



Mains Practice Question

Q. Genome India Project provides an opportunity for India to make great progress in the fields of biotechnology, agriculture and healthcare. Discuss. (250 words)

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Approach

- Briefly explain Genome India Project
- Highlight the project's applicability in biotechnology, agriculture and healthcare sector, and how such will present opportunity for India towards progress/contribution.
- Highlight some challenges to the project.
- In conclusion, give some measures to overcome these challenges.

Introduction

Genome India Project (GIP) is a gene-mapping exercise to be done by collaboration of 20 institutions like IISC, IITs, AIIMS with aim of ultimately building a grid of the Indian "reference genome", to fully understand the type and nature of diseases and traits that comprise the diverse Indian population. The project hopes to form a grid after collecting 10,000 samples in the first phase from across India, to arrive at a representative Indian genome.

Body

This will help provide an opportunity for India to make progress in various fields:

- **Biotechnology:** The project itself is inspired from Human Genome Project (HGP) to decode the entire human genome based on the concept of DNA. But HGP is mapped mostly from urban white peoples. GIP will add Horizontal Diversity, as by migration numerous races have come to India and intermingled, and also Vertical Diversity, as due to endogamy, inter-marriages some traits have been passed on within some groups.
- **Healthcare:** GIP will help in the development of personalised medicine, anticipating diseases and modulating treatment according to the genome of patients. For example, cardiovascular disease generally leads to heart attacks in South Asians, but to strokes in most parts of Africa. If such propensities to disease can be mapped to variations across genomes, it is believed that public health interventions can be targeted better, and diseases anticipated before they develop.
- **Agriculture:** Better understanding of the genetic basis of the susceptibility of plants to pests, insects and other issues hampering productivity along with reducing dependence on chemicals will help in attaining the goal of Sustainable Agriculture.

Challenges to GIP

- Collection of genes and mapping groups can reinforce stereotypes, more so in countries like India where caste, race distinction is clearly visible.
- **Integrity of data** collection, storage and usage will remain elusive as till Data Protection Bill has not been passed.
- Ensuring that project upholds the medical ethics.

Conclusion

GIP, thus, gives India immense opportunity to encash on biotechnology revolution. There is a need for enhanced collaboration among research institutions, more human resources in related fields, tackle challenges to GIP along with diversifying benefits to more sectors.

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