

# Earth Bio-Genome Project (EBP) - UPSC Environment & Ecology Notes

The Earth Bio-Genome Project is an initiative aimed at analysing and sequencing the genomes and creating a new foundation for biology to drive solutions for preserving biodiversity and sustaining human societies. Students preparing for the [IAS Exam](#) or any other Government Exam must know about this topic.

The Earth Bio-Genome Project is an important topic under Environment and Ecology, General Studies Paper III of the [UPSC syllabus](#). The topic finds relevance in both Prelims as well as Mains examination.

## Earth Bio-Genome Project (EBP)

There are about 8 million eukaryotic species and only 0.2% of the eukaryotic genome have been sequenced so far which are still in the crudest form. The Earth Bio-Genome Project is the initiative aimed at analysing and sequencing the genomes of all the Earth's Eukaryotes over a time frame of ten years.

Eukaryotes are organisms whose cells have a nucleus enclosed within membranes, whereas prokaryotes (Bacteria and Archaea) have no membrane-bound organelles.

A conceptual argument for sequencing eukaryotic life was made by Stephen Richards in 2015. Powerful advances in genome sequencing technology, informatics, automation, and artificial intelligence have propelled humankind to the threshold of a new beginning in understanding, utilizing, and conserving biodiversity.

### What is Earth Bio-Genome Project (EBP)?

The Earth Bio-Genome Project (EBP) is an international consortium of scientists which would undertake the project that aims to sequence, catalogue, and characterize the genome of every eukaryotic biodiversity on Earth, over a period of 10 years.

- It is basically an international catalogue of life on Earth.
- It aims to sequence 1.5 million species in three phases.

### EBP Vision

The Earth Bio-Genome Project aims at creating a new foundation for biology, encompassing a broad range of major issues facing humanity, such as the impact of climate change on biodiversity, the conservation of endangered species and ecosystems, and the preservation and enhancement of ecosystem services.

- The project could also lead to the discovery of more drugs and let researchers find more sources of food as well.

Also read: [Climate change in India](#)

### What is the purpose of the Earth Bio-Genome Project (EBP)?

The EBP project will help to create a detailed genetic sequence and reveal evolutionary connections among genus, orders and families that will make up the **Digital Library of life**.

- The digital repository of genome sequences would provide the critical infrastructure for the better understanding of ecosystems and conservation of biodiversity as well as the development of new

treatments for infectious and inherited diseases, agricultural products, biomaterials and biological fuels.

- EBP would enable gathering, preservation and cataloging of economically important as well as endangered species.
- The genetic information being decoded would prove to be a useful tool in the prevention of biopiracy.

## Members of Earth Bio-Genome Project (EBP)

Earth Bio-Genome Project (EBP) is an international consortium of scientists.

- Other Partners of EBP are Africa, Australia, Brazil, Canada, China, the European Union and the United States, Global Genome Biodiversity Network, the Global Invertebrate Genomics Alliance, the i5K Initiative to sequence 5000 Arthropod Genome and Genome 10K Project.

## What are the challenges involved?

- There is a need for placing strong and well-defined data sharing policies that respect the access and benefit-sharing guidelines included in the Nagoya Protocol, in order to ensure permanent, freely available resources for further scientific discoveries.
- There is a need for coordinated global efforts along the lines of the Large Hadron Collider at CERN, as the project might have to face similar organisational as well as scientific challenges during the execution of the project.
- Considering the remoteness of natural habitat, difficulties might arise in the collection of samples.
- Storage as large as 200 petabytes would be needed for the huge database thus created.
- Another challenge that the project would face is raising and securing funding for a project as massive as this one.

The World Economic Forum is also collaborating with EBP through its Fourth Industrial Revolution for the Earth Initiative under which they are developing Earth Bank Codes. Thus the Fourth Industrial Revolution in biology could offer innovations to link new models for biodiversity management.