**Science-Based Economy: The Only Way Out**

[Dr Muhammad Nauman Kakakhail](https://dailytimes.com.pk/writer/dr-muhammad-nauman-kakakhail/)

December 7, 2022

The materials-science-based classification of human civilisations is a manifestation of the crucial role of science, especially materials science. We started from the stone age, went through the iron and bronze ages, and are now living in the silicon age. We are on the cusp of a new age, which is full of wonders. Science communities already have certain predictions of the next era of human civilisation based on scientific breakthroughs in the twenty-first century.

Science, and specifically basic science, is the generation of new knowledge. Basic science is based on the quest for curiosity that searches for unanswered questions in nature. Most of the time, these discoveries lead to huge breakthroughs and result in a mega transformation in the life of mankind. This curiosity-driven research has a cent per cent probability of success and the outcomes are much more fruitful than one could imagine. The quest for understanding the particles and related knowledge in 1897 by J J Thomson resulted in the discovery of electrons. This discovery was not a headline in newspapers at that time, but currently, more than 50 per cent of the world economy is based on this understanding of electrons and related knowledge in the shape of cars, engines, electricity, heavy machinery, and all electronic types of equipment that uses electron as a primary actor.

A key factor in the scientific excellence of the science-based countries is the scientific thought process.

We have many examples in front of us where science was given priority in certain countries, which resulted in a magical transformation in their economic, political, and overall situation. For example, Israel bought a computer for two million dollars during the 1960s, when they couldn’t afford to buy meat and the citizens used to get only 100 grams of meat from the government. But their priority for research was crystal clear from their actions and policies. It took them just a few decades, and now, they are the leaders in the discovery and production of many life-saving drugs, allopathic medicines, agriculture, the IT industry, the business sector, and many more, thanks to their seriousness for science and technology. Another key factor in the scientific excellence of these science-based countries is the scientific thought process. They do not confine science only to Physics, Chemistry, Biology, or mathematics, but rather see it as a broad term that encompasses almost every sector of life. It pertains to the scientific thinking of each individual in the country. In the past, human resources and manpower used to be considered important factors in the economic situation of a country, but this age demands smarter brains rather than the availability of helping hands.

The statistics reveal that the population or natural resources are no more the key and decisive factors in the economy of a country. Singapore has a population of five million people and lacks any kind of natural resources, whereas Pakistan has a population of 260 million and shares nearly the same situation in terms of natural resources. There is an astonishingly huge difference in the annual GDP per capita of Singapore and Pakistan, which is 73000 USD and 1500 USD, respectively. Similarly, Iran and Venezuela have big oil resources, but the annual sale of Apple company in the US is more than the annual sale of oil of the above-mentioned two countries collectively. These indicators speak volumes of the importance of science and technology. All the above representative examples are the bye product of science, but it offers more than what has been mentioned above. Apart from the physical scientific product, it provides a brain pool of smart people who are an asset in making this transformation a chain reaction by establishing new companies and science-based firms via entrepreneurship or advising other research institutes in the field of science and technology. These smart trained minds help youth via knowledge and skills dissemination and prepare scientists for the future of a sustainable science-based economy.

Keeping this in view, our system requires complete transformations rather than a few reforms in the education and research sector. We have examples in front of us, but they require only the seriousness and commitment of government and society. Advancement in science and technology is the only way out of this crisis in the country and to gain economic stability, dignity, global importance, and international impact while other political slogans in no less than flogging the horse of key to advancement in an arbitrary direction.

*The writer is a physicist by profession. He is working as an ESPRIT Fellow at the Institute of Science and Technology Austria and visiting scientist at the Los Alamos National Laboratory, US.*