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# The eighth plague: When locust swarms overran Karnataka

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Arthashastra, the ancient Indian book of statecraft, lists eight kinds of calamities, itis, that besiege crops — excessive rain, droughts, locusts, rodents, fire, tigers, birds and an enemy who destroys your crop out of spite. Many of these iti-s have converged in India in the last few days. India is seeing a surge of extreme weather events - a super cyclone, heat waves, forest fires, and to top it all up, a locust outbreak.

Locusts, the ravenous, short-horned cousins of grasshoppers have descended upon parts of Rajasthan, Madhya Pradesh and are steadily wherever the wind takes them.

Midathe in Kannada is a grasshopper as well as a locust, but when used with daali (onslaught) or haavali (infestation) it only means the latter. A fistful of locusts (about 100

g) eats as much as eight grown men would per day, and each swarm has a few tonnes worth of locusts. Of the ten known species of locusts, the one currently wreaking havoc across East Africa, parts of the Arabian Peninsula, Iran, Pakistan and now

India is the desert locust (*Schistocerca gregaria*). Pakistan has now declared a state of national emergency due to widespread depredation caused by these polyphagous insects.

Some sense of the kind of devastation left by a cloud of locusts is conveyed by Francis Buchanan, a surveyor of the English East-India Company. Traversing through the dominions of Mysore Maharaja in 1800, he was “investigating the state of agriculture, arts, commerce; the religion, manners, and customs; the history, natural and civil, and antiquities”. On May 16, while passing through Mandya in Karnataka, then a “poor village fortified by a mud wall”, Buchanan noticed “a long narrow red cloud near the horizon which was continually varying its shape”. This narrow red cloud he estimated was about five kilometres long, a hundred meters wide and fifteen meters tall. This was followed by a “loud noise that somewhat resembled the sound of a cataract”. He added that the swarm “passed west to east in the direction of the wind at the rate of six or miles an hour. The whole ground and every tree and bush covered with them; but each individual halted for a very little time on any one spot. They went in a very close body, and behind them very few stragglers. In an hour after the flock passed, few were to be discovered in the neighbourhood of town”. He also reports that a similar swarm the previous year had devoured every blade of jowar in sight.

Descriptions of the devastation caused by the locusts are found in later accounts as well. A colonial official monitoring the famine of 1878 in South India reported that the locusts “leave no trace of green behind them and give the country over which they pass the appearance of a desert”. He must have reflected on the aptness of their name ‘Locusts’ - from the Latin *locus ustus* meaning ‘burnt place’.

Following the widespread destruction caused by the locust outbreaks, in 1939 the British colonial administration instituted in 1939 one of the world’s first organizations dedicated to monitor and manage locust infestations, the Locust Warning Organisation (LWO) in Karachi (now based in Jodhpur). Since then, systematic attempts have been made to collect information about locust distribution and behaviour.

A major breakthrough in our understanding of locust outbreaks came through the work of the Russian entomologist Boris Petrovich Uvarov in 1921. Until then, researchers knew two subspecies of locust, the harmless *danica* and the marauding *migratoria*; with much of the research on locusts centered on *migratoria*. Uvarov observed something very surprising, the seemingly different sub-species were in fact different developmental phases of the same species. The *danica* locusts appeared to lead solitary lives and did little harm to the crops. Under conducive weather and environmental conditions, the same *danica* locusts breed rampantly, grow in size, turn darker, become aggressive, and change into what was originally thought to be a different species. They also drop their unsociable behaviour and form aggregates. The resultant swarm behaves nothing like the individual locust. As the swarms swell in size, they invade neighbouring areas ravaging every green particle in sight.

What triggers the transformation from harmless loners to the apocalyptic mob? The roots of the current locust outbreak in India can be traced back to cyclonic storms that hit East Africa in 2018, which in turn can be traced to warmer sea surface temperatures in the South-western Indian ocean. And why was the sea surface temperatures warmer than usual? Climate change. Scientists have warned that climate change will impact “the timing, location and extent of locust outbreaks in ways that are presently unpredictable”. Rising temperatures and erratic rainfall coupled with social inequities, weak institutions and rampant environmental degradation are a potent concoction that predispose us not only for locust outbreaks but for every other kind of iti including those yet unknown.

*(Lingaraj G. Jayaprakash is a Researcher, Sustainable Futures Research Laboratory McGill University, Canada. Sashi Sivramkrishna is with FAIR, Bengaluru, and has been retracing Buchanan's Journey for over a decade now.)*