

# Potentials of biotechnology

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Biotechnology is the application of any technology to biological systems and living organisms or derivatives to develop or make useful products for specific use. Biotechnology and human civilisation are rolling together side by side undoubtedly from the very beginning of history but the story of modern biotechnology is not more than four decades old. Traditional Biotechnology, which led to the development of processes for producing various products like bread, yogurt, or vinegar, was entirely pragmatic and lacked any understanding of the mechanisms that led to the product. There was no deliberate design to produce a desired new product. In contrast, modern biotechnology uses the in-depth understandings that have been gained little by little. In the case of an established product, the new biotechnological process is cost effective and better in various aspects than the earlier processes. Whatever is the technology, traditional or modern, we are in a place of being blessed with the fruits of biotechnology from dawn to dusk.

Unraveling the structure of DNA by Watson and Crick in 1953 was the most important discovery in 20th century. This discovery has initiated a new era in science that has achieved enormous speed in research and discovery with the genetic engineering in its belt since 1970. Modern biotechnology is overpowering fictions one after another through amazing discoveries such as Insulin-producing bacteria for the treatment of Diabetes, making 'Dolly', the first clone of a sheep or creating artificial life 'Synthia' introducing artificially synthesised genetic material from raw materials into an organism without genetic material. Stem cells from which

scientists are now producing heart cell-like beating cells, and differentiating them into other cell types is an emerging discipline that takes biotechnology a step further.

Biotechnology has applications in four major industrial areas, including health care, agriculture, industrial uses of crops and other products like biofuels, biodegradable plastics etc.,

Green, Red, White, Gold etc.

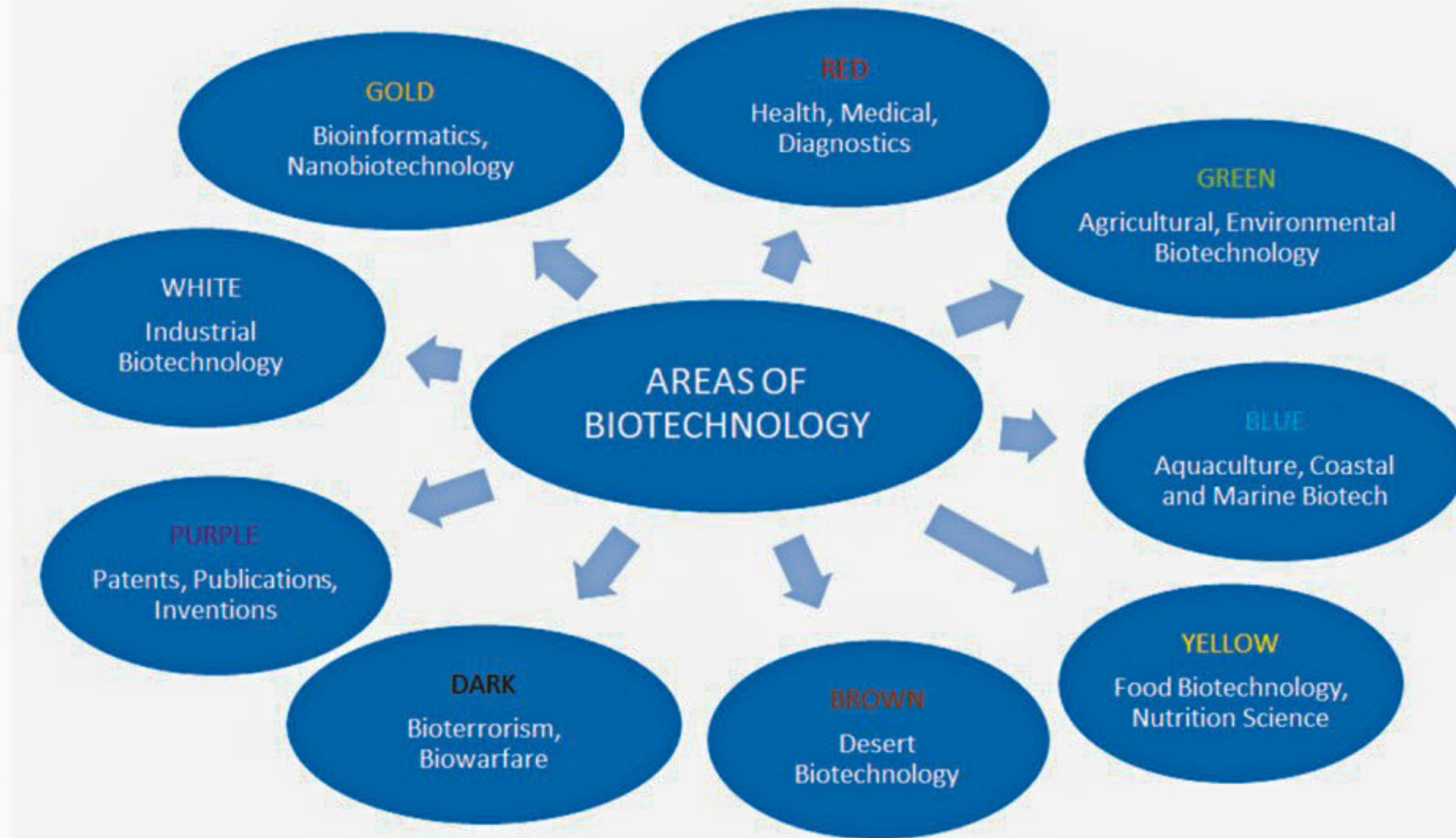
During the last four decades biotechnology has been changing the world through considerable progress in agriculture, health, environment, industrial sectors and so on. Within this short span of time, recombinant DNA technology, which was hitherto considered primarily a fundamental subject, has proved beyond doubt its

these techniques in contributing economic growth in an environmentally safe manner. They have made significant strides in the development and commercialisation of biotechnology over more than two decades. Our neighboring country, India, for example has taken the advantages of this technology in a wide variety of areas, including crop management, forestry,

race with the whole genome sequence of Jute, or introducing genetically modified variety of Bt-brinjal.

Bangladesh is an agro-economy based country with a large population compared to its land area and resources. With the country's population projected to reach 192.9 million by 2025 and economic growth transforming the lives of millions, our food demand is expected to be much higher than its current growth of production. Such crop production would have to be achieved in an adverse climatic condition. Therefore, there is a growing need to develop stress tolerant crop varieties to combat climate change induced disasters like flood, drought and intrusion of salinity. Improvement of fisheries & livestock, biodiversity conservation, biological and industrial waste management, health care systems, forestry and environment sectors deserve much attention. Biotechnology can play important roles to address the above issues.

Significant initiatives has been taken by the Government of Bangladesh to promote biotechnological research and infrastructure development in the country for enhanced productivity, quality and value of products, stability of production systems and environmental conservation leading to sustained food security, poverty alleviation and livelihood security. With an aim to accelerate the research activities in the field of biotechnology, the government has established the National Institute of Biotechnology (NIB) under the auspices of Ministry of Science & Technology, as a specialised Institute in Biotechnology. Soon after its establishment, NIB has been accepted by the national and international community.



and environmental uses. Moreover, biotechnology is not just a technological matter; its development involves cutting-edge science, political, legal, and economic variables, and external and internal negotiations and also to address the social and ethical challenges. A series of derived terms have been coined to identify several branches of biotechnology namely

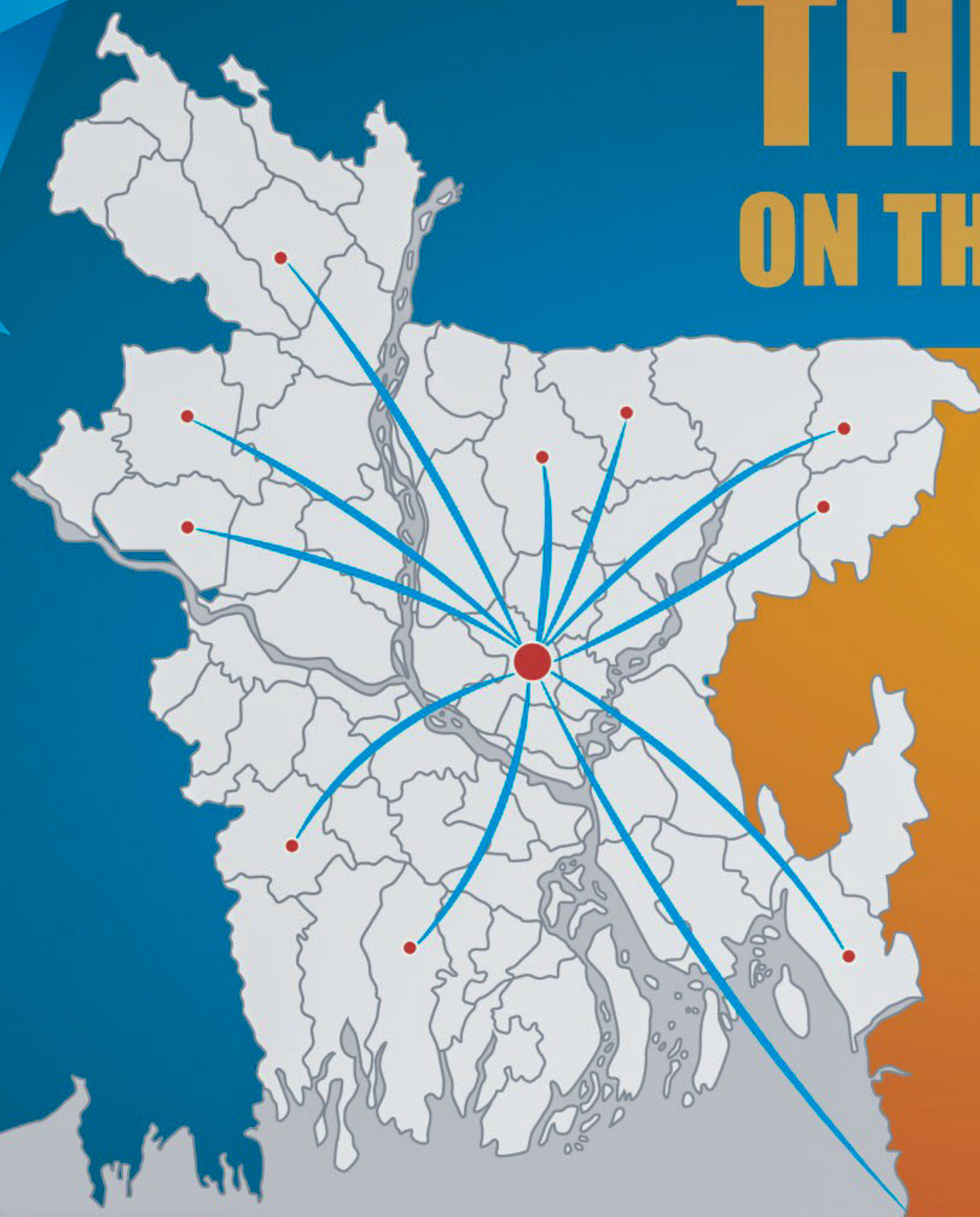
applicability in several areas of human welfare. In a world specially developing world with changing climate, increased population and heavy industrialisation are now concentrating on the exploitation of the golden pit of biotechnology. Many Asian countries, namely India, China, Philippines, Thailand, Pakistan, Malaysia, and Vietnam have recognised the potential of

biopesticides, and biofertilisers. Through international collaboration, Kenya has taken national policy in developing transgenic plants resistant to pathogens or environmental stress as well as vaccines for livestock. While other countries including our neighbours have made or are making impressive progress in biotechnology, Bangladesh very recently showed that they are also in the

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