

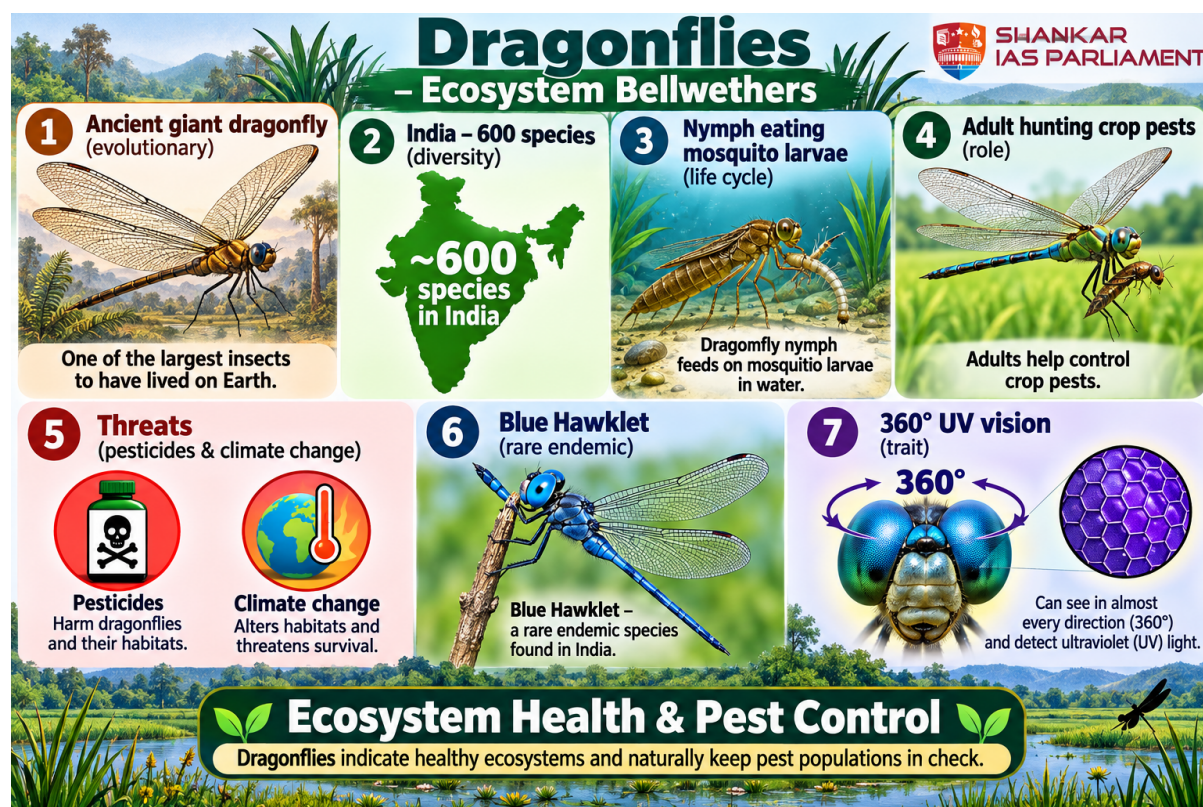
## Dragonflies - Ecosystem Bellwethers

*Prelims: Current events of national and international importance | Species*

### Why in News?

Recent studies on dragonflies highlight their distinctive 360-degree ultraviolet-sensitive vision.

- **Evolutionary Background** - These insects are among the earliest known flying organisms, originating approximately 300 million years ago.
- India is home to **approximately 600 species** belonging to the order Odonata, which includes both dragonflies and damselflies.



- **Distribution** - There is significant species diversity in the **Northeast and Western Ghats regions**.
- Recent ecological surveys indicate declining populations and the disappearance of certain species.
- For example, the *Blue Hawklet* (*Hylaeothemis apicalis*), which is endemic to the Western Ghats, is now rarely observed.
- **Life Cycle and Ecological Role** - **Aquatic nymphs** inhabit wetlands, ponds, and

streams.

- **Adult individuals function as aerial predators and possess four independently moving wings.**
- Nymphs consume mosquito larvae and crop pests, particularly in paddy fields.
- Adults prey on leafhoppers and other harmful insects.
- These species serve as indicators of **healthy ecosystems and sustainable agricultural practices.**
- **Threats** - The use of pesticides, particularly systemic compounds such as fipronil, has contributed to a decline in population numbers.
- Climate change has resulted in increased droughts and unpredictable rainfall patterns, which negatively impact endemic species.
- Additionally, these species are subject to predation by various other organisms.
- **Distinctive Biological Characteristics** - The species possesses **panoramic vision (360 degree)** facilitated by **more than 16 opsin genes**, in contrast to the four found in humans.
- It is capable of **detecting ultraviolet light** and exhibits a highly sensitive visual system.
- Ongoing research continues to uncover additional biological insights regarding this species.
- **Significance**
- They serve as indicators of ecosystem health, as their presence reflects the overall ecological condition.
- They contribute to pest management, particularly through the regulation of mosquito populations.

## Reference

[The Hindu | Dragonflies – Bellwethers of Earth’s Ecosystems](#)