

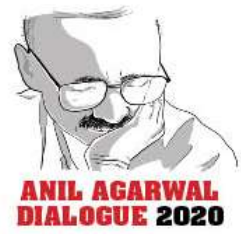
CENTRE FOR SCIENCE AND ENVIRONMENT



ANIL AGARWAL DIALOGUE 2020

**ANNUAL MEDIA CONCLAVE
ON THE STATE OF INDIA'S
ENVIRONMENT**

Locust invasion and climate change – a case study from Rajasthan and Gujarat



Locust invasion and climate change – a case study from Rajasthan and Gujarat

- What is locust invasion?



Locust invasion and climate change – a case study from Rajasthan and Gujarat

- Result of locust invasion:
 1. Famine
 2. disruption of trade
 3. abandonment of cultivation
 4. diversion of labour
 5. heavy expenditure on control measures and so on.



Locust invasion and climate change – a case study from Rajasthan and Gujarat

What is locust ?





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Solitary locust



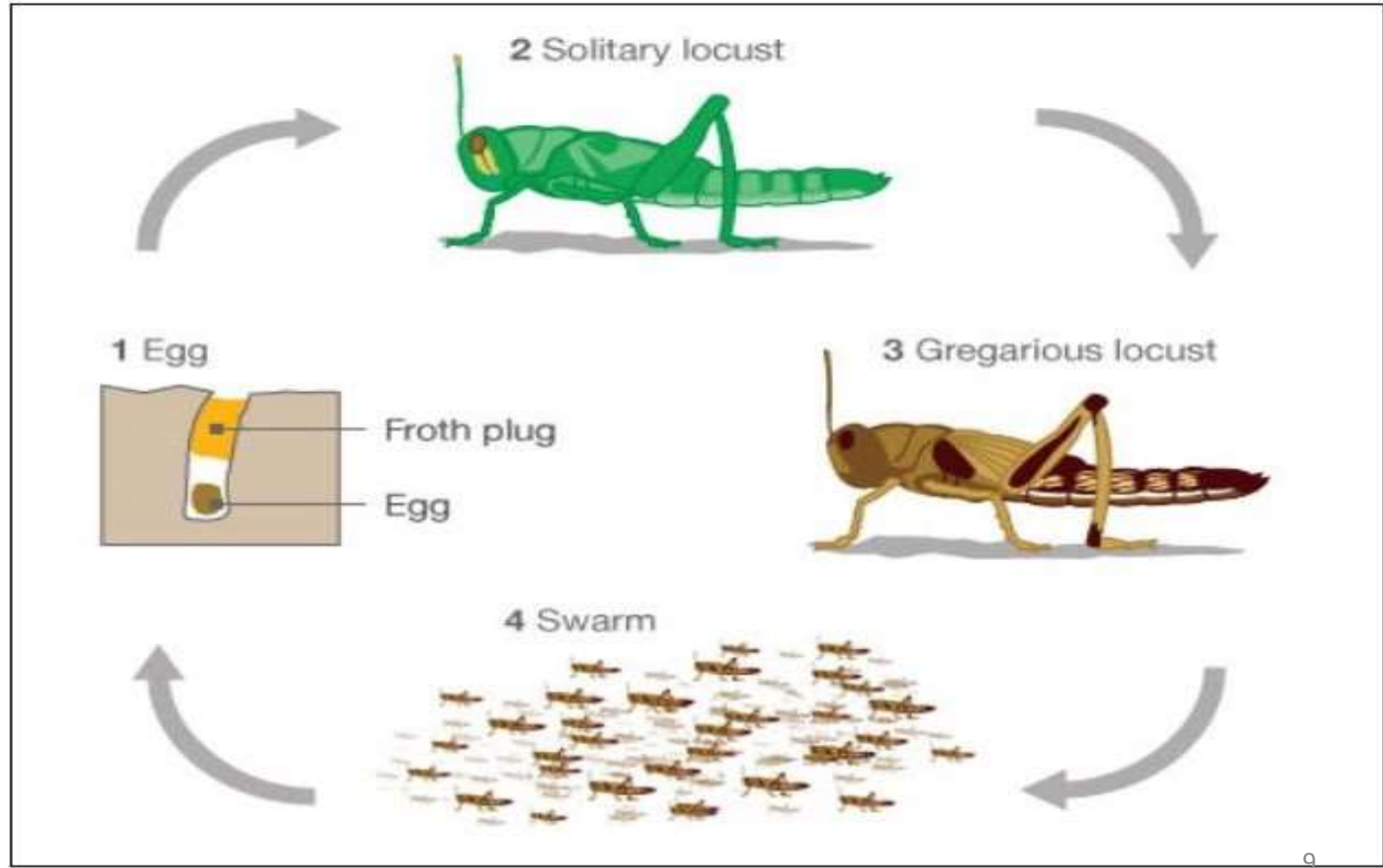
Gregarious pink locust



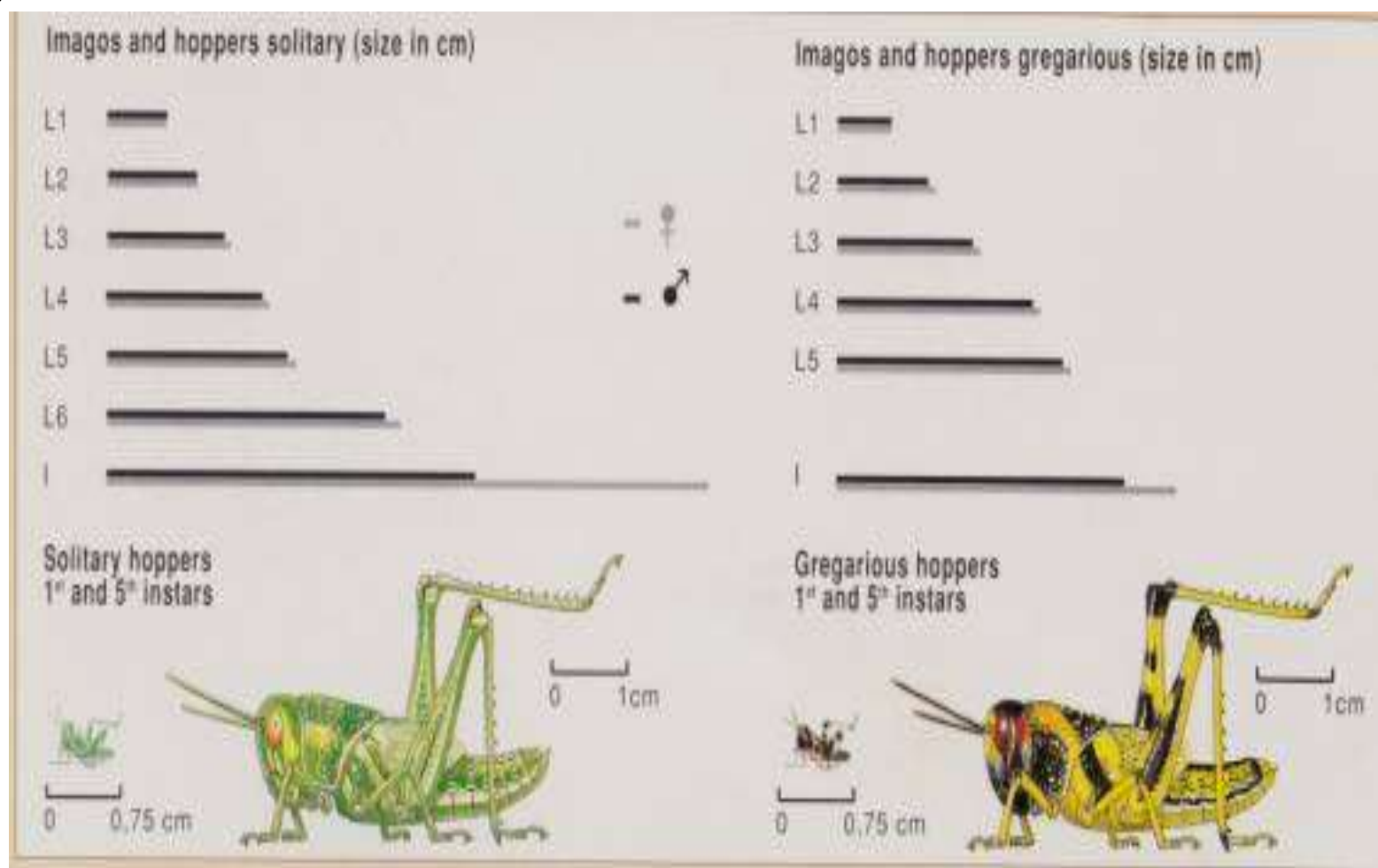
Gregarious yellow locust



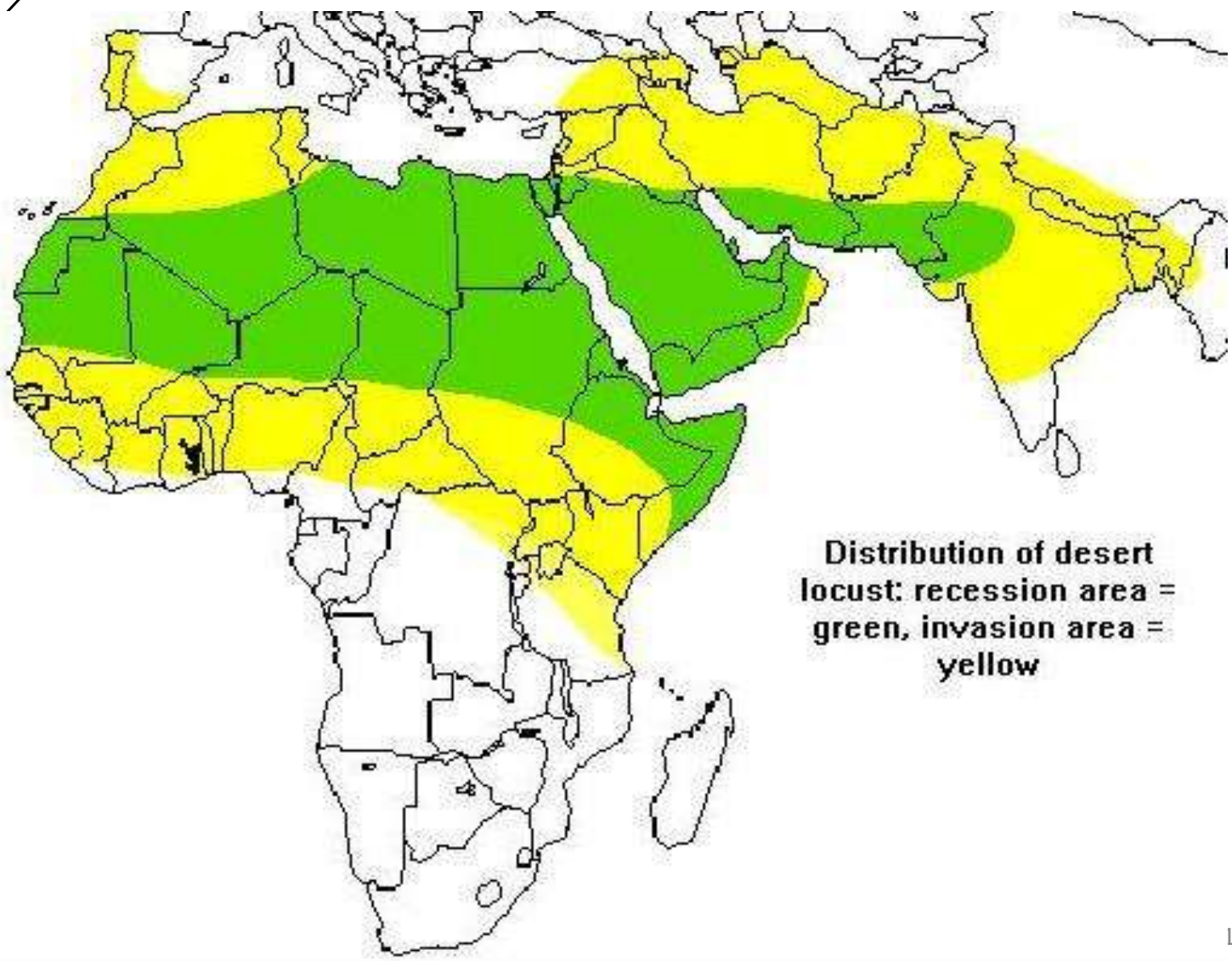
Life cycle of the desert locust



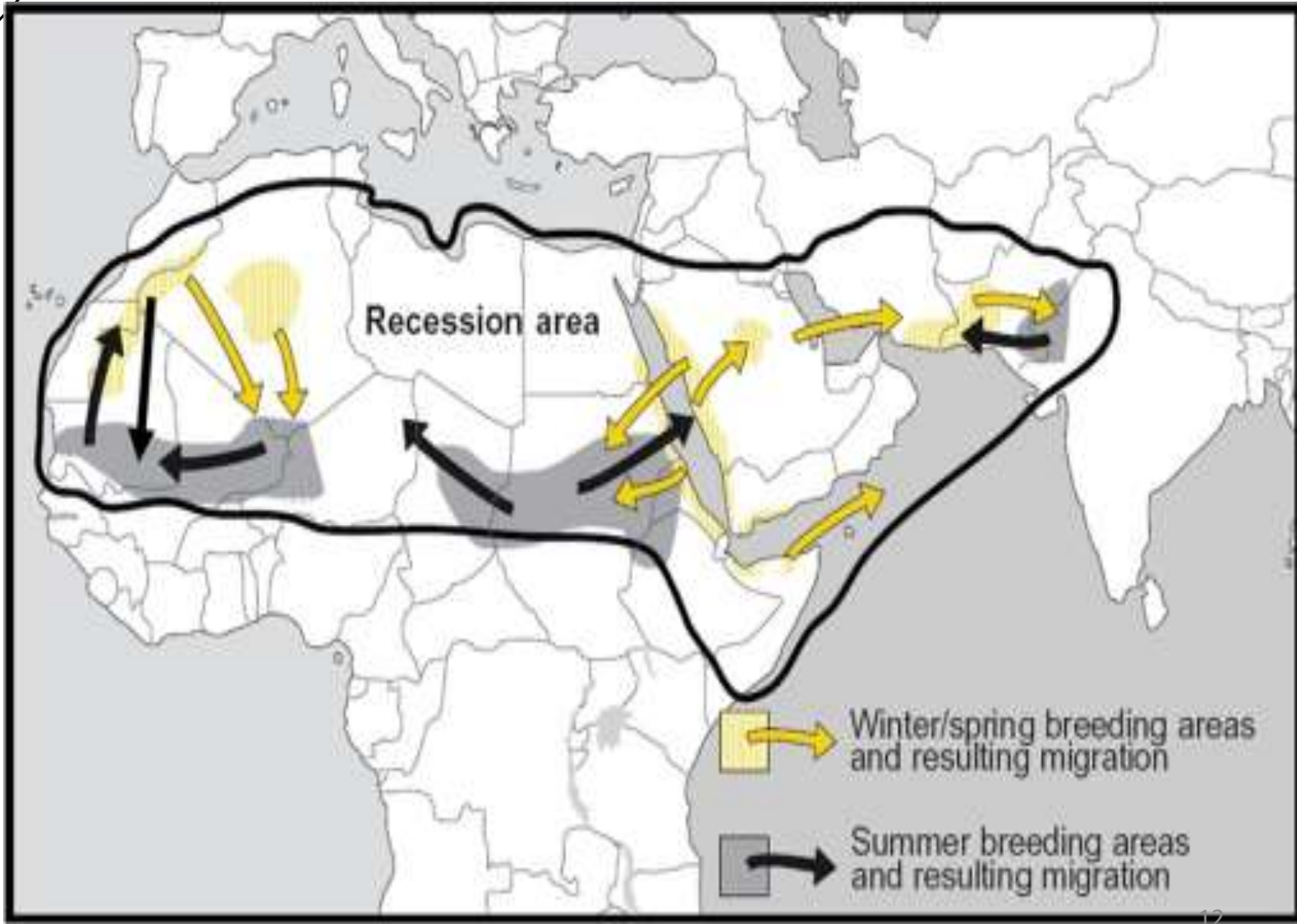
Comparison of solitary and gregarious hoppers



Desert locust distribution map



Desert locust distribution map



Five regions for desert locust monitoring and control

1. South West Asia Region—India, Pakistan, Iran and Afghanistan.
2. Near East Region—Iraq, Jordan, Kuwait, Lebanon, Saudi Arabia, Syria, turkey, Egypt, United Arab Republic, Bahrain, Yemen Arab Republic and the People’s Republic of Southern Yemen.
3. East African Region—Ethiopia, Djibouti, Somali Republic, Sudan, Kenya, Tanzania and Uganda.
4. Northwestern African region—Algeria, Libya, Morocco and Tunisia.
5. West African Region—Chad, Dahomey, Cameroun, Gambia, Ivory Coast, Mali, Mauritania, Niger, Senegal and Upper Volta.

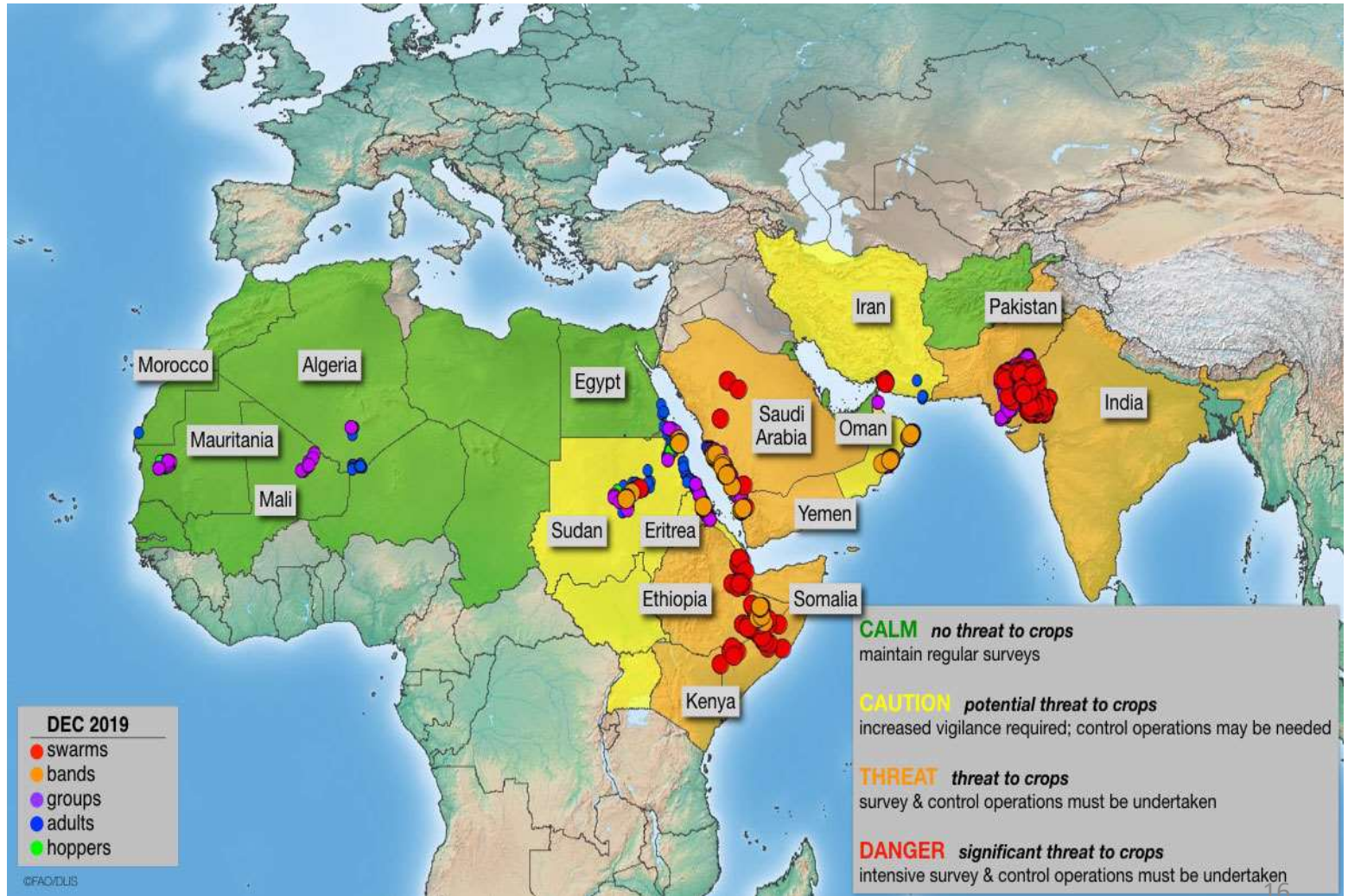
Main breeding seasons:

- I. Winter-breeding (November-December)
- II. Spring breeding (January-June)
- III. Summer breeding (July-October)

Seasonal migration:

- Seasonal migration of the desert locust is influenced by the climatic factors such as
 - Temperature
 - wind and
 - vegetation.

Locust situation in the world



Locust situation in India

- During the 2nd fortnight of January, 2020, immature/maturing swarms/adult were observed in the Jaisalmer, Barmer, Bikaner, Jalore, Nagaur, Jodhpur, Sriganganagar of Rajasthan and Palanpur of Gujarat. Total area cleared 392093 ha area.
- The control operation is underway against the invaded summer-bred residual population at Sriganganagar, Barmer, Jaisalmer and Jodhpur. Since the ecological conditions are not favourable, the infestation is expected to be reduced by coming days, if new incursion is not reported.

Climate change in Thar desert

- Rainfall distribution
- Temperature
- Relative humidity
- Sunshine duration
- Wind velocity and
- Evaporation characteristics

Climate change in Thar desert

- The earth has warmed upto one degree centigrade during the past century due to
 - 1. Anthropogenic build up of carbon-di-oxide
 - 2. Infrta-red absorbing trace gases
 - 3. Water vapour

Climate change in Thar desert

- The precipitation will increase in the monsoon region of Asia due to
- future CO₂ emission from energy sources
- cement production and
- deforestation. And this had happened in 2019 when cyclones brought heavy rainfall in the western states in India .

Climate change in Thar desert

- Temperature is rising during days and nights resulting in
- rising sea levels
- timing and intensity of precipitation leading to unusual floods mainly in coastal areas and
- mid-term or severe drought in other regions

Climate change in Thar desert

- Climate change affects all types of animals and the damage they cause is directly influenced by their reproduction, development, survival, spread, or altering host defenses and susceptibility. Indirectly, climate change impacts the relationships between pests, their environment and other species such as natural enemies, competitors, vectors and mutualists.

Climate change in Thar desert

- The exploitation of natural resources at the fast rate involving initiation of large scale developmental schemes, multipurpose projects, different types of land use, new farming systems and other agroforestry practices have considerably altered and disrupted the environment of local insect faunal and pathogen complexes

Climate change in Thar desert

- Temperature can strongly influence the life cycle and fitness of ectotherms, such as insects as they rely on external heat sources and sinks to regulate their body temperature. In insects, temperature influences food consumption, developmental rates, distribution, population size, outbreaks and migration, larval emergence and the number of generations/year.

Methods of control

- Traditional control methods:
- Spraying involves using a sprayer to atomize a liquid pesticide which is then distributed over the target area.
- By using drones.

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Thank You

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