**Lessons from China**

Atta – Ur- Rehman January 22, 2020

On 10th January 2020, a glittering function was held in The Great Hall of the People in Beijing with several thousand dignitaries. It was presided over by Chinese President Xi Jinping.

Present were also the prime minister, the deputy prime minister, other cabinet ministers and all top scientists of China. The function was held to honour top scientists of China and the world. The highest scientific award of China, the International Science and Technology Collaboration Award, was conferred on 10 foreign scientists. I was one of those chosen to receive this honour from President Xi himself, the first scientist from the Islamic world to be decorated.

The journey that led to this award started in 1974 with my first visit to China. I delivered a lecture at the Shanghai Institute of Organic Chemistry and met a science giant of China, Prof Wang Yu, who had succeeded in carrying out the first synthesis of insulin, in the face of fierce US competition. Over the years we have developed collaborations with China in many fields. These include AI with the Shenzhen Institute of Advanced Technologies and Guandong University, Hybrid Rice Seed Production with the China National Rice Research Institute, and Virology with the Wuhan Institute of Virology.

These collaborations have led to many joint discoveries including an exciting Chinese herbal drug which was tested at the International Center for Chemical and Biological Sciences at the University of Karachi for its activity against Chronic Obstructive Pulmonary Disease (COPD) and found to be as effective as ampicillin. It will soon be marketed in Pakistan.

This was not my first meeting with President Xi of China. In 2017, I was formally inducted by him in the same space as an Academician of the Chinese Academy of Sciences, a unique honour, and in 2014 I received the highest award of China for foreigners, the Friendship Award from him.

Another humbling experience was the inauguration of a six-storey research building in my name on October 24, 2019 at a special function that corresponded with a huge international conference at the Hunan University of Chinese Medicine in Changsha. The research centre was named the ‘Academician Professor Atta-ur-Rahman One Belt and One Road Traditional Chinese Medicine (TCM) Research Center’. The function in China was attended by our Federal Minister of Science and Technology Fawad Hussain Chaudhry.

My linkages with China over the last 45 years have given me an opportunity to study the developments in China in some depth. The reforms in science institutions were three pronged. First, the funding system to science institutions was reformed and scientists were forced to carry out contract research for private enterprises, offer consultancy services and undertake entrepreneurial activities so that science had an impact on society.

Applied research was encouraged through incentives such as licensing of technology developed by institutions, establishing onsite manufacturing operations and creating technology based spinoffs. Public funding was directed towards basic research only in strategic high-technology industries.

Second, emphasis was given to proper R&D management. The improvements included measures such as decentralization of decision-making, change in the evaluation criteria for measuring efficiency, fostering competition among organizations and diversifying their activities.

The third prong was to establish efficient linkages. Public-sector funding was offered to manufacturing industries for supporting R&D and for providing strong technical assistance from universities and research institutions.

The vision to use science and technology as engines for socio-economic development was reflected in funding allocations. China has now overtaken the US in terms of R&D expenditure. While R&D spending in the US grew only by 4.3 percent annually from 2000 to 2017, it grew by more than 17 percent annually in China during the same period. According to a report in the world’s leading science journal ‘Nature’ earlier this month: “The United States accounted for 25 percent of the US$2.2 trillion spent on R&D worldwide in 2017, and China made up 23 percent. Preliminary data from 2019 suggest that China has already surpassed the United States in R&D spending”.

The remarkable GDP growth rate of 8-11 percent of China has been based on the massive investments made in the development of highly skilled manpower. China is sending about 600,000 students to top universities of the world each year and about 500,0000 are now returning after PhDs or postdoctoral training each year and joining the workforce. The result is a mind-boggling rate of progress of China, particularly in the new and disruptive technologies that are predicted to have a global impact of over 100 trillion US dollars over the next ten years.

We must start a similar programme to send at least 10,000 students annually to top universities of the world. There must be jobs in universities and R&D institutes on their return. We must offer excellent salaries, research funding and infrastructure to attract them back as was done by us from 2002 to 2008. This will allow us to develop top centres of excellence in emerging technologies that can lay the foundations of the high-tech industry in Pakistan.

The path adopted by China has many lessons for us. Nations are not built by just building roads or houses. It is only through education, science, technology and innovation that we can march forward. Our single focus should be to manufacture and export high technology products. Science Minister Fawad Chaudhry and I met China’s Minister of Science and Technology Wang Zhigang on October 21, 2019.

My proposal that a joint China-Pakistan Committee be set up for the manufacture and export of high-technology products involving Chinese and Pakistani industries was enthusiastically accepted. The Chinese minister immediately nominated his member of the committee. This could be a game-changer for Pakistan if we can persuade leading Chinese industries to establish manufacturing operations in Pakistan under the CPEC initiative.

The snowball effect could change the fate of the country as CPEC could be the venue of the production and export of engineering goods, electronics, automobiles, aircraft, pharmaceuticals, industrial alloys, pharmaceuticals etc. To achieve this objective we must do whatever it takes. This should include offer of free land to joint manufacturing units, 50 percent discount on electricity and gas rates, a 15-year tax holiday, and insurance against disruption of industrial production due to the law and order situation.

Our prime minister and our Minister of Planning should carefully consider these suggestions. The path to socio-economic development lies only in education, science, technology and innovation and there are many lessons in this respect that we can learn from China.

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