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AN ECONOMIC PERSPECTIVE ON THE BIOTECH REVOLUTION

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ABSTRACT

In recent years we are witnessing the change in Social and economic activities of production, distribution and consumption pattern changes due to various health issues due to Covid. In an economy population growth is a big problem on one side so the government is taking necessary steps to reduce the population growth. On the other hand new diseases affect the lifespan of the people while at the same time new technologies are found in lifesaving activities. In India after 1980 the government formed a biotechnology department to enrich research and development. The objective of the study is to find the benefit of biotechnology in the economy and to gain insight into the benefits of biotechnology in agriculture, marine and environment.

Keywords: *Health issues, Covid, population growth, biotechnology, agriculture, marine and environment.*

1. INTRODUCTION

With the advent of COVID 19 Social and economic activities of production, distribution and consumption pattern change a lot, also it hits a lot on all sectors of the economy and economic activities but few sectors focused and popularized among all section of the people one of such sector is biotechnology and biotech related sectors, apart from Covid, population growth is big trouble in the economy. The study of scarcity and choice are basic economics, with the limited resources in the life saving requirements we are in need of advancement and new ideas to meet for coming demand in health, agricultural and bio-sciences.

Today we see amazing discoveries, new applications and innovative products on the market every day. Biotechnology has emerged as one of the most popular fields among youngsters who want to explore the modern aspects of science. The demand and innovations in the field of bio-sciences is high in industrial sectors like food, textiles, pharmaceutical, agriculture, animal husbandry etc. objective of this study is to find at what extend bio-technology is helpful to meet the needs of health, agricultural and bio-sciences and to insight the economic perspective on the biotech revolt.

Biotechnology diligence is one of the fastest growing knowledge-based industries in global and India. It also has the ability to show an important role in the rapid economic development of the country. Due to several advantages that the country has such as skills, knowledge, research and development (R&D) facilities and cost efficiency, a number of top biotech establishments have in progress their operations in this country. With proportional advantages and the occurrence of some top corporations in the market,

India has got the possibility to come out as one of the key players in the global biotech sector. It is supposed that both the population and the ecology of India have played a major role in the development of the industry. These dual benefits have precisely donated in field such as drug discovery and research. Our Indian government is also contribution full support to the biotech sector by facilitating financial assistance and non-financial support at both the central level and state level.

THE ECONOMIC CONTRIBUTION OF BIOTECHNOLOGY INDUSTRY IN INDIAN ECONOMY

Thomas Robert Malthus, a famous British economist, in his book ‘An Essay on the Principle of Population – 1798’ theorized that population would continue expanding until growth is stopped or reversed by disease, famine, war or calamity. He is also known for his exponential formula used to forecast population growth.

- Population growth is faster than the growth for the means of subsistence such as food and clothing, on-setting poverty.
- Population control is significant to sustain the population.
- Positive checks restore the balance between the increased growth rate of population and food supply.
- Despite of its criticisms, this theory does apply to the over-populated countries like India for the following reasons:
- India’s population grows at a rate of 2.3% per annum.

- India still imports millions of tons of food grains to meet its demand.
- 39% of the Indian population is below the poverty line.
- The lower life expectancy and higher death rate are other major complications in India.

Not only India, in under-developed countries like Africa, the population growth is faster than the food supply, resulting in death by starvation. Considering all these challenges, the world needs policies not only economically but also to guide the consumption and production processed by making efficient use of limited resources. This can be done by being innovative and focused on sectors that kindle a resource-efficient economy. One such sector is biotechnology. Due to its holistic nature, it provides solutions to these societal challenges. India has witnessed the growth of the biotech sector and due to its high-skilled labour and low-cost advantages; India has gained more export contracts.

THE COMMON TYPES OF BIOTECHNOLOGY SERVICES ARE AS FOLLOWS.

- Red indicates Medical biotechnology
- White indicates Industrial biotechnology
- Green indicates Environmental and Agricultural Biotechnology
- Blue indicates Marine Biotechnology

a) Medical Biotechnology (RED)

Medical biotechnology which considers human health, uses living cells and cell materials to research and then produce pharmaceutical drugs, antibodies, vaccines and many more.

b) Industrial Biotechnology (WHITE)

Industrial biotechnology is the largest branch of biotechnology and it includes various sectors such as food, textile, energy, etc. Its focus is on using technology to create new processes with the use of natural resources and energy.

c) Environmental and Agricultural Biotechnology (Green)

These two areas of biotechnology are both put into the ‘green’ category. Basically, green biotechnology concentrates on technologies related to agriculture to produce stronger crops or to create new bio pesticides.

Agricultural biotechnology also includes:

- Using bacteria to encourage plant growth and improve crop yield.
- In the environment heavy metals are remove by using plants.
- By genetic operation the damages for plant thrive due to damaging because of weather conditions are controlled
- Artificial inseminations are used for animal breeding.

With regard to environmental biotechnology, the main goals are combining biology with engineering. This can develop various processes to clean contaminated sites and use various microorganisms to eliminate pollutants in the environment.

Environmental biotechnology tasks include:

- Bio fuels converting from plants
- Bio plastics from plant
- Using geographic information system to find and map contaminated sites
- Converting waste into natural sources of energy
- Instead of chemical for industrial processes to made cleaner using bhiological enzymes.

d) Marine Biotechnology (BLUE)

Study of marine organisms is encoded in Blue biotechnology it focus on creating new medicines of food supplements to enhance human health. Examples include Ziconotide which is an effective pain killer.Another field where marine biotechnology is used is in creating alternative sources of energy. Examples include biofuels made from micro algae which is artificially grown.Various proteins, bio polymers, bio materials and enzymes are produced in large quantities from the marine ecosystem and are highly beneficial to the industrial sector.

ECONOMICS OF BIOTECHNOLOGY

In the word wild India is 12 largest destinations for biotechnology based industries. Almost 2,700 biotech start-ups and 2,500 biotech companies are in the country. India has nearly 665 *Food and Drug Administration* FDA-approved plants. India stands third largest producer of recombinant Hepatitis B vaccine, while in BT cotton production it stands 2nd largest producer.

AN OVERVIEW OF INDIAN BIOTECHNOLOGY SIZE AND LANDSCAPE OF THE INDUSTRIES.

The Indian Government created the Department of Biotechnology during 1980. The Indian biotechnology industry amounted from 1.1 billion US dollar in 2003 to 63 billion US dollar in 2019 and is forecast to reach 150 billion US dollar by 2025, with a CAGR of 16.4% by 2025. Approximately India contributes 3% share in the global biotechnology industry.

In India during 2019, 58 % market share was contributed by Biopharmaceutical, 19 % shared by Bio-agriculture, and bio-services accounted for 15%. In India Biotechnology is becoming a leading destination for clinical trials, contract research and manufacturing activities in the country.

a) 4.1 Serum Institute of India

An important Indian biotechnology and biopharmaceuticals company is Serum Institute of India (SII) founded by Cyrus Poonawalla in 1966. It Producing Vaccines, biopharmaceuticals, generic drugs, in 2019-20 revenue of this company was ₹5,926 crore. Net income of ₹2,251 crore. It is one of the world's largest manufacturer of vaccines.

b) 4.2 Biocon Ltd

Biocon Limited is one of the Indian biopharmaceutical company that is based in Bangalore, India. The company manufactures generic active pharmaceutical ingredients (APIs) that are sold in over 120 countries across the globe. Biocon is also a large producer of novel biologics, as well as, bio similar insulin and antibodies. Biologics, Small molecules, Branded formulations, Research services in 2019-20 revenue of this company was ₹6,528.60 crore and Net income of ₹748.20 crore

BIOTECHNOLOGY AND INDIAN LABOR MARKET

Biotech sector is currently growing at a rate of 20% and is giving great career opportunities to qualified individuals. Well knowledge, skilled and experience biotechnologies are paid high salaries in above said companies. So this field has high level of employment generating and notable sector. At present, nearly there are 12 leading companies with the highest employment rate and average annual salary are paid by the leading biotech companies approximately ranges from Rs.2,29,238 to Rs.8,28,746 per year. The numbers are projected to double in the future.

2. CONCLUSION

The economic benefit of all emerging technology is reduction of cost and maximization of financial wellness as well as health. The level of the benefit is a function of the level of the market and its benefits from new technology. New types of illness and different types of health related issues have been witnessed in recent years; some of the basic livelihoods of the people are hardly hidden by the various health illnesses. One hand new variant illness hits human lives at the same time new field of study and business emerging on account of above said illness like Covid etc., the best thing about being new technologies like biotechnology is the chance to be flexible. Instant focus more on the business side of biotech has the potential to serve the society, and be helpful for the human race in the medical as well as economic side of the country.

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