GENOME INDIA INITIATIVE

Prelims: Science & Technology- Biotechnology

Mains:

GS-III- Science and Technology - developments and their applications and effects in everyday life Achievements of Indians in science & technology; indigenization of technology and developing new technology.

GS-III- Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

Why in News?

- The Department of Biotechnology (DBT) plans to scan nearly 20,000 Indian genomes over the next five years, in a two-phase exercise, and develop diagnostic tests that can be used to test for cancer.

Genome India Initiative:

- The initiative aims to make predictive diagnostic markers available for some priority diseases such as cancer and other rare and genetic disorders
- The first phase involves sequencing of complete genomes of nearly 10,000 Indians from all corners of the country and captures the biological diversity of India.
- In the next phase, about 10,000 "diseased individuals" would have their genomes sequenced.
- These vast troves of data sets would be compared using machine learning techniques to identify genes that can predict cancer risk, as well as other diseases that could be significantly influenced by genetic anomalies.
- 22 institutions, including those from the Council of Scientific and Industrial Research (CSIR) and the DBT would be involved in the exercise.
- The data generated would be accessible to researchers anywhere for analysis.
- This would be through a proposed National Biological Data Centre envisaged in a policy called the 'Biological Data Storage, Access and Sharing Policy', which is still in early stages of discussion.

Genome:

- A genome is an organism's complete set of DNA, including all its genes.

- It contains all the information needed to build and maintain that organism.
- By sequencing the genome, researchers can discover the functions of genes and identify which of them are critical for life.

Significance:

- There is interest among private and public companies in sequencing genomes thanks to the declining costs for the process.
- From China to the United Kingdom and Saudi Arabia, several countries have announced plans to sequence their population.
- Currently, genomic data sets under-represent Asia, particularly India, whose population and diverse ethnicity make it an attractive prospect for genome-mining efforts.