

## India's new guidelines on Genetically Modified Insects

### Why in news?

In April 2023, the Department of Biotechnology (DBT) issued the 'Guidelines for Genetically Engineered (GE) Insects'.

### What are Genetically Modified insects?

- A genetically modified insect is any insect whose genetic material has been altered using genetic engineering techniques.
- These techniques help achieve the desired physiological traits or the production of desired biological products.
- Such insects are also called Genetically Engineered insects (GE insects).
- **Control** - GE organisms or cells and hazardous microorganisms and products thereof are regulated as per '**Rules 1989**' under the *Environment (Protection) Act of 1986*.

### What are the significance of GE insects?

- Usage of GE insects uplifts the standard of living by reducing disease burden, enables food security and conserves the environment.
- **Economic value** - India's bioeconomy contributes 2.6% to the GDP.
- It is expected to be closer to 5% by 2030 as envisaged in the Department of Biotechnology's '*Bioeconomy Report 2022*' report.
- **Applications** - The development and release of GE insects offers applications in various fields such as
  - Vector management in human and livestock health;
  - Management of major crop insect pests;
  - Maintenance and improvement of human health and the environment through a reduction in the use of chemicals;
  - Production of proteins for healthcare purposes;
  - Genetic improvement of beneficial insects like predators, parasitoids, pollinators (e.g. honey bee) or productive insects (e.g. silkworm, lac insect).

### What is the guidelines about?

- The Department of Biotechnology (DBT) functions under Ministry of Science and Technology (MoST) is the nodal agency and promoter of biotechnology in India.
- DBT issued the 'Guidelines for Genetically Engineered Insects'.
- The guidelines provide procedural roadmaps for those interested in creating GE insects.
- The guidelines have been harmonised to the guidance from the World Health Organisation on GE mosquitoes.

## What are the issues with the guidelines?

- **Uncertainty of purpose** - The guidelines only provide regulatory procedures for R&D on insects with some beneficial applications.
- The guidelines don't specify the purposes for which GE insects may be approved in India or how the DBT envisions their use.
- **Uncertainty for researchers** - The guidelines are applicable only to research and not to confined trials or deployment.
- There is no criteria to approve the deployment of GE insects
- **Categorising** - The guidelines define GE insects by their risk group and not by the end product.
- **Uncertainty of ambit** - The guidelines offer standard operating procedures for GE mosquitoes, crop pests, and beneficial insects.
- There is a lack of clarity about the insects and the modifications to them that are deemed 'beneficial'.
- The absence of a precise stance to identify and promote research priorities hampers progress.
- **Unintentional ill effects** - Genetic engineering can also be used to unintentionally generate malicious products.
- The new guidelines don't sufficiently account for more dangerous possibilities.

## What could be done to improve India's bioeconomy?

- **Funding** - The ambitious leap of \$220 billion in 8 years as envisioned in 'Bioeconomy Report 2022 report' will require aggressive investment and policy support.
- Efforts are also needed to attract private funding in biotechnology research and development.
- **Robust Policy** - biotechnology policies also need to be aligned to the economic goals set out in the Bioeconomy report.
- **Deployment** - GE insects can't be recalled once deployed, so wider community engagement and monitoring of the impact of GE will be required.
- **Non-consumption GE insects** - GE insects for human/animal consumption require stringent checks but GE insects used for silk or lac production and other non-consumption do not require such checks.
- The guidelines can sidestep this by adapting its rules for genetically modified crops for non-consumption purposes.
- **Precise Guidelines** - Clear cut definition and ambit to be mentioned in guidelines to avoid any room for doubt.

*The bioeconomy is the using of renewable biological resources from land and sea, like crops, forests, fish, animals and micro-organisms to produce food, materials and energy.*

## References

1. [The Hindu - The problem with India's new guidelines on GE insects](#)

2. [DBT - Guidelines and SOP for Research on GE Insects, 2023 - PDF](#)

