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 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