IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

LOCUST INVASION IN INDIA

ABRAR HUSSAIN

Department of life science Rabindranath Tagore University M.P Bhopal 464993

Abstract

The present thesis entitled locust invasion in India. The basic idea behind the selection of this research topic relies in the pathetic condition of the people suffering from economic losses of the agricultural sector caused by the locust attack. The problem of huge grain loss faced by the poor farmer unable to efforts costly chemical pesticides. All these problems are deep rooted in the heart and mind of researcher, drew their concentration to conduct research in this direction and also to bring awareness among people towards proper utilization of resources as well as to promote their conservation and cultivation.

Large out breaks often promoted by climate change continue to occur in many part of India. locust are most dangerous agricultural pests. Their control is critical to food security worldwide and often requires governmental or international involvement. Although locust outbreaks are better controlled and often shorten in duration reduced in extent.

Keywords -----Locust outbreak, Monitoring, Impact and Preventive Management Strategy

INTRODUCTION

As the nation is reeling under the effects of Covid-19 Pandemic, India has to fight another menace: Locust invasion. Massive swarms of locusts have devoured crops across seven states of western and central India including Rajasthan, Gujarat, Madhya pradesh and Haryana, Maharashtra, U.P and Punjab. The locust population might grow 400 times larger by end June 2020 and spread to new areas without action.

The Swarm first arrived in the horn of the Africa at the end of summer 2019. They have moved in the Arabian desert where good breeding condition in the month prior accords had allowed them to multiply by an Astonishing 8,000- fold according to UN Food and agriculture organization (FAO)

In the autumn months of 2019 the insect spread further inland from Somalia and Ethopia into countries including Kenya and Uganda. At the same time the Locust moved from Arabian Desert and middle East Kuwait and into parts of Asia such as India and Pakistan.

Last big outbreak in India . The last big infestation was in 2010. There were 13 locust plagues between 1964 and 1997. From 1997 to 2010 . There were five outbreaks that were controlled from 2010 to 2018 there were no major swarms or breeding reported according to locust warming organization (LWO) in Jodhpur India.

What exactly are Locust?

Locust is an insect which is quite similar to grasshopper and crickets and belong to the family of grasshoppers called Acrididae that have a swarming phase. These insect are usually solitary but under certain circumstance they become more aboundant and change their behavior and habits become gregarious but the outbreak of locust species in India is Desert Locust (Article Id: 30260) Manish Kumar J-Joshi, Prithiviraj v, Chandresh B-Solanki, Berari Vaishali v, Department of Entomology, CPCA S.D, Agricultural university, Dantiwada, Gujarat (India)

Binomial name:	**Schistocera gregaria**
Kingdom	Animalia
Phylum	Arthopoda
Class	Insecta
Order	orthoptera
Suborder	Caelifera
Family	Acrididae
Sub family	Cyrtacanthacridinae
Genus	Schistocerca
Species	S. gregaria

An invasion by desert locust has hits large swathes of India in the middle of coronavirus Pandemic. Large and aggressive swarm of these crop devouring short horned insect have invaded many district of India and covering more than 5,0,000 hectors of area of western India. The desert locust the world most destructive migratory pest are known to change their behaviour and form swarms of adults or bands of hoppers (wingless nymphs, pastures and fodders. A single swarm of deserts locust contain up to 40-80 million adult in one square km and thus can travel up to 150 km per day.

Phase of Locust: The phases can be distinguished by difference in coloration, form, physiology and behaviour. It exist in two phases:

(1) Solitary phase

(2) Gregarious Phase

1. SOLITARY PHASE:- These form are which it present alone, then it looks some what like this Fig 2. This is called solitary phase. A solitary phase nymph for examples, adjust its coloration to match that of its surrounding, does not collect in groups, has low metabolic and oxygen intake rates, and is swaggish.

2. Gragarious Phase:- A nymph of solitary phase- locust matures in the presence of many other locust, it undergoes a physiological change and producing offspring of gregarious type. When it present in crowds and the environmental condition are congential e.g wet soil after recent rain with trees and plants in full bloom they can transform forms completely, they someone like this Fig 3. This is called gregarious phase.

A gregarious phase nymph has black and yellow or orange coloration in a fixed pattern gathers in large groups has high metabolic and oxygen intake rates and is active and nervous. This metamorphosis of form changes everything about them their behavior , habits and appearance. Everything is different in solitary and gregarious phase . The swarm of gregarious phase can travel up to 150 km per day in the direction of wind at the same wind speed. So we do not have a problem with their solitary phase. A problem arises when they exist in crowds and are in their gregarious phase.

Their eating habits change in this phase. They can eat more food. Their endurance increases and their movement become more rapid even their brain since become larger. These swarm of locust destroy everything in their way such as creals, shoots, flowers, seeds stem and barks.

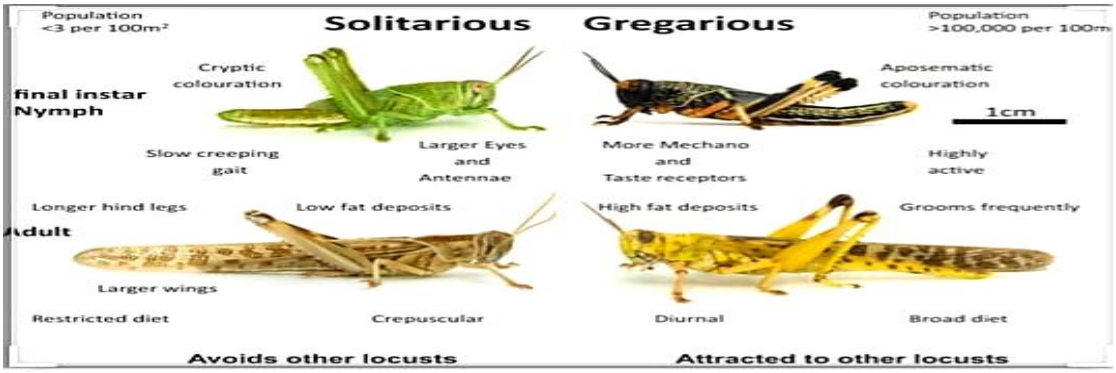
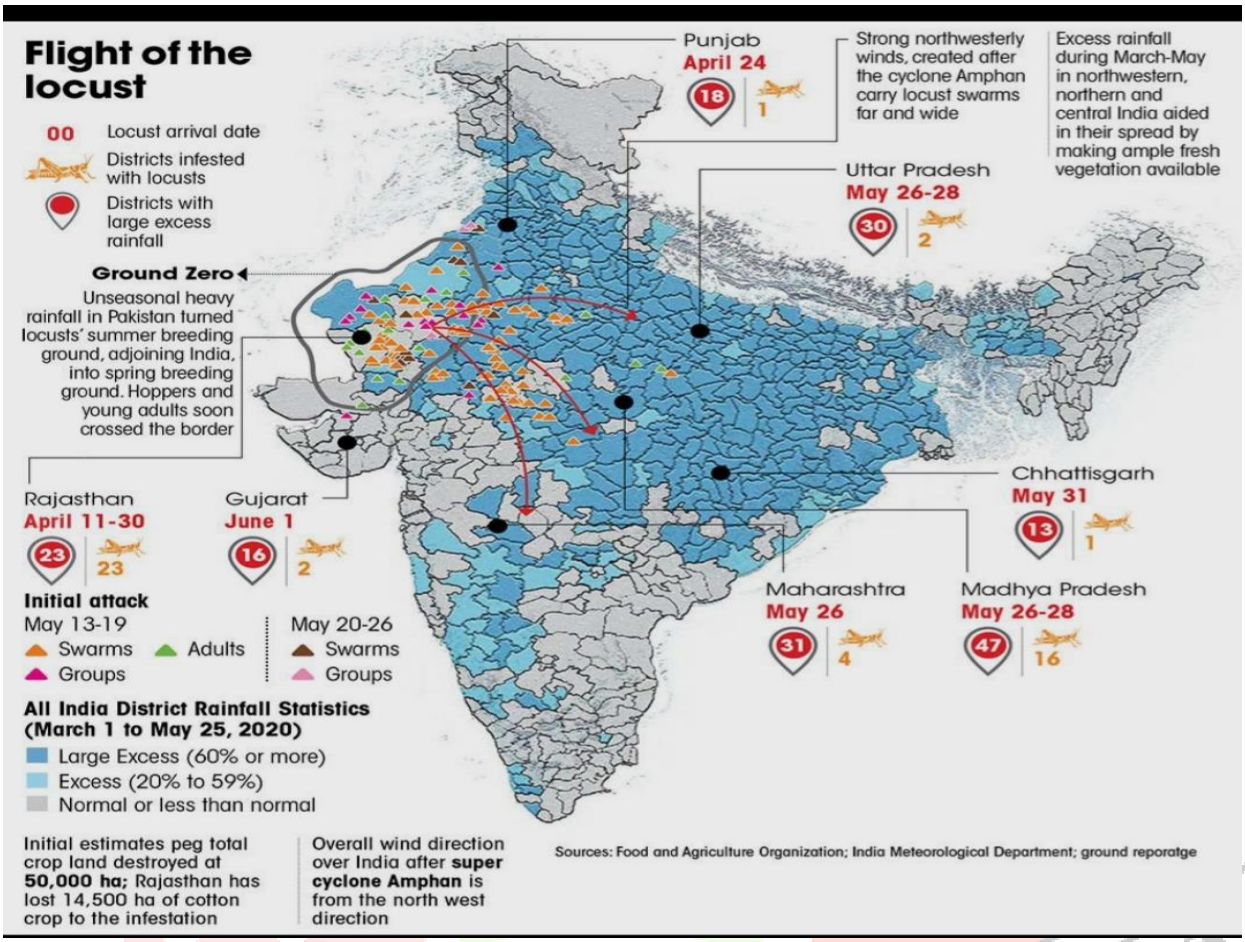


Fig 2 and 3

HOW SWARM MOVED IN INDIA



Recent Cause of outbreak of Locust in India:-

Spread of the outbreak from East Africa:-

The key driver of current locust plague is climate change. The above average rainy season in East Africa region created favourable condition for locust to breed torrential rain hits east Africa around the time of December 2019. Infact there were floods and cyclones as well East Africa including Kenya, Uganda, Ethiopia, Somalia. These countries were badly effected flooded during Dec. 2019 due to floods and torrential rains congential environmental condition, such as rain, moist soil and vegetation created fro the locust. The current outbreak in East Africa has been described as extremely dangerous by Food and Agricultural organization (FAO) of united nation and it puts food security and livli hood at risk. According to food and agricultural organization (FAO) 2nd generation had already been hatching and the third generation will be ready by the harvesting season towards the end of July 2020.

Effects of Climate change:-

Climate change is indirectly held responsible for the locust attract happening today. The sequence of events of how it actually happened is very intercasting. The Indian ocean is warming up more than usual due to climate change. The rain become more extreme dur to enhanced heating of ocean. A pattern of warming in Indian ocean may be trigger. A phenomenon is called the Indian ocean dipole in which the western and eastern part of ocean warm differentially tends to have an outsized impact in bringing excessive rains to India and west Asia. The Indian ocean dipole was so strong that it overrode concern of a drought in India last June 2019 and brought torrential rainfall, contained in several parts os west Asia, Aman, Yeman, in the horn of Africa, Ethiopia, Somalia and Kenya so

much so that the dry sand become heavily moisture, laden facilitating the formation of several locust swarm which the

Dipole was begning to take shape by late 2018 and locust outbreak was growing in Africa increased last year. Due to favourable wind it helps it helps swarm to fly and breeds in traditional grounds in Iran, Afganistan, Pakistan and India. Keith cressman, senior locust forecasting officer Food and agricultural organisation (FAO) said adverse weather condition are directly linked with Locust plague.

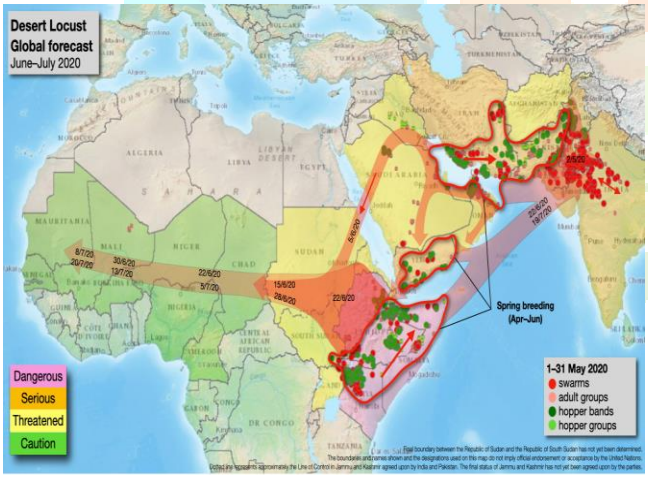
Environment Condition:-

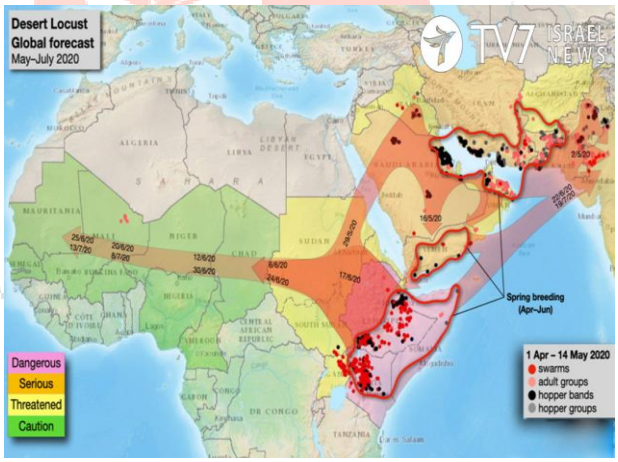
The soil become moist and there is aboundant vegetation around due to rains, so this becomes a great opportunity for the locust to breed and change into the gregarious phase. So the locust began to breed in huge numbers there and a plague hits east africa so around February 2020.

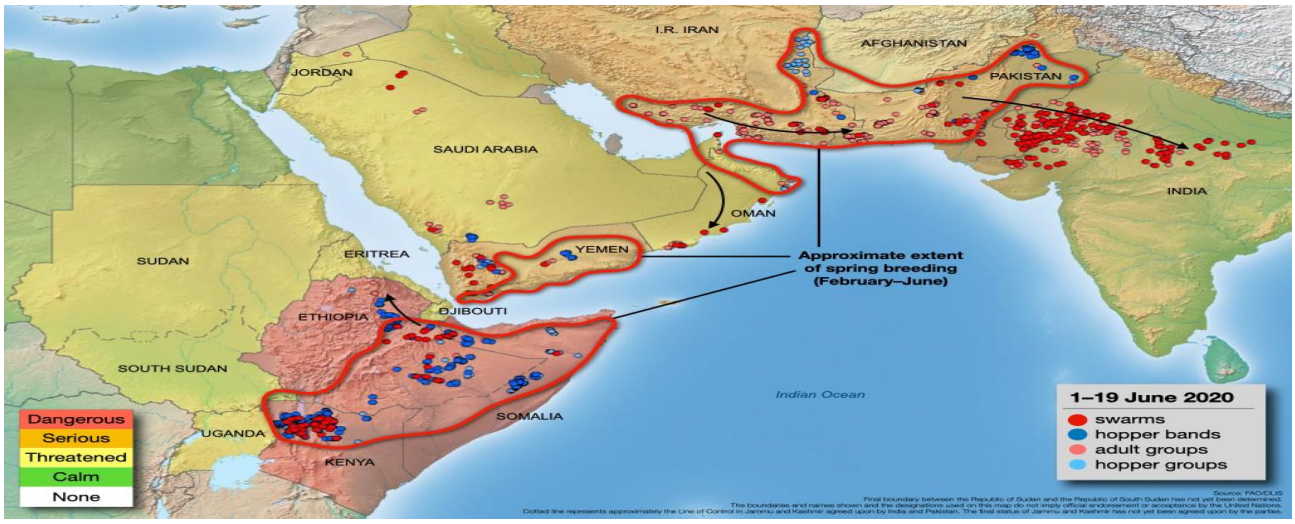
Cyclone Amphan Impact:-

The winds of cyclones that had hit the shores and it caused changes the wind direction and in such a way that they were further pushing the swarms of locust towards India. They would not have normally travelled they further moved in this direction because of cyclone winds and this is enertiny a very negative influence on Madhya Pradesh U.P, Rajasthan, Delhi and Haryana.

How the swarm moved from East Africa The following maps of food and agriculture organization of the united nation tells the story of recent spread of locust spanning two continent







Impact on Agricultural Sector in India:-

India is battling its worst desert locust swarm that entered much of western India from Pakistan and destroyed crops in many states such as Rajasthan UP and MP. Locust swarm devastate crops and cause major agricultural damage which can lead to farmine and starvation. Locust devour leave flowers, fruits, seed bank and also destroy plants by their weight also destroy plants by their weight also destroy plants by their weight as they descent on them in massive number.

Affection Former:- This means that locust not only devour valuable standing crops but can also devastate livelihood of farmers and those associated with agricultural supply chain. Threat to vegetables:- Locust adult can eat their own weight every day. they two gram of fresh vegetation pen day.

Major Economic loses and impact on crops:- The locusts damage crops with Rs 10 crore in 1926-1931 plague cycle. During 1940-46 and 1947-55 locust Plague cycle the damage was estimated Rs 2 crore and Rs 50 lakh during during 1959-1962 locust plague cycle. Farmers are very flabbergasted and embrassed because Locust current attacked on standing mustard, cumin, and wheat crops in their field. The ministry of agriculture said that presently three villagesof Gujarat, Banaskantha district which share border with Pakistan desert area came under fresh locust attack in Jan 2020. In Gujarat Locust damaged crops mainly cumin seed platue of about 17000 hectares, parts of western Rajasthan have destroyed crops spread of at least destroyed crops spread of at least 350000 hectares of land.

State wise comparision on impact of locust attack on crop in various district(April-June)

States	District affected by locust	Infested crop area
Rajasthan	Sri Ganganagar	4500 hectares (cotton crop)
	Naguar	70 hectares (cotton crop)
	Bikaner	830 hectares (cotton crop)
	Hanumangarh	9000 hectares (cotton crop)
	Chittorgarh	Total 14400
	Karauli	
	Swaimodhopur	
	Jodhpur	
	Jalawar	
	Jaisalmer	
	Barmer	
	Jaipur	
	Churu	
	Sirohi	
	Bundi	
	Sikar	
	Pratabgarh	Total 90000 Hectares
	Dholpur	

Gujarat	Banaskantha	
	Mehsana	
	Sabakantha	
	Amreli	
	Pattan	
	Bhuj	
	Surendarnagar	2500 hectares
Maharashtra	Amravati	
	Wardha	
	Nagpur	5-6 hectares
M. P	Mandsaur	
	Nemuch	
	Seopor	
	Morona	
	chatarpur	
	paana	Total 15000 hectare

U.P	Jhansi	
	Mahoha	
	Hamirpur	
	Agra	
	Aligarh	
	Mathura	
	Bulandshahr	
	Kanpur	
	Lalitpur	
	Farrukhabad	

Haryana	Rewari	
	Jhajjar	
	Sisra	
	Charkhi Dadri	
	Bhiwani	
Punjab	Fazlika	
	Mukhttsar	
	Bathinda	

Preventive strategy:-various countries effected by the desert locust generally adopt a preventive control strategy for the management of desert locust, in order to reduce the frequently , duration , duration, and intensity of plagues. To minimize the determental effect on live stuck fodder banks and human crop hand locust are controlled by various method.

1.Spraying Insecticides and pesticides:-

The first and most common solution adopted by most of the countries is simply spraying them with pesticides and insecticides either on the ground or in the air with the help of helicopter and then they would die. The problem with the solution is that this has a lot of negative impact sprayed pesticides has a negative impact in general on the environment, the people and their food and atlast pesticides need to be sprayed in huge quantities in order for to shows effect.

2. Eco- Friendly Pesticides:- Another solution could be the use of eco-friendly pesticides. But experts have observed that ecofriendly pesticides do not harm the environment and do not kill them effectively. They take some time to show effect.

3.Loud Noise:- The third step we can use loud noise. The locust free from any kind of noise, DJs, music, on loud speaker or any kind of loud noise make them scrapper, because noise make them scrapper, because at very high volume, bursting fire cracker, burning tires and throwing stones to drive the locust away. This is a solution that our farmers have implemented. Not a long term or scalable solution but the problem with this solution is abovious. It can be implemented on a very short scale.

4 Use drones and Tractors:- we can use tractors to spraying Malathion is not always effective in far flowing desert areas where tractor cannot move across sand dunesor reach out to the height of certain trench rendering the spraying ineffective. The Govt.must use drones or aircraft to spray Malathion over locust swarm for effective result.

5.Use Locust as a chicken feed:-This is another unique and interesting solution. This solution was tested out in a small scale in Pakistan Okera district. Basically the Govt agricultural organization asked the farmers to trap these locust and collect them and submit in bags. They would be paid in return of these locust would be milled and used as chicken field. That is they would basically become food for chicken and help in feeding them. Because locust are extremely a great source of proteins. Now this solution is extremely innovative. The farmers are also making profit in the form of money given to collect them and it is also generally profit when it is being used as a chicken feed.

Conclusion and summary:- In the middle of corona virus pandemic India has to fight another battle against the swarm of locusts that have entered western parts of India. They have already made their way to Rajasthan, Gujarat, Madhya Pradesh, Maharashtra and U.P.

These desert locust are voracious eaters and are now multiplying at an astonishing 400 times their usual rates, thanks to favourable climate conditions. Swarm of locust are threatening to be the next by problem for agriculture in India, especially western India. If not managed properly this can lead to a major problem of food security of the country.

Loss of pasture land will cause great distress to nomadic communities, banzars, and people who depend on animals for their livelihood. Generally they are at the bottom of pyramid. Their interest must be safe guarded first.

The Govt. is aware of the risk of swarm invasion as the country faces onset of the seasonal monsoon . While the centre , state govt. and stake holders have initiated a no of actions an integrated battle must be fought to win over this locust invasion.

ACKNOWLEDGEMENT

All praise be to Allah- The Almighty, only with whose divine mercy and blessing it became possible for me to climb the ladder of education to this level.

At this juncture of time, where I am given an opportunity to convey my gratefulness to all those have helped me to sail through the sea of education. I would first like to convey a deep sense of gratitude, to my parents whose tale of lengthy struggle, sacrifice, trust, and dedication had made it a reality for me to see the doorstep of a higher learning institution.

I owe immense admiration and indebtedness to my Research Supervisor, Dr. Pragya Shrivastave, Post Graduate Department of Zoology, University of RNTU M.P Bhopal, for providing unwavering guidance, persistent encouragement and priceless suggestion to complete the present work. I am fortunate to be under his unlimited source of knowledge, skill and perfection she desires in his work and sees in his students. Words cannot express gratitude for her.

I feel highly elated to express my sense of gratitude to Prof. Saleem Ayaz Rater, Head Department of Zoology Govt Degree college Thanamandi for providing incalculable help and unswerving encouragement during the course of present work. Thanks also Shahnawaz sir for their words of encouragement and valuable suggestions for time to time. My special thanks to my friends Mr. Mahaveer prasaad mena from Rajasthan Sharaan Ahmed from Gujarat and also greatfulness to my friends Sajid Ali, Azhar Javaid, Rashid Manhas Amin Mirza and Abdul Haq bahar for his blessing supports encouragement and cooperation throughout the course of study.

Bibliography

Desert Locust (Schistocera gregaria F.) Outbreak in Gujarat (India) Article Id: 30260 Manishkumar J. Joshi1 , Prithvi Raj V.1 , Chandresh B. Solanki1 , Birari Vaishali V.1 1Department of Entomology, CPCA, S.D. Agricultural University, Sardarkrushinagar, Dantiwada, Gujarat (India) – 385506.

1. The World Bank Group And The Locust Crisis, available at:https:// www.worldbank.org/en/topic/the-world-bank-group-and-the-desertlocust-outbreak

2. Contingency Plan for Desert Locust Invasions, Outbreaks and Upsurges, Ministry of Agriculture & Farmers Welfare, Government of India available at: http://ppqs.gov.in/sites/default/files/contingency_plan_0. pdf

3. Frequently Asked Questions (FAQs),Desert Locus Information Service available at: http://www.fao.org/ag/locusts/oldsite/LOCFAQ. htm?ftag=YHF4eb9d17

4. The World Bank Group and The Locust Crisis available at: https://www. worldbank.org/en/topic/the-world-bank-group-and-the-desert-locustoutbreak

5. Factsheet April 27, 2020, The Locust Crisis: The World Bank's Response, available at: https://www.worldbank.org/en/news/factsheet/2020/04/27/ the-locust-crisis-the-world-banks-response

6. Holger Kray, Shobha Shetty, The locust plague: Fighting a crisis within a crisis, April 14, 2020 Availableat: HTTPS://BLOGS. WORLDBANK.ORG/VOICES/LOCUST-PLAGUE
7. Daniel Uria, Historic swarm of locusts descends upon India, destroying crops, May 27, 2020 available at: https://www.upi.com/ Top_News/World-News/2020/05/27/Historic-swarm-of-locustsdescends-upon-India-destroying-crops/5971590625959
8. Ibid.
9. Kabir Agarwal And Shruti Jain, Climate Change Brings the Worst Locust Attack in Decades to India, May 27, 2020 available at: https:// science.thewire.in/environment/locust-attack-india-jaipur-climatechange

10. Extreme weather worsens the locust outbreak, says WMO, available at: https://www.iol.co.za/news/africa/extreme-weather-worsens-thelocust-outbreak-says-wmo-41769208
11. Frequently Asked Questions (FAQs),Desert Locus Information Service available at: http://www.fao.org/ag/locusts/oldsite/LOCFAQ. htm?ftag=YHF4eb9

12. Factsheet April 27, 2020, The Locust Crisis: The World Bank's Response, available at: https://www.worldbank.org/en/news/factsheet/2020/04/27/ the-locust-crisis-the-world-banks-response

13. Contingency Plan for Desert Locust Invasions, Outbreaks and Upsurges, Ministry of Agriculture & Farmers Welfare, Government of India available at: http://ppqs.gov.in/sites/default/files/contingency_plan_0. pdf

14. Pallavi Das & Vineet K Giri, How colonial India fought locust attacks, May 30, 2020, available at:

15. Jeffrey Gettleman and Suhasini Raj, 'Overtaken by Aliens': India Faces Another Plague as Locusts Swarm, New York Times, May 27, 2020 available at:

16. Contingency Plan for Desert Locust Invasions, Outbreaks and Upsurges, Ministry of Agriculture & Farmers Welfare, Government of India available at: http://ppqs.gov.in/sites/default/files/contingency_plan_0. pdf

17. Contingency Plan for Desert Locust Invasions, Outbreaks and Upsurges, Ministry of Agriculture & Farmers Welfare, Government of India available at: http://ppqs.gov.in/sites/default/files/contingency_plan_0. pdf

18. Aviation regulator warns airlines that swarms of locusts could pose serious risk while flying, May 29, 2020 available at: https://scroll.in/latest/963294/ aviation-regulator-warns-airlines-that-swarms-of-locusts-could-poseserious-risk-while-flying
19. India's 'worst' locust plague, and why it needs to be controlled before monsoonMay 28, 2020, available at:https://www.theweek.in/news/ india/2020/05/28/explainer-india-worst-locust-plague-and-why-itneeds-to-be-controlled-before-monsoon.html
20. Historic Rivals India and Pakistan Team Up To Fight Locusts, May 21, 2020 available at: https://science.thewire.in/environment/indiapakistan-locust-attacks/. Also see https://scroll.in/article/963177/ how-tensions-with-pakistan-hamper-indias-fight-against-worstlocust-attack-in-26-years. Also see http://strategicstudyindia.blogspot. com/2020/05/climate-change-brings-worst-locust.html
21. Kabir Agarwal And Shruti Jain, Climate Change Brings the Worst Locust Attack in Decades to India, May 27, 2020 available at: https:// science.thewire.in/environment/locust-attack-india-jaipur-climatechange/