[Atta-ur-Rahman](https://www.thenews.com.pk/writer/atta-ur-rahman)

December 16, 2020

**A future of knowledge**

Pakistan’s future lies in developing a strong knowledge economy based on excellence in education, science, technology and innovation/entrepreneurship so that we can migrate from the traps of a low value agricultural economy to a strong ‘Knowledge Economy’.

A knowledge economy requires the production of goods and services to be based on knowledge-intensive activities, utilising the remarkable advancements in technical and scientific innovations. We need to develop a highly skilled workforce and introduce policies to utilise this work force towards setting up major industries for the manufacture and export of high technology products. That is the secret of the rapid developments of countries such as Singapore, Korea and China.

Pakistan, alas, has focused on manufacture and export of low-value textiles and production of low-value agricultural produce, which has relegated us to the bottom of the ladder in terms of per capita income. In a knowledge economy, excellent technical skills are needed with abilities to solve complex problems, work in interdisciplinary areas and adapt swiftly to the rapid changes that are occurring in almost every field. Such skills are of particular importance in the new digital age in which artificial intelligence as well as the Internet of Things (IoT) are rapidly changing the manner in which businesses are being managed.

A knowledge economy requires four main pillars. The first is the availability of an educated and skilled workforce. The workers must be well trained in their respective fields and have the ability to solve problems and adapt their skills to the new challenges that arise.

The second pillar is access to modern information and communication technology resources so that the latest information and new developments can be rapidly accessed and effectively utilised. The third pillar is an effective innovation system within the firms and industries as well as in the country so that intellectual property is protected and mechanisms exist to rapidly transform good ideas to innovative products and processes. The fourth related pillar is the existence of national eco-systems in which innovation can flourish. This requires good leadership, federal ministers and secretaries with a deep understanding of how such a transformation to a knowledge economy can be brought about so that an enabling eco system can be created. Such an ecosystem would require the promotion of technology parks, angel investments, venture capital, special technology zones, business incubators and tax incentives for promotion of a high-tech industry.

A good beginning to develop a strong knowledge economy was made under Gen Musharraf when as federal science minister in 2000, I persuaded him to invest massively in science and education. Later, as chairman of the HEC during 2002-2008, huge changes occurred that were appreciated by many international agencies including the UN. The programmes of the HEC were reviewed by Prof Michael Rode, chairman of the United Nations Commission on Science, Technology and Development. He visited Pakistan several times and wrote in 2008: "Around the world when we discuss the status of higher education in different countries, there is unanimity of opinion that the developing country that has made the most rapid progress internationally in recent years is Pakistan. In no other country has the higher education sector seen such spectacular positive developments as that….”.

A USAID Report published after a thorough assessment of the HEC programmes observed: "One of the most striking aspects of [the] HEC since its inception is the emphasis on excellence and high quality in every sphere of its activities…".

‘Nature’, the world’s leading science journal, wrote four editorials applauding the steps taken by Pakistan in this sector. The world’s most prestigious scientific society, The Royal Society (London) published a book entitled ‘A New Golden Age’ in which it described Pakistan as the best-practice model to be followed by other developing countries.

There was a 60-fold increase in the development budget of the Ministry of S&T during my tenure as federal minister of science and technology during 2000-2002. Similarly, there was a 24-fold increase in the development budget of the HEC during 2002-2008. We introduced dramatic changes in the salary structures of scientists. Under a new tenure track system, the salaries of professors were increased to over $5,000 a month, five times more than those of Federal Ministers. The grades of university faculty members were increased and 75 per cent tax waiver also given to university teachers. An investment of about $1 billion was made for PhD level scholarships for Pakistani students in leading universities for faculty development and about 11,000 foreign scholarships awarded. Each returning scholar was given up to a $100,000 research fund with a guaranteed job. A digital library was established with free access to 65,000 textbooks and 25,000 international journals with back volumes. The culture of plagiarism came to a grinding halt as software was introduced to check all research papers and theses.

These and other measures led to a huge change in research output from universities in Pakistan so much so that while we were 400 percent behind India in terms of research publications in international journals per capita in the year 2000, we overtook India in the year 2017, and by 2019 we were about 25 percent ahead of India, no mean achievement. My colleagues Dr Akram Sheikh and Dr Sohail Naqvi played a critically important role in the transformation.

With the present government setting up a Task Force on Knowledge Economy chaired by the PM himself, of which I am vice-chairman, the journey towards migrating to a knowledge economy has begun again. The Pak Austrian Fachhochschule, University of Applied Science and Engineering in Haripur Hazara began functioning last month as a result of our efforts during the last three years, thanks to the vision and support of Prime Minister Imran Khan. Another university will soon be established in Sialkot again under my supervision. At last, Pakistan is back on track towards building a strong knowledge economy.

The writer is the former chairman of the HEC, and president of the Network of Academies of Science of OIC Countries (NASIC).

Email: ibne\_sina@hotmail.com