



Mains Practice Question

Q. The use of pesticides and fertilizers in agriculture has led to a decline in the population of pollinators such as bees and butterflies. Discuss (250 words)

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Approach

- Start your answer by briefly discussing the effects of pesticides and fertilizers on Bees and butterflies.
- Suggest some measures to resolve these issues and provide government initiatives if possible.
- Conclude accordingly.

Introduction

- Agriculture is an essential part of human civilization, providing food and other resources for human survival. However, the use of pesticides and fertilizers in agriculture has led to negative consequences for the environment, particularly for pollinators such as bees and butterflies. Pollinators are essential for the reproduction of plants, and their decline threatens the food security and biodiversity of the planet.

Body

- **Impact of pesticides and fertilizers on pollinators:**
 - Pesticides and fertilizers are widely used in agriculture to protect crops from pests and diseases and to increase crop yields. However, these chemicals can have negative effects on pollinators like:
 - **Detrimental to Health:** Pesticides can harm bees and butterflies by **killing them directly or by making them more susceptible to diseases.**
 - **Change Biology of Flowers:** Fertilizers, on the other hand, can change the quality and quantity of flowers, making them less attractive to pollinators.
 - **Contamination of pollen and nectar sources:** According to various reports, pesticide contamination is widespread, with more than 90% of pollen samples from beehives in agricultural landscapes and more than 90% of stream samples contaminated with more than one pesticide.
 - This can lead to a decline in the health and population of pollinators, including bees, butterflies, and other insects.
 - **Colony Collapse Disorder (CCD):** It is the phenomenon of sudden and unexplained loss of bees from a hive. It is a complex problem that likely results from a combination of factors, including pesticides, disease, habitat loss, and other stressors.
- **Mitigating the Effects of Pesticides and Fertilizers on Pollinators:**
 - There are several strategies that can be used to mitigate the negative effects of pesticides and fertilizers on pollinators.
 - **Use alternative methods:** One approach is to use alternative pest management methods, such as biological control or integrated pest management.
 - These methods rely on natural predators, parasites, or pathogens to control pests, rather than chemicals.

- Additionally, farmers can use selective pesticides and fertilizers, which target specific pests or plants and have less impact on non-target organisms.
- **Restore Pollinator Habitat:** Another approach is to protect and restore pollinator habitats. This can include planting wildflowers and other plants that provide food and nesting sites for pollinators, and reducing or eliminating the use of pesticides and fertilizers in these areas.
 - Additionally, farmers can create a mosaic of different habitats on their land, such as hedgerows, woodlots, and wetlands, which can provide a variety of resources for pollinators throughout the year.
- **Related Government Initiatives:**
 - The Indian government recognizes the importance of pollinators and has implemented several initiatives to protect them from the negative effects of pesticides and fertilizers. Some of the major initiatives include:
 - **National Beekeeping and Honey Mission (NBHM):** This mission aims to promote beekeeping and honey production in India. It provides financial assistance to beekeepers for the purchase of bee colonies and beekeeping equipment.
 - **Integrated Pest Management (IPM):** The government has launched the IPM program to reduce the dependence on pesticides in agriculture. The program promotes the use of natural predators and other non-toxic methods to control pests.
 - **National Mission for Sustainable Agriculture (NMSA):** The NMSA promotes sustainable agriculture practices that are beneficial for pollinators. The mission focuses on reducing the use of chemicals in agriculture and promoting organic farming.
 - **National Action Plan for Pollinators (NAPP):** The NAPP is a comprehensive plan to protect and conserve pollinators in India. The plan includes measures to reduce the use of pesticides and promote the conservation of pollinators and their habitats.

Conclusion

The loss of pollinators has a significant impact on food security, biodiversity, and the environment. The Indian government recognizes the importance of pollinators and has implemented several initiatives to protect them from the negative effects of pesticides and fertilizers. However, more efforts are needed to mitigate the negative effects of pesticides and fertilizers on pollinators and to promote sustainable agriculture practices.