UNIT 63 – UPSC - Science and Technology

Science and Technology have been a vital exploration in Indian culture since ancient time. The importance on science and technology on human spiritual values leading to the identification of science and technology to that of the past 300 years, the era of Enlightenment and Industrialization of the Western Civilisation. In India, The tradition of science and technology is over 5,000 years old. A resurgence was observed in the first half of the 20th century. The vibrant role of science in modern life is not exaggerated in view of world presently. Science and technology have deeply influenced the progression of human civilization. Science has provided people extraordinary insights into the world they live in. The scientific uprisings of the 20th century have led to numerous technologies, which promise to herald wholly new periods in many fields. In this millennium, people have to guarantee total use of these developments for the wellbeing of people.

It is well recognized that for any positive economy, particularly in today's quest for knowledge based economies, science, technology and engineering are the basic requisites. If nations do not implement science and technology, then it could be even rated as an undeveloped nation. Science and Technology is related in all means with modernism and it is an essential device for speedy development.

Many scientist around the globe are aware that India was the source of important foundational scientific developments and approaches. These include many great scientific discoveries and technological achievements in Mathematics, Astronomy, Architecture, Chemistry, Metallurgy, Medicine, Natural Philosophy and other areas. Majority of these developments travelled outwards from India. It is estimated by the World Bank that seven of the ten largest economies of the world by 2020 would be in Asia like China, Japan, India, Thailand, Indonesia, South Korea, and Taiwan. A few decades ago, these countries were considered as poor policies, low discipline and no advancement. With the introduction of science and technology in an effective manner, they have made waves across the globe.

Equally, India also integrated scientific ideas and techniques from elsewhere, with open-mindedness and a rational approach, characteristic of a scientific ethos. India's traditions have

been founded on the principles of universal concord, respect for all creations and an integrated holistic approach. This background is likely to provide valuable perceptions for future scientific developments. Before independence, there was a weakening of modem science in India through contribution of a numerous exceptional scientists. They were responsible for great scientific progresses of the highest international capability.

Science:

The dominant tenacity of science is to elucidate the natural world through iterative intellectual and exploratory practices that involve observations and controlled manipulations of that world. With this concept, science can be argued in terms of a 'critical realist' stance. This reflects a view that 'things' exist in the world and 'are as they are' (Lopez and Potter, 2001). As such, the role of scientists is to debrief the 'real things' of the natural world in order to construct explanations of them. With the view of science as a human activity, resulting explanatory texts are entrenched in the sociocultural world and as such will be human-mediated representations of the 'real things'. Scientific knowledge is that which has 'real things' as its referent. For new knowledge to be authenticated within the domain of science, this knowledge must adhere to logical reasoning and be internally coherent within the dominant model. On the other hand, Science must provide considerable challenge to the paradigm, while still operating within the tolerance levels of the broader domain. It must withstand peer review in order to be represented as a 'truth'. Truth is not viewed as an absolute within science. Rather scientific 'truths' are, in keeping with pragmatic theory, that knowledge that gains the agreement of specialists within the domain. In contrast to conventional views of the existence of a scientific technique, modern views of scientific methodologies include an understanding of their diversity and flexibility to meet the task at hand.

Technology:

Technology is buzz word in global climate. Technology, a word with Greek origins, is defined as, "the practical application of knowledge especially in a particular area". Technology is a word used to collectively describe or portray the advancements, abilities, creations, undertakings, views, and knowledge of a singular group of persons, we as human-kind. The aim of technology is to interfere in the world to produce something new to that which currently exists. It accomplishes this process through iterative intellectual and design-based practices that involve multiple sources of input. These input sources include a mixture of that defined as natural, material, simulated, conceptual, emotional, and imagined.

Technologists also draw from the past, current and a range of possible and probable futures. The attitude that has been argued as best supporting an understanding of the domain of technology, is that of a 'process ontology'. This standpoint challenges the critical realist notion that 'things' exist as such, and instead argues that 'processes' are what exist, and it is our interaction in process which allows the opportunity to categorise, and thus objectify, 'things as such' (Neuman, 2003). Consequently, from technological perspective, people are both creators of the material world of technology in clear and tangible ways, and also symbolic creators of the 'natural' world. Technological knowledge does not attempt to make claims to 'truth' in the same way as scientific knowledge does. Instead it has as its referent, the process of function.

Technological knowledge validates 'success' not 'truth'. However, like science, the 'success' of technological knowledge is determined within technological practice by professionals within the domain of technology. Technological practices are situation specific, and therefore are as diverse

and varied as the environments and people involved in the endeavour. The advanced technology improves industry by making it more effective and, what is vital today, safer for environment.

It is appraised that there is major contribution of science and technology in improving the life conditions across the globe but the benefit has to been harvested maximum by all countries. Science and technology has made life simpler and made healthy living with the progression of medicines and analysis on diseases. Apart from the medical side, there has been extraordinary development in education, communication, agriculture, industry etc. The global economic output has increased 17 folds in the 20th century. In spite of the advancements in almost all sectors, still the world is not free from hunger, disease, pollution, illiteracy and poverty. The gap between the rich and the poor has widened. By the 21st century, with the right applications of research, development, and implications of science and technology a major difference could be brought about. It can be said that a nation's development and wealth is judged to a large extent by the status of science and technology of that nation. A scientifically unworldly society means an underdeveloped nation in all sectors. It is well understood that when analysing that countries like Japan and USA who deeply involved in research and development are in the highest stratum of development whereas countries like Nepal who invest very less amount in research and development remain in the lowest ranking of growth.

To recap, Science and technology are significant drivers to growth, because technological and scientific revolutions support economic advances, improvements in health systems, education and infrastructure.