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Dr.K.Sasi Kumar

Editor-in-Chief

SUSTAINABLE ECONOMIC DEVELOPMENT - INDIAN PERSPECTIVE

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SUSTAINABLE ECONOMIC DEVELOPMENT - INDIAN PERSPECTIVE

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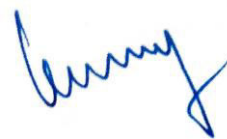
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EDITORIAL MESSAGE

We take great pleasure in welcoming you to our Edited Book. The immediacy of e-based publication makes it possible for us all to be fully connected to each other and to developments in our field and to be directly involved in ongoing knowledge construction.

With several economies gearing towards the end of lockdowns, it's time for organizations to implement Post-COVID-19 business recovery strategies. Although it will let organizations restore balance to an extent, total recovery from the crisis is going to be a long and strategic battle. With these concepts in mind, we invited with scholarly discussions to facilitate new ideas for business sectors. This book also stands as a platform for Students and research scholars to express their innovative business models and solutions.

We are thankful to all academicians, research scholars and students who have contributed for this edited book. We also acknowledge the valuable suggestions and support offered by our colleagues and students. We are delighted that you are joining us as readers and hope you will also join us as contributors.



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SUSTAINABLE DEVELOPMENT OF ECONOMICAL GROWTH IN ELECTRONICS

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INTRODUCTION

Sustainable Development is an interdisciplinary concept, including the environmental, Health, Energy, Economic and Socio-Cultural areas. India constitution envisages specific provisions for the protection and improvement of environment. India also has credit to be first country which made provisions for the protection and improvement of environment in its constitution. However, it plays a significant role in creating climate change policies, the development of cleaner energy sources and the development of technical developments. Physicists have a crucial role to play in this work and are responsible for innovations ranging from low-energy computing to breakthroughs in solar and wind power and the battery technology which is needed to store energy drawn from new sources. Without Physics we wouldn't have many of the things today, including transport, construction and telecommunication or some of the most vital advances in health care such as MRI Scanners.

Economic importance in Physics

Physics makes a significant economic contribution across all sectors, drives growth and creates highly skilled jobs resulting in long-term economic growth and prosperity. It generates fundamental knowledge needed for the future technological advances that will continue to drive the economic engines of the world and contribute to the technological infrastructure and to skills needed to take advantage of scientific advances and discoveries. Physics improves our quality of life by providing the basic understanding necessary for developing new instrumentation and techniques for medical applications. Such as computer tomography, magnetic resonance imaging, positron emission tomography, ultrasonic imaging and laser surgery.

Significance in Electronic Industry

Today, India is in a position to offer cost effective, great quality, high reliability and speedy deliveries. It also provides the application of the state-of-art technologies in the software industry. The electronics industry in India started *with radio manufacturing in the 1850s*. The setting up of the *Indian Telephone Industry (ITI) in 1950* at Bangalore gave a boost to this industry. It now meets the needs of post and telegraph, defence, railways, electricity boards, etc. ITI now has the main manufacturing units located at Bangalore, Naini, Rai Bareilly, Mankapur, Palakkad and Srinagar.

Bharat Electronics Ltd. (BEL) was set up at Bangalore in 1956, to fulfill the needs of the defence services, All India Radio and the meteorological department. Its main centres of production are located at Bangalore, Ghaziabad, Pune, Panchkula, Chennai, Hyderabad, Kotdwar, Machilipatnam and Talaja. BEL also exports a variety of equipments to Asian and European countries.

The Indian electronics industry is also helping the development and growth of space technology. India produced electronic goods worth more than 70,000 crores in 2001-02. Bangalore is the largest centre of electronics goods production, and is rightly called the 'Electronic Capital of India.' It is expected that the software exports would account for about half of the total foreign exchange earnings of India.

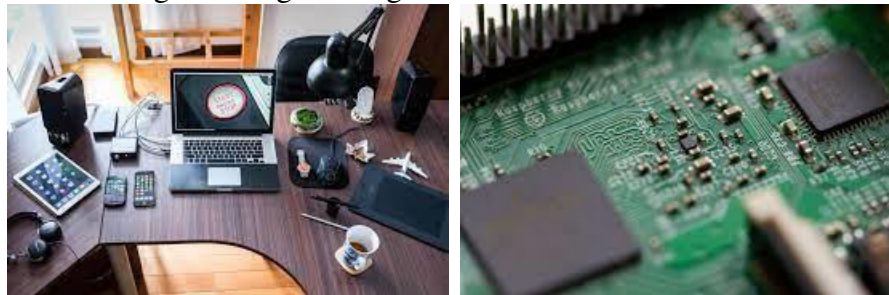


Fig1. Electronics Industry

Sustainable ICT will enable us to protect and enhance human health and well-being and the environment over generations while minimizing the adverse life-cycle impacts of devices, infrastructure and services.” Electronics contain many chemicals that are known to cause issues with human health. The favourable materials used in green electronics are aluminium, borosilicate glass, iron alloy, graphene and biomaterials. Aluminium is known as the ‘green metal’ and the best eco metal due to the fact it has a virtually infinite lifespan. It can be recycled repeatedly without losing any quality. The importance of electronic industry is that it has largely contributed to space technology, communication, information

technology and software Industry. Indian software is in great demand in the world. ii) It has helped medical sciences and defence to develop with electronic apparatus.

1. Design for environment and circularity.
2. Sustainable choices of raw materials.
3. Energy-efficient and material-efficient manufacturing techniques.
4. Sustainability for the use phase.
5. End-of-life management for circular economy.

Renewable energy sources include wind power, solar power, bioenergy (organic matter burned as a fuel) and hydroelectric, including tidal energy.

Wind Power:

Wind power or wind energy is mostly the use of wind turbines to generate electricity. Wind power is a popular, sustainable, renewable energy source that has a much smaller impact on the environment than burning fossil fuels. Historically, wind power has been used in sails, windmills and wind pumps but today it is mostly used to generate electricity. Wind farms consist of many individual wind turbines, which are connected to the electric power transmission network.

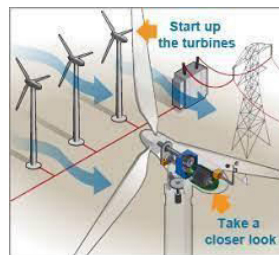


Fig2. Wind Power

Solar Power

Solar power works by converting energy from the sun into power. There are two forms of energy generated from the sun for our use: electricity and heat. Both are generated through the use of solar panels, which range in size from residential rooftops to 'solar farms' stretching over acres of rural land.



Fig3. Solar Power

Bioenergy

Bioenergy is one of many diverse resources available to help meet our demand for energy. It is a form of renewable energy that is derived from recently living organic materials known as biomass, which can be used to produce transportation fuels, heat, electricity, and products.



Fig 4. Bioenergy

Hydroelectric energy

Hydroelectric energy, also called hydroelectric power or hydroelectricity, is a form of energy that harnesses the power of water in motion such as water flowing over a waterfall to generate electricity.

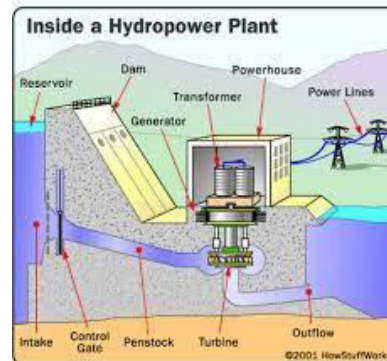


Fig5. Hydroelectric energy

Impact of electronics in industry

Advances in the field of electronics have also played a key role in the development of space technology and satellite communications, inaugurated a revolution in the computer industry that led to the introduction of the personal computer. The environmental impact of electronics manufacturing is a global ecological issue, which is not just limited to the creation of rubbish. It raises concerns about air pollution, water and soil contamination, privacy concerns and even worker exploitation.

Role of Physics in Environment

It is essential for understanding the deep structure of earth and the natural phenomena that affect Earth's surface such as earthquakes and volcanic eruptions. Nuclear power (both nuclear fission and fusion) and renewable energy (including wind, hydropower, photovoltaic cells and solar thermal energy). Electronics produced through environmentally-friendly processes are green electronics. They take into account the consumption of energy and production of carbon. Made out of recycled materials, green electronics reduce the consumption of vital natural resources. Research and development efforts on all of these alternative technologies are under way around the world. The weather and climate are driven by the absorption of solar radiation and the subsequent re-distribution of that energy through radiative, advective and hydrological processes. Although electricity is a clean and relatively safe form of energy when it is used, the generation and transmission of electricity affects the environment. Nearly all types of electric power plants have an effect on the environment, but some power plants have larger effects than others.

Future of electronics in India:

A new kind of electronic architecture called the memristor is paving the way for what might be next in electronics Neuromorphic Computing. It promises a new way to compute that is fast, energy efficient and allows to build truly intelligent hardware. The electronics sector has the potential to become one of the top exports of India in the next 3-5 years. Electronics exports may occur for significant contributions to the Indian economy in terms of foreign exchange earnings and employment generation.

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