

## **Of Insects and Insecticides: Locust attacks in South Asia**

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### **Summary**

*Swarms of desert locusts have entered India and Pakistan endangering livelihoods and leaving many without food. Excessive rainfall, as a result of climate change, is responsible for the veritable invasion of locusts. Measures undertaken by both governments and international organisations have shown considerable potential but they require more attention.*

Swarms of desert locusts are making their way across India and Pakistan. The early onset and worsening of swarms this summer is attributable to climate change. The swarms pose a serious threat to livelihoods and food security and are exceptionally devastating for the two neighbours where more than two-thirds of the population rely on agriculture for their livelihood, forming a fifth of their respective gross domestic product.

Locust swarms, however, are not a new phenomenon; they generally make their way to India through Pakistan during the monsoon season. This summer's infestation, however, is said to be the worst India has seen since the early 1990s. In India, locust outbreaks have occurred in Gujarat, Punjab, Maharashtra, Madhya Pradesh, Rajasthan and Uttar Pradesh, with the latter three states being most affected. Likewise, in Pakistan, a state of emergency was declared this February due to locust swarms in Sindh, Punjab and Balochistan. The arrival of swarms into India coincides with the start of the monsoon season which imperils crops typically harvested during the summer. Similarly, in Pakistan, the Food and Agriculture Organisation (FAO) estimates a US\$2.9 billion (S\$4.04 billion) loss in summer yield from these swarms.

Rising ocean temperatures, given climatic shifts, are largely responsible for this sudden locust influx. A phenomenon known as the Indian Ocean Dipole, which causes the differential warming of the western and eastern parts of the ocean, has caused excessive rainfall. After rainfall, arid soil across dry terrains becomes waterlogged which provides locusts the optimal breeding ground to proliferate. Rains from several cyclones in the Eastern Africa and Arabian Peninsula since mid-2018 have accelerated locust breeding. Cyclone Amphan, in late May 2020, has further exacerbated the problem. Strong winds from the cyclone have pushed locust swarms towards Madhya Pradesh.

The collective response to these locusts has been agile. A number of organisations are working to control the swarms, namely the FAO, the World Bank's Emergency Locust Response Program (ELRP), the Locust Warning Organisation (a subset of India's Ministry of Agriculture) and other state and local governments across India and Pakistan. Currently, both the FAO and the ELRP are concentrating their funds and resources on the East African countries that are most affected and strapped for resources.

Concurrently, the Indian government has responded with force. New Delhi provided drones to spray pesticides and procured high powered spraying equipment that can be fitted on Indian Air Force helicopters. Various local governments are using fire engines and tractors to spray water and pesticides to control the swarm. They are also encouraging farmers to burst firecrackers, play loud music and beat drums to wean insects away from crops. Pakistan has received assistance from China and Turkey which have provided equipment such as vehicle-automated sprayers, protective clothing, masks and malathion pesticides. India has also extended similar assistance to Iran and Pakistan to supply them with pesticides. Interestingly, the Narendra Modi government, despite animus with its Pakistani counterpart, has proposed further cooperation with Pakistan beyond annual joint border meetings and monthly meetings between officials during the summer months. However, the specifics of how this overture will manifest remains unclear with Islamabad yet to respond.

So far, pesticides have controlled the swarms. Nearly 70 per cent of the locusts in Rajasthan have been eliminated by drones that dropped pesticides on fields. Though effective, side-effects associated with the use of pesticides, especially in sizeable quantities, are detrimental to human and environmental health. Chemical-free measures, such as bio-pesticides, should be considered as part of a comprehensive locust control plan, particularly near areas with large populations and water-bodies. One environmentally friendly bio-pesticide called 'Green Muscle' targets the locusts without harming other forms of life. Another chemical-free remedy that farmers could use is to treat their crops with neem, a natural herb, which could repel the locusts.

As climate change worsens, locust swarms could become more frequent which might behoove India and Pakistan to mull long-term methods of locust control. Both countries can do more. For example, enhanced data collection could help predict and control the swarms more effectively. This exercise, however, would necessarily involve communities to generate data to allow for real-time tracking of swarm movements. Collecting soil moisture data may help predicting swarm surges which could give officials and farmers time to prepare and procure necessary resources to deter fresh swarms.

The COVID-19 pandemic and the lockdown that followed has slowed down the eradication of locust swarms due to a decrease in the availability and transportation of pesticides and labour. A more focused ground-level cooperation between affected countries in South Asia, Middle East and East Africa could help control existing swarms and prepare for future ones. India and Pakistan should also adopt a proactive approach to predict, control and eradicate future locust swarm attacks. This process involves empowering bottom-up mechanisms, sustained cooperation with farmers, emphasis on prevention control and expanding research and development into technologies that can predict and eliminate locust swarms. Then perhaps, the summer of 2021 might not be a locust-infested one for India and Pakistan.

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