

Biotechnology: Boon or Bane to Humankind

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Abstract

There are thousands of myths taken place against the concept of biotechnology. In India due to many reasons, biotechnological crops failed. It shows here that biotechnology is not good at all to the humankind. But this is half-truth of the research; if we have properly investigated we will definitely understand the truth behind biotechnology. If it will use properly by the human, then its real boons for the humankind but exaggerated research can turn into the bane for humankind. The researcher is throwing light on the same and trying to make it sure that biotechnology is the boon than the bane for the society.

Key Words: Biotechnology, Humankind, Myth,

Introduction:

Biotechnology is not very popular term amongst Indians because there are thousands of myths behind the concept. Actually it is the use of biological processes, organisms, or systems to manufacture products intended to improve the quality of human life. Basically technologists are trying to discover many researches under biotechnology so they can create sustainable development for all the areas of world like agriculture, Chemical, Industry, Medical etc; off-course it is betterment for the human life and their development. The earliest biotechnologists were farmers who developed and improved species of plants and animals by cross pollenization or cross breeding and even fermentation. Now there is a concept of Industrial biotechnology, which is one of the most promising technologies in all over the world. It has the potential to address some of the world's greatest challenges, such as feeding a growing population and offering new alternatives to our scarce natural resources. Although there is a long way to go, if industrial biotechnology reaches its full potential it has the potential to impact the world. But----- many of the activists are thinking that biotechnology is useless because of various reasons, it is just bane for the human kind. Centre for Science and Environment (CSE), has tested 65 food products in India likely to have GM ingredients, and found them in 32% of its samples. CSE says this endangers our health. That is an unscientific falsehood. The researcher is highlighted here that biotechnology is important and beneficial to humankind also highlighted it may create dangerous situation for the humankind as mentioned by the many activist that it is not safe to the world.

Problem and Importance of the study:

In India farmers or small scale and cottage industries are in depraved position, if the government wants their development, it has given them flexibility to use of biotechnological products in their industries or farm. It can give them more production and wealth for survival. Today due to various circumstances farmers hanged themselves and suicide numbers are growing day by day. Biotechnology is one of the boons for Indian farmers as well as industries for their sustainable development. The research study is throwing light on the boon and bane of the biotechnology.

This study basically highlighted the truth and the myth of the “biotechnology” term. Many of the scientists believe that biotechnology is boon for the humankind; hence with the help of secondary data collection a researcher is trying to show that either it is boon or bane for the people.

Literature reviews:

Craig Shimasaki: 2014 the author throws light on ‘how-to’ for individuals training at any level for the biotech industry, from macro to micro. Coverage ranges from the initial challenge of translating a technology idea into a working business case, through securing angel investment, and in managing all aspects of the result: business valuation, business development, partnering, biological manufacturing, FDA approvals and regulatory requirements. An engaging and user-friendly style is complemented by diverse diagrams, graphics and business flow charts with decision trees to support effective management and decision making.

Ahindra Nag : 2008, has written that biotechnology in the agricultural area plays a very important role for the development of agricultural crops which can provide high production and best nutritional value and show improved resistance to pathogens means disease causing microorganisms, such as bacteria, fungi, and viruses. The book also describes the benefits of bio-fertilisers and bio-pesticides to overcome hazardous effect of chemical fertilisers and pesticides.

Craig Shimasaki: 2014, The author works on developing new biotechnological projects. He draws extensively on his own experience and brings together the factors which determine commercial reasoning towards biotechnology in areas such as markets, project selection, costing and capital investment. His subjects include market analysis, fermentation, enzyme technology, genetic engineering and many others; they are all tied together by a common framework of industrial and technological development.

Hallam Stevens: 2016, offers an up-to-date primer to help us understand the interactions of biotechnology and society. The book presents a clear, authoritative picture of the relationship between biotechnology and society today, and how our conceptions (and misconceptions) of it could shape future developments.

NicoStehr: 2017, he has highlighted the contribution with the help of various authors for the practical fruits of biotechnology and can do so through sober examination of the economic, social, and cultural implications of biotechnology.

All these literatures show about the benefits of the biotechnology but authors also warn to the people that they must take precautions while using biotechnology.

Objectives of the study:

The study develops with the help of following objectives

1. To find out history of biotechnology
2. To examine the boons of biotechnology to humankind
3. To examine the banes of the biotechnology to humankind
4. To find out precision for the situation

Hypothesis:

The study depends on the hypothetical statement that, “The biotechnology is boon for the humankind”.

Research methodology:

Data Collection: Data collected through secondary sources like e-Books, references, science journals, E-newspapers, blogs, websites etc

Time Period: For study time is considering from the history of biotechnology to new development till date.

Limitations of the study: Elementary study was must for this topic but due to time constraint, it was not possible for the researcher. Otherwise paper could have thrown the light on farmers’ and cottage industrialists’ experiences, which would have shown the perfect result for the study.

Facts and findings:

Biotechnology is the broad area of biology involving living systems and organisms to develop or make products, or "any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use" (UN Convention on Biological Diversity, Art.-2). For thousands of years, humankind has used biotechnology in agriculture, food production, and medicine.

According to the office of Technology Assessment of the U.S. Congress "Biotechnology is any technique that uses living organisms or their products to make or modify a product, to improve plants or animals, or to develop microorganisms for specific uses."

History of biotechnology

Biotechnology is not a new concept; traditional products like bread, beer, cheese, wine, and yoghurt all make use of natural processes. In 1919, the Hungarian engineer Karoly Ereky has been coined the term. But after 20th and in the beginning of 21st century biotechnology has included many new researches through the diverse science like genomics, recombinant gene technique, applied immunology and development of pharmaceutical therapies and diagnostic tests. Before this, in 1800 century Louis Pasteur proved that fermentation was the result of microbial activity. Then in 1928, Sir Alexander Fleming managed to extract penicillin from mold. In the 1940s, large-scale fermentation techniques were developed to make industrial quantities of this wonder drug, but it wasn't until after the Second World War, that the biotechnology revolution began, making way to modern industrial biotechnology as we know today. The word defines itself: **bio** means life and **technology** is defined as the application or harnessing of science for a specific purpose. Biotechnology is classified into sub-disciplines called red, white, green, and blue. Following table gives the clarity

Classification of Biotechnology (Table 1)

Classification	Area	Work	Involvement
Red	Medical	<ul style="list-style-type: none"> Organisms to produce new drugs, or Using stem cells to regenerate damaged human tissues Perhaps re-grow entire organs. 	Human life, Organs
White/Gray	Industry	<ul style="list-style-type: none"> Production of new chemicals Development of new fuels for vehicles 	Machineries, Materials
Green	Agriculture	<ul style="list-style-type: none"> Processes as the development of pest-resistant grains The accelerated evolution of disease-resistant animals 	Plants, Trees, Animals
Blue	Marine & Aquatic	<ul style="list-style-type: none"> Controlling the proliferation of noxious water-borne organisms. 	Water-related species

Source: Self-compiled from whatis.techtarget.com

The boons of biotechnology to humankind:

Norman Borlaug, Nobel laureate and father of the Green Revolution, called Genetically Modified (GM) crops a boon to humanity, blasting alarmists for bogus propaganda. Science writer Matt Ridley, author of the best-seller *Genome*, has long exposed the anti-GM campaign as unscientific. A green activist, Mark Lynas, winner of the Royal Society Science Book Prize for *Six Degrees*, was once destroying GM crops but later apologized for "demonizing an important technological option". He further added "I'd assumed that GM would increase

the use of chemicals. It turned out that pest-resistant cotton and maize needed less insecticide". These two examples are enough evidence to show the importance of biotechnology in the mean time

Medicine and Pharma: Benefits of biotechnology can also be experienced in the medical institution. Its technological application includes pharmaceutical products and medicines, and human therapy. DNA fingerprinting is used to diagnose inherited disorders in both prenatal and newborn babies in hospitals around the world. Genetic diseases could be treated through the use of genetic engineering. Defective genes in an organism cause genetic disorders. If a defective gene could be identified and located in a particular group of cells – it could be replaced with a functional one. According to the “International Service for the Acquisition of Agri-biotech **Agriculture: Applications**” (ISAAA), from 2007 the Global uses of biotech crops are reaching a historic 282 million acres in 23 countries and more than 18 million farmers in 28 countries planted biotech crops in 181 million hectares in 2014, reflecting a 6.3 million or 3% to 4% increase in global biotech crop land. It shows the popularity of biotechnology in agriculture business. The reason for such impressive worldwide adoption rates is simple; as they are giving many benefits said Jim Greenwood, president and chief executive officer of the Biotechnology Industry Organization (BIO). According to him the following benefits are being received by the farmers.

- Helping to provide for more sustainable agricultural production,
- A reduction in the environmental impacts of agriculture,
- Increased production on the same amount of land,
- Improved food quality, and increased farmer incomes.
- Enhanced potential for more vigorous growth and increasing yields
- Increased resistance to natural predators and pests, including insects and disease-causing microorganisms.
- Production of hybrids exhibiting a combination of superior traits derived from two different strains or even different species
- Selection of genetic variants with desirable qualities such as increased protein value, increased content of limiting amino acids, which are essential in the human diet, or smaller plant size, reducing vulnerability to adverse weather condition.

More than 12 million farmers around the world have chosen biotech crops because of the significant socioeconomic, environmental, and agricultural benefit they provide. But in India the situation is poor to adopt biotechnology in agricultural business easily.

The banes of the biotechnology to humankind

A common misconception is the thought that biotechnology is relatively new because it only involves working with DNA and genetic engineering. Biotechnology is not new, society has been manipulating living things to solve problems and improve their way of life for millennia. But it can be avoided with the strict rule and norms of the Government.

If biotechnology provides more harm than benefits to the surroundings then it would definitely be a part of a much bigger problem. It may seem bizarre or even offensive, if you are a vegetarian to think that the tomatoes you buy and eat, could have fish genes in them. Some of these combinations might be not only peculiar but downright dangerous to our environment or even our own health. But these are if and buts there are remote chances to happen such situation. Even some geneticists feel that though the artificial nature of genetic modification does not make it dangerous, the imprecise way in which genes are combined and the unpredictability in how the foreign gene will behave in its new host results in uncertainty. From a basic genetics perspective, GM products possess an unpredictable component that is far greater than the intended change

The Precision for the situation

Biotechnology, like other advanced technologies, has the potential for misuse. Concern about this has led to efforts by some groups to enact legislation restricting or banning certain processes or programs, such as human cloning and embryonic stem-cell research. There is also concern that if biotechnological processes are used by groups with nefarious intent, the end result could be biological warfare. The global anti- Genetically Modified (GM) chorus flows from various prejudices, ranging from leftist hate of large corporations to RSS belief in the superiority of all things traditional Indian. This is pseudo-science, not the real thing. Even one more thought that GM benefited only the large companies. It turned out that billions of dollars of benefits went to farmers needing fewer inputs. Actually BT cotton was pirated into India and Roundup-Ready soybean in Brazil because farmers were so eager to use them. GM was dangerous. It turned out that it was safer and more precise than conventional breeding. GM just moved a couple of genes whereas conventional breeding mucks about with the entire genome in a trial and error way. In India, vanaspati has long been made from imported GM oils. GM cotton in India yields GM cottonseed oil, widely used in vanaspati and snacks. GM cotton-seed has for decades been fed to animals, and become part of India's dairy and meat supply. Has this ruined our health? No evidence at all. (Swaminathan A Aiyar: ET contributor: 1st August 2018) It proves here if there is no evidence for damages to humankind due to biotech, then why we are not taking the benefits from this technology.

Conclusion:

Biotechnology is an emerging platform. The potential benefits include solving world food shortages, and improvements in medicine, agriculture, and veterinary sciences. Based on our own experience, we see a greater transformation in the way industrial chemical are being manufactured with conscious efforts of reducing the toxic waste. It shows that biotechnology is really boons for the farmers and the industries if it uses properly and perfectly. Yes we have to avoid some scientific task from biotech then it will be definitely a boon for humankind that bane to us. Hence it proves the hypothetical statement that "The biotechnology is boon for the humankind".

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