

Importance of pollinators in agriculture and economy

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Pollination though appears trivial, play a vital role in crop production. It does not only yield of crops but also boosts the economy. The recent studies on pollination and its impact is very beneficial to know mainly for Mains and the science behind pollination is important for Prelims.

In news Pollinator week was celebrated from June 22 to 28

Placing it in syllabus General Issues On Environmental Ecology, Biodiversity and Climate Change

Static dimensions

1. Pollination
2. Dependence on pollination in India

Current dimensions

1. Impact of Pollination on Agriculture
2. Impact of Pollination on Economy

Content

Pollination

- Pollination is the act of transferring pollen grains from the male anther of a flower to the female stigma.
- The goal of every living organism, including plants, is to create offspring for the next generation. One of the ways that plants can produce offspring is by making seeds.
- Seeds contain the genetic information to produce a new plant.
- Flowers are the tools that plants use to make their seeds.
- Seeds can only be produced when pollen is transferred

between flowers of the same species.

- A species is defined as a population of individuals capable of interbreeding freely with one another but because of geographic, reproductive, or other barriers, they do not interbreed with members of other species.
- Flowers must rely on vectors to move pollen.
- These vectors can include wind, water, birds, insects, butterflies, bats, and other animals that visit flowers. These vectors that transfer pollen from plant to plant are pollinators.
- Types of pollination:
 - Self-pollinating – the plant can fertilize itself.
 - Cross-pollinating – the plant needs a vector (a pollinator or the wind) to get the pollen to another flower of the same species.

Dependence on pollination in India

- Most food crops in India need insect (primarily bee) pollination.
- According to a study published by the International Research Journal of Natural and Applied Sciences, oilseeds (sunflower, safflower), vegetables (carrot, coriander, cucumber, onion, etc) and fruits (apple, almond, apricot, peach, etc), all rely on pollinators.
- The Zoological Survey of India says that pollination by flies (myophily) is economically important as well in tropical areas, flies are primary pollinators of the cacao, mango, cashew, tea and other cash crops.

Impact of Pollination on Agriculture

- The importance of bees and other pollinators such as birds and bats in food production cannot be downplayed: They affect 35 percent of the world's crop production and increase outputs of 87 of the leading food crops worldwide, according to the Food and Agriculture Organization (FAO).

- One of the aims of Pollinator Week (June 22-28) is to highlight how the entire agricultural process can be affected by pollination.
- “Well-pollinated crops can be of noticeably better quality, something that markets are sensitive about,” said Rapid Assessment of Pollinators’ Status, a report published by the FAO.
- Insect pollinators are responsible not just for the reproduction of crops, but also increases in yield.

Yield increase due to bee pollination

Crop	Yield increase (in percent)
Mustard	43
Sunflower	32-48
Cotton	17-19
Lucerne	112
Onion	93
Apple	44

Source: Tamil Nadu Agriculture University (TNAU)

The declining number of pollinators, however, threatens crops that are dependent on them.

Fifty million hectares of crops across India depend on pollination by bees. The absence of bees and other pollinators would wipe out coffee, apples, almonds, tomatoes and cocoa. There is a need to shift to more pollinator-friendly and sustainable food policies and systems.

Impact of Pollination on Economy

- The role of pollinators in enhancing biodiversity and increasing crop yield is so significant that its economic value is worth billions of dollars, showed a report that discussed the impact of pollination in food production.

- The annual market value of crop production directly linked to pollination was \$235-\$577 billion, according to The Assessment Report on Pollinators, Pollination and Food Production published by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) in 2017.
- In India, rapeseed and mustard depend the most on pollination. The estimated economic value of pollination for oilseeds, fruits, vegetables, fibres and spices was estimated by Economic benefits of animal pollination to Indian agriculture, a 2017 study published by the Indian Journal of Agricultural Sciences.

Economic value of pollination for crops

Crop	Economic value (in Rs crore)
Rapeseed and mustard	19,355.70
Oilseeds	43,993.08
Fruits	17,095.45
Vegetables	19,498.20
Fibres (mainly cotton)	17,290.66
Spices and condiments	10,109.43

Source: Economic benefits of animal pollination to Indian agriculture, 2017

Mould your thought What is pollination? How does it impact agriculture in India, thus the economy? Explain.