 that India was now confident enough for revising her vision of the British Empire, while Shashi Tharoor, ten years later, at the Oxford Union,

pleaded for the United Kingdom paying (symbolic) reparations to its former colonies…

Then, of course, the Independence of India marked a decisive step, with the Nehruvian paradigm. S&T were of utmost importance for Jawaharlal Nehru. The Atomic Enegy Commission was established as early as 1948. The first five Indian Institutes of Technology were opened during his prime ministership, and it is also under Nehru that the Indian National Committee for Space Research was established. It will become ISRO a few years later.

Under Rajiv Gandhi, technology was the key to « prepare India to the 21st century »: such was the motto. During the Nineties, the liberalisation process has not destroyed the power of the State, particularly in science and technology, but at the same time we have seen, particularly in the field of Informatin and Communication Technology, the rise and rise and rise of the private sector, with Infosys, Wipro, TCS, etc…

Then appeared, ten or twelve years ago more or less, the concept of "Indovation", in other words, "frugal innovation" or *Jugaad*. It is remaining here, even if we heard perhaps a little less about it these days. As we shall see in the next session, the success of India in space has been remarkable, at a comparatively low cost.

III. Under Modi. The government S&T policy and Hindu nationalism

My third point will pay attention to what is happening now, under the government of Narendra Modi. We have here two different narratives. On the one hand, we have of course the multiple goverment programmes: Smart Cities, Digital India, direct benefit transfert through e-governance, e-marketplaces, etc, etc… We have a number of speches by the Prime Minister pleading for an overall policy for innovation. To students of Indian Institutes of Management he proposed the mantra of "IPPP" or "Innovate, Patent, Produce and Prosper". He renewed the statement recently, in January, in the context of the challenge raised by the Covid pandemic, requesting young Indians to play the card of innovation, and to help to turn their start-ups of today into multinational corporations of tomorrow.

So on the one hand, we hear optimistic discourses, particularly from circles close to the goverment. Let us mention here the book *The Innovation Republic,* which celebrates *« Governance Innovations in India under Narendra Modi ».*

On the other hand, we have a second narrative, linked to the Hindutva ideology. Look at the webpage of Dr Harsh Vardhan, the minister for Science and Technology and you will find this statement, just below his portrait: « *Each and*

every custom and ritual of Hinduism is steeped in science; every modern Indian achievement is a continuation of our ancient scientific achievement. »

We have heard more astonishing statements including, a few years ago, one made by the Minister of State in charge of Higher Education saying that Darwin was wrong ; others saying that Newton and Einstein were wrong as well. Unfortunatly, during sessions of the prestigious Indian Science Congress, we heard people saying that ancient Hindus invented stem cell research or plastic surgery. This is something that we should distinguish clearly from the debate about what is called « indigenous science »: I think here, for instance, about the relevance of Ayurveda.

Beyond this set of narratives, the key question is: how do you finance the science and technology policy? The research budget in India has tripled between 2008 and 2018, but despite this progress, which has been comforted in the 2020 budget, with research allocations going up by 13%, the research budget remains under 1% of the GDP, while in China it is 2,4% with a much larger GDP.

So we have here hard realities, including in the search for technology sovereignty, and the search for technological transfers: how to manage the two? This is my fourth point.

IV. The dialectics between India's global ambition and the renewed doctrine of self-reliance : *Atmanirbhar Bharat*

India has to try to solve the question raised by the dialectics between its global ambition on the one hand, and the renewed doctrine of self-reliance, that Prime Minister Modi has called *Atmanirbhar Bharat* on the other hand.

Just after arriving in power, he launched the *Make in India* policy, trying to transform India into a global manufacturing hub, involving multinational corporations and domestic companies and indeed the Foreign Direct Investments rose greatly, with very often technology transfers. We have no time here to debate upon a very significant field in that matter, which is the defence industry.
The Covid challenge has also underlined the key question of the supply chains, in India as in other countries as well.

Atmannirbhar Bharat, a self-reliant India, does not mean India closing on herself. The slogan raised by the Prime Minister was « vocal for local », but he precised: « It is time to become vocal for our local products and make them global ». This is of course easier said than done, but this is the goal.

It is in this context that we can pay attention to the Science, Technology and Innovation Policy document, published for being debated last year, as was mentioned during the welcome session. The aim is to give greater emphasis to « promoting traditional knowledge systems, developing indigenous technologies » while, in the meantime, « making the Indian Science, Technology and Innovation ecosystem globally competitive ».

Definitely, Indian attractiveness is significant. Just recently, last year, Google invested more than USD 4 billions in Jio platform, Amazon invested more than USD 2 billions in Web services, Goldman Sachs invested in Biocon Biologics, Tesla decided to open an R&D lab in Bangalore and just a couple of days ago the French major Total bought for more than USD 2 billion 20% of the shares of Adani Green Technology Ltd.

So the dialectics between building India and opening to the world is at the core of the strategy, but also at the core of current debates.

V. A glimpse at the current debates about Science, Technology and Innovation in India

I list them without detailing them, as a conclusion:
- The ideologisation of science.
- What is the impact of new technologies on individual freedoms?
- Is there something that we may call innovation nationalism? This debate has been opened when India fighting the Covid decided that one of the vaccines available, Covaxin, made in India herself, would be authorised before the full completion of the phase III testing.
- And finally there are the debates on the real socio-economic impact of the social programmes relying upon digitalisation, and how to articulate the willingness to push and push science, technology and innovation with the goal of effectively benefitting the Indian society.

Thank you for your attention.
I give now the floor to the second speaker, Dr Joël Ruet, from the CNRS.