

## INVASIVE ALIEN SPECIES [UPSC Notes GS III]

### Context:

Rajasthan Authorities are on alert after locust attack warning.

### What is desert locust?

- The desert locust (*Schistocerca gregaria*) is a species of locust, a swarming short-horned grasshopper in the family Acrididae. Plagues of desert locusts have threatened agricultural production in Africa, the Middle East, and Asia for centuries.
- The desert locust is an invasive species that is both well known and feared because of the large-scale agricultural damage it can cause.
- Desert locusts are a major pest on numerous crops and pastures throughout a vast area of almost 30 million km<sup>2</sup> covering Africa north of the equator, the Near East, the Arabian Peninsula and the Indian subcontinent. Like other locusts, desert locusts can switch from a solitary phase with low population densities during recessions (periods of calm), to a gregarious phase with high population densities during invasions, when hopper bands and swarms can devastate agriculture.

### Recent Issue

- In the wake of a locust attack threat from across the Pakistan border, authorities here have gone on an alert to deal with a swarm of the tropical grasshoppers entering India since the insects can devastate standing crops.
- However, the locust threat is only confined to nearby villages as the insect cannot fly long distances. However, it spreads with the help of the wind or desert storm which occurs during the summer season in the Rajasthan desert.
- After locust sightings in border villages around Jaisalmer, the Jodhpur-headquartered Locust Warning Organisation (LWO) has stepped up efforts to tackle any major attack by the grasshoppers by conducting a mock drill and is ready with an adequate stock of pesticides.

### What are Alien Invasive Species?

- An alien species is a species introduced outside its normal distribution. According to experts, alien species become 'invasive' when they are introduced deliberately or accidentally outside their natural areas, where they out-compete the native species and upset the ecological balance.
- The most common characteristics of invasive species are rapid reproduction and growth, high dispersal ability, ability to survive on various food types and in a wide range of environmental conditions and the ability to adapt physiologically to new conditions, called phenotypic plasticity.

### How Invasive Species are introduced?

The movement of people and goods around the world increases the opportunity for introduction of IAS. The most effective way to stop the negative impacts of IAS is through prevention of spread by regulating the trade or movement of a species. Once an IAS has arrived, early detection, monitoring and eradication can stop the species spreading.

## Negative Consequences of Invasive Species

- Invasive species can have a number of negative impacts on the areas that they invade. Perhaps the most significant of these is the widespread loss of habitat.
- Some invaders can physically alter the habitat in addition to destruction.
- Other invasive species may not destroy habitat but can have an impact by killing large numbers of endemic species.
- Invasive species can also impact human health. Invasive zebra mussels accumulate toxins in their tissues like PCB's and PAH's. When other organisms prey on these mussels, the toxins are passed up the food chain and can also enter animals consumed by humans.<sup>23</sup> Ballast water from ships also sometimes contains harmful bacteria like cholera. Invasive animals can also be vectors for disease.
- In addition to these impacts, invasive species can also have enormous economic costs. \

## Zoological Survey of India Report on Invasive Species

The Zoological Survey of India (ZSI) has for the first time compiled a list of 157 alien invasive animal species! This list excludes the invasive microbe species. The compilation was announced on the side-lines of National Conference on Status of Invasive Alien Species in India organized by the Zoological Survey of India and Botanical Survey of India.

### Highlights:

- Out of the 157 species listed by the ZSI, 58 are found on land and in freshwater habitat, while 99 are found in the marine ecosystem
- The 58 invasive species found on land and in freshwater comprise of 19 fish species, 31 species of arthropods, 3 of molluscs and birds, 1 of reptile and 2 of mammals
- Among alien invasive marine species, genus *Ascidia* accounts for maximum number of species (31), followed by Arthropods (26), Annelids (16), Cnidarian (11), Bryzoans (6), Molluscs (5), Ctenophora (3), and Entoprocta(1)

### Some commonly found alien species:

- African apple snail (*Achatina fulica*): The most invasive among all alien fauna in India, this mollusc was first reported in the Andaman and Nicobar Islands. It is now found across country and is threatening the habitat of several native species.
- Papaya Mealy Bug (*Paracoccus marginatus*): Native of Mexico and Central America, it is believed to have destroyed huge crops of papaya in Assam, West Bengal and Tamil Nadu.
- Cotton Mealy Bug (*Phenacoccus solenopsis*): Native to North America, it has severely affected cotton crops in Deccan
- Amazon sailfin catfish (*Pterygoplichthys pardalis*): This species is responsible for destroying the fish population in the wetlands of Kolkata.

### Other prominent cases in India in recent times:

1. Chilka Lake became degraded mainly through siltation and the choking of the seawater inlet channel, this resulted in the proliferation of invasive freshwater species, a decrease in fish

- productivity and an overall loss in biodiversity.
2. Invasive growth of the grass *Paspalum distichum* has changed the ecological character of large areas of the Keoladeo National Park, reducing its suitability for certain waterbird species including the Siberian Crane.
  3. In the Kanjli Wetlands the water hyacinth which was introduced is now invasive. From time to time it is removed using mechanical means.
  4. At the Ropar wetlands invasive weeds are also a concern and management plans are under development.

### Solutions already in Place:

- A Draft National Wetland Strategy has been developed with a clear focus on control of invasive species. Also, several initiatives have been undertaken under the Convention of BioDiversity to control proliferation of invasive species in wetlands and other aquatic bodies.
- Management Action Plans (MAP) have been formulated for 30 out of 66 wetlands identified for conservation and sustainable use. These MAPs have a focus on biodiversity conservation and restoration of ecosystem processes and functions. One of the activities carried out in association with these plans is the control of alien invasive species.
- The threat of invasive pest species gaining entry into India (imported plant/planting material) is addressed under The Plant Quarantine (Regulation of Import into India) Order, 2003, under the ICAR. However, the risk analysis for invasiveness of a plant species per se is not taken care of under this order.
- The Ministry of Environment and Forests issues approval along with quarantine certificates for the export of wild animals and articles under the Wildlife (Protection) Act 1972.
- The Destructive Insects and Pests Act 1914 aims to prevent introductions into India, and the transport from one province to another, of any fungus or other pest which is, or may be destructive to crops

### More Measures

As presently there is no exclusive legislation or policy in India to deal with the invasive alien species. It is necessary that robust steps are to be taken to face this menace. Possible actions include:

- Strengthening domestic quarantine measures to contain the spread of invasive species to neighbouring areas.
- Developing a national database on invasive alien species reported in India.
- Developing appropriate early warning and awareness system in response to new sightings of invasive alien species.
- Providing priority funding to basic research on managing invasive species.