LESSON 3.0 – SCIENCE and TECHNOLOGY in NATION BUILDING

3.1 The Role of S&T in Nation Building – with the significant variables qualifying S&T in Nation Building

The advent of science and technology brought progress not only in our country but in the entire world. Its development largely determines the socio-economic progress of a country. It is a well-known fact that it is directly associated with modernity and is an essential tool for rapid development and progress of a country:
Science and technology are a field of endeavor upon which a two-way interaction operates between the two.

While **science** is the **intellectual and practical activity** encompassing the systematic study of the structure and behavior of the physical and natural world through observation and experiment (Oxford Advanced Learners' Dictionary, 11 Edition), **technology** is the **application of scientific knowledge for practical purposes** (Oxford). It is the use of resources made available by nature to procreate and make changes.

National development at any phase is always linked with technology and technology happens when there is advancement in science. Modernization in every aspect of life is the greatest example of the implementation of science and technology in every nation.

With introduction of modern gadgets in every walk of life, life has become simple, and this is possible only because of implementing science and technology together. Without having modem equipment in all sectors, be it in medicine, infrastructure, aviation electricity, information technology or any other field, the advancement, and benefits that we face today would not have been possible. The role that science and technology has played in improving the life of people across the globe is vivid and has made life a lot easier and a lot better with the advancement in medicine, remarkable development in education, communication, agriculture, business, and industry.

A nation's development and prosperity are judged largely by the status of science and technology of that nation. **Science and technology** are key drivers to development because technological and scientific revolutions underpin economic advances, improvement in health systems, education, and infrastructure.

Today, countries are classified as developed and developing countries. The **major categorization** is based on the **economy and the application of science and technology.** Countries which have a strong base in science and technology are the ones that developed faster. A few examples are countries like Japan, Russia, Brazil, China, and many more. It is estimated by the World Bank that seven of the ten largest economies of the world by 2020 would be in Asia: China, Japan, India, Thailand, South Korea, and Taiwan. A few decades ago, these countries were known to have poor policies, low discipline, and no advancement. But with the introduction and proper Implementation of science and technology in an effective manner, they made great advancements across the globe.

Science and technology hold the key to the progress and development of any nation. Technology plays a fundamental role in wealth creation, improvement in the quality of life and real economic growth and transformation in any society.

A nation who is not able to prosper in these aspects would never be able to sustain its life and may have to depend on other nations. Without proper implementation of science and technology, no nation could grow and all those nations that were labeled as low in growth have proven where they stand today and all that happened because of science and technology.

B. Importance of S&T on Personal Level

Today, we cannot expect our life without science and technology revolving around it every single second. Science and technology are extremely essential in our everyday life as they have made things more simple, fast, and secured.

Almost everything that we see around us is the gift of science and technology Be it the smartphones, fan, wheel, vehicles, cloth, paper, toothbrush, electricity, microwave, vehicles, radio, television, laptops, etc. Everything is the result of science and technology.

Here are What Science and Technology do for us:

1. **It helps us save time and money.** Various contributions of science and technology have helped us save time and money. While science has given us the knowledge because baked or steam-cooked food is better than the fried or oily food, technology has gifted us with microwave and steam-cookers that help us bake and steam cook

our food. Various objects like computers, modes of transport, washing machines help us save time and energy.

2. **Education.** Science and technology have made significant contribution in the education field as well. Technology has made education itself easier. It has provided us options like smart classes, multimedia devices, e-libraries, e-books, etc.

3. **Internet.** Information technology, including internet, is an excellent gift of technology. With the help of internet, we do not get only immense knowledge on science and other subjects, but we also get to stay connected with our friends and family.

4. **Provides us devices for comfortable sleeping, quick cooking, and fast commute.** With the help of objects like AC microwave and vehicles, science and technology have made our sleeping, cooking, and commuting process easier and faster.

5. **It helps us live better life.** While science has made significant contributions in health by providing treatment for various chronic diseases, technology has benefited us in receiving those treatments through various ways and devices like X-ray, scan machines, operation devices, pacemaker, and many more. We are also blessed with numerous exercising equipment, various health apps, online doctor and other things that help us maintain good health and life.

Impact of Technology on Society

Technology by itself is not harmful to society, but the way society uses technology to achieve specific goals is what results into negative impacts of technology on the society. Humans need to use energy to process products in factories, to run cars, to light homes and run technological machines like computers. But the only way we can do this without affecting the environment and society is by shifting from exhaustible energy sources to renewable and inexhaustible energy sources like solar/wind energy (https:/www.use-of- technology/com/society-impact-tech-society/

Technology has contributed much to various aspects of life and the following are some of its examples:

- **Technology has improved transportation**. Transportation is one of the basic areas of technological activity. Both society and businesses have benefited from the new transportation methods. Transportation provides mobility for people and goods. Transportation, like other technologies, can be viewed as a system. It is a series of parts that are interrelated. These parts all work together to meet a certain goal. Technology has made possible all types of transportation, and these Include: (1) road transport used by automobiles; (2) air transport which is used by airplanes: (3) water transportation.
  which is used by ships and speedboats; and (4) space transportation used to go to the moon. Technologies like automobiles, buses and trucks have improved the way humans move and how they transport their goods from one place to another.

- **Technology has improved communication.** Communication is used for a few purposes. Both society and organizations depend on communication to transfer information. People use technology to communicate with each other. Electronic media like radios, televisions, internet, and social media have improved the way we exchange ideas which can develop our societies. In many countries, radios and televisions are used to voice concerns of society. They organize live forums where the community can contribute through mobile phones or text service systems like tweeter. Communication technologies like televisions, radio and internet are used to persuade, entertain and inform the people about the various program the government. Small businesses have also used the internet and mobile communication technology to grow and improve their business.

- **The World Wide Web has proved to be an enormous information base** from which information can be retrieved by means of search engines. Information from all around the world is housed on the web. With the development of web technology, the information can be organized in an organized manner and relevant information can be retrieved on supplying search strings to Web search engines. Digitization of information has been a major breakthrough in the world of information technology.

- **Technology has improved education and the learning process.** Education is the backbone of every economy. People need well and organized educational

infrastructures so that they can learn how to interpret information. Many schools have integrated educational technologies in their schools with the aim of improving the way students learn. Technologies like smart whiteboards, computers, mobile phones, iPads, projectors, and internet are being used in classrooms to boost students' morale to learn.

In the past, when there was no technological advancement, education was usually difficult to access and comprehend. Today, people can get educated even at their doorsteps without going to a building called university or college to collect their certificates. Distant learning and on-line study have made this possible.

The Role of Science and Technology in Nation-Building

It is a well-established fact that science and technology impact all aspects of our lives as well as the planet we live on. The changes induced by science and technology have for the most part benefited mankind although there is many a case where science and technology-based innovations have been used for the detriment of mankind pursued for either wealth and power or both. It is the responsibility of all concerned to ensure that science and technology is used widely to benefit mankind (Ratnasiri, 2006).

Science and technology have been one of the main driving forces of the economic growth of nations. Most developed countries have generated new technologies with potential to result in dynamic economic performance. This, however, has not been the case with most of the developing countries and their developmental plans have not given emphasis and importance to science and technology and in particular to research in the science and technology aspects. Countries like India, South Korea, and Taiwan in the region have achieved much through science and technology and stand out as having demonstrated the absolute importance of science and technology for economic growth. These countries are example for the developing countries. The impact of technology on society without doubt is going to be even more marked in the future.

It is then of paramount importance to generate and develop new knowledge in science and technology for application nationally through our own research capability. It is also necessary to concentrate on the rapid transfer and exchange of proven technologies from other nations to reap the benefits of the global trends to stimulate our economic growth.

That science and technology plays a decisive role in the economic growth of nations is a foregone conclusion. It is then pertinent to also consider and rethink about the role of scientists and technologists in stimulating the economic well-being of the country. It is well accepted that scientists and technologists must necessarily generate new knowledge by engaging in meaningful and appropriate research and developmental activities. A question needs to be posed to the researchers as to whether their role should be limited to only the narrow confines of creation of new knowledge. If scientists and technologists are to contribute significantly to social and economic changes resulting in the development of the country, their role should expand beyond generation of new knowledge and assume the role of advising the decision makers and finally making the decisions on the science and technology prospects, choices, and priorities for the country.
How can scientists and technologists contribute to achieving the multiple role which is a dire necessity for the economic development of the country?

Researchers, as creators of new knowledge, must focus their work on nationally and globally important and competitive areas of research which are multidisciplinary in nature. This means that the results of research must be goal and result-oriented, tangible and significant. On the other hand, scientists and technologists should be totally committed to add and develop significantly to the knowledge base in science and technology aspects which are of economic importance to the nation.

The Role of Science and Technology in the Developing World in the 21" Century

Developments in science and technology are fundamentally altering the way people live, connect, communicate, and transact, with profound effects on economic development. According to Lee Roy Chetty (2012), science and technology are key drivers to development, because scientific and technological revolutions underpin economic advances, improvements in health systems, education, and infrastructure. The technological revolutions of the 21" century are emerging from entirely new sectors, based on micro-processors, telecommunications, biotechnology, and nanotechnology. Products are transforming business practices across the economy, as well as the lives of all who have access to their effects. The most remarkable

breakthroughs will come from the interaction of insights and applications arising when these technologies converge.

Through breakthroughs in health services and education, these technologies have the power to improve the lives of poor people in developing countries. Eradicating malaria and cures for other diseases which are endemic in developing countries are now possible, allowing people with debilitating conditions to live healthy and productive lives.

The extent to which developing economies emerge as economic powerhouses depends on their ability to grasp and apply insights from science and technology and use them creatively. Innovation is the primary driver of technological growth and drives higher living standards.

To promote technological advances, developing countries should invest in quality education for youth, continuous skills training for workers and managers, and should ensure that knowledge is shared as widely as possible across society.

The state of science and technology determines the socio-economic progress of a country. It is a well-known fact that national progress is highly correlated to the capacity of a country to produce local industrial goods for domestic needs and that industrialization is very much dependent on the application of science and technology.