
Prelims and Mains focus: about the project and its significance

News: The government has cleared an ambitious gene-mapping project that is being described by those involved as the “first scratching of the surface of the vast genetic diversity of India”.

Background

- Steps to get the project underway started in 2017 when Infosys co-founder Kris Gopalakrishnan set up the Centre for Brain Research at IISc for research in ageing and diseases such as Alzheimer’s.

- As part of a two-pronged approach, Gopalakrishnan provided funding of Rs 275 crore for a rural pilot project in Kolar and Tata Trusts came up with Rs 75 crore to fund the corresponding urban project in Bengaluru.

- The group involved in the initiative then approached the central government for a nationwide project to sequence the Indian gene and push research in medicine.

- Referring to “new schemes” in the Budget 2020-21, the government said that mapping of India’s genetic landscape is critical for next generation medicine, agriculture and for bio-diversity management. To support this development, it will initiate two new national level Science Schemes, to create a comprehensive database.

About the project

- The Rs 238-crore Genome India Project, which will involve 20 leading institutions including the Indian Institute of Science (IISc) in Bengaluru and a few IITs, will be rolled out soon.
• Cleared by the Department of Biotechnology (under the Department of Science and Technology) the first stage of the project will look at samples of “10,000 persons from all over the country” to form a “grid” that will enable the development of a “reference genome”.

• The IISc’s Centre for Brain Research, an autonomous institute, will serve as the nodal point of the project and its director will be the coordinator.

• The project is said to be among the most significant of its kind in the world because of its scale and the diversity it would bring to genetic studies.

• The institutions involved will work on different aspects of the project, including providing clinical samples and assisting with research. Some IITs will help with new methods of computation, which are essential.

Benefits of collaborations

• To really arrive at a breakthrough with modern lifestyle diseases such as cardiac diseases, diabetes or other mental health issues, large collaborations were the need of the hour, combined with huge technological and computational endeavours.

• For instance, “Nature” and its affiliated journals reported the results of a decade-long global collaboration involving 1,300 scientists to map genetic mutations that drive the development of cancer. This is expected to play a significant role in reducing the mortality rate linked to cancer.

Significance of the project

• Mapping the diversity of India’s genetic pool will lay the bedrock of personalised medicine and put it on the global map.
Considering the diversity of population in India, and the disease burden of complex disorders, including diabetes, mental health, etc., once we have a genetic basis, it may be possible to take action before the onset of a disease.

Scientists linked to the Indian project say genetic studies so far are based on “almost 95% white caucasian samples”. “What makes the IISc’s pilot rural Kolar study unique is that it is not of urban and rich or middle-class samples, and that could potentially have revolutionary implications on world research.

It is established that the first migrations of humans were from Africa to India, and then there were several waves of migration that provided vast horizontal diversity. And, with endogamy being practiced over many generations, across groups, the project may help to get a sharper understanding of diseases transmitted genetically down the line as well as some healthy attributes.