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

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