

## Cyclone Fani: RSTV – In Depth

Anchor: Teena Jha

### Larger Background:

- South India and Odisha was put on alert recently for what had been developing into India's worst cyclonic storm since 2006.
- This was Cyclone Fani, that had been hovering off the east coast of southern India.
- Cyclone Fani is the first cyclone to be categorised “severe” by the Indian meteorological department since Cyclone Mala made landfall in Myanmar in 2006.
- The weather forecast on Monday morning was that over the next 24 hours, it could even turn into a “very severe” cyclonic storm.
- The IMD predicted heavy rain at isolated places in Kerala and on the west coast on April 29th and 30th, 2019.
- But it ruled out the possibility of the cyclone descending on Tamil Nadu and Andhra Pradesh.
- Odisha is on alert. The state government has directed officials to take precautionary measures.
- Prime Minister Modi is also in touch with officials on the progress of the cyclone.
- This edition of In Depth takes a close look at the threat of cyclone Fani, the phenomenon of cyclones itself, how they are formed and the destruction they can cause.

### Analysis:

Cyclone Fani is expected to intensify into a very severe cyclonic storm by 30th April, 2019 and will continue to move north-west and change its path to north-east from 1st of May, 2019.

- According to the Met department, landfall over Tamil Nadu and Andhra Pradesh is ruled out. However, the possibility of landfall in Odisha, is under continuous watch.
- Prime Minister Narendra Modi has directed officials to take preventive measures to deal with cyclone Fani.
- He has asked officials to be prepared to provide all possible assistance and urged them to work closely with the governments of the affected states.
- The government has put the NDRF and the Indian Coast Guard on high alert. According to the Monday bulletin of the cyclone division of the IMD, the storm is about 620 kilometers east of Trincomalee, in Sri Lanka, and 880 kilometers south-east of Chennai and 1050 kilometers south-east of Machilipatnam, Andhra Pradesh.
- The National Crisis Management Committee, the country's top body to deal with the emergency has assured all the state governments concerned of all assistance from the centre in facing the storm. The NDRF and the Indian Coast Guard have been put on high alert, and the fishermen have been asked not to venture into the sea in the wake of the approaching cyclone.
- The wind speed of a cyclonic storm is 80-90 kilometers per hour, with winds gusting upto 100 kilometers per hour. In case of an extremely severe cyclonic storm, wind speeds reach up to 170-180 kilometers per hour and could even touch 195 kilometers per hour.
- Light to moderate rainfall at few places is very likely over north coastal Andhra Pradesh and south coastal Odisha on the 2nd of May, 2019.
- The precipitation is likely to increase in intensity with heavy to very heavy rainfall at isolated places over coastal Odisha, and adjoining districts of north-coastal Andhra Pradesh from the 2nd of May, 2019.
- Light to moderate rainfall is expected at many places. The IMD has ruled out landfall over Tamil Nadu and Andhra Pradesh. However, the possibility of landfall in Odisha is under continuous watch.
- The IMD is issuing 3-hourly bulletins with latest forecasts to all states concerned. The Home

Ministry is also in continuous touch with the relevant State Governments, and Central agencies. The national crisis management committee also met in the national capital.

- Under the chairmanship of cabinet secretary P.K. Sinha and took stock of the situation. Chief Secretaries, Principal Secretaries, of Tamil Nadu, Andhra Pradesh, Odisha and West Bengal, attended the meeting through video conferencing.

### Let's now understand what a cyclone is

- The term cyclone refers to several different types of storms that are seen in different places. While some are seen over land, others take place over water.
- However, what they all have in common is that they are spinning weather systems that rotate around a low pressure center.
- The word cyclone is derived from the Greek words 'cyclos', that means 'coiling of a snake'. In meteorology, a cyclone is a large scale air mass that rotates around a strong center of low atmospheric pressure. It is caused by atmospheric disturbances around a low pressure area. A cyclone is usually accompanied by violent storms and severe weather conditions. Strong winds spiral around the center and pick up speeds of 62 kilometers per hour or more. These winds rotate counter-clockwise in the northern hemisphere and clockwise in the southern hemisphere. Tropical cyclones form all around the world. They are generally about 300 miles north or south of the equator. When they form in the Atlantic or the eastern Pacific, the storms are called Hurricanes. In the western north-Pacific they are called Typhoons. In the south Pacific and the Indian Ocean region, they are called cyclones.
- A cyclone is formed when the warm temperature of the sea reaches a threshold level and the wind structure is rising. In simple words, cyclones derive their energies from the warm tropical oceans and do not form unless the sea surface temperatures is above 26.5 degrees Celsius. However, once formed, they can persist at lower temperatures and dissipate over land or colder oceans. The originate over the sea and travel about 300-500 kilometers a day. A fully mature cyclone releases energy equivalent to a few hydrogen bombs. The diameter of a cyclone varies from 150-1000kilometers, but their effects dominate thousands of square kilometers of the ocean surface. The eye of the cyclone is the center of the cyclone, and the areas around the eye are the most affected due to strong winds.
- Cyclones are classified into 5 different categories, on the basis of wind speed from category I to category V. Wind speeds vary according to the category of the cyclone from 60 kilometers per hour to about 220 kilometers per hour and above. One the winds around the low pressure area reach to wind speeds of about 62 kilometers per hour, it is termed as a tropical cyclone and is assigned a name. As and when the wind speeds settles between 89 and 118 kilometers per hour, it turns into a severe cyclonic storm. The storm then intensifies into a very severe cyclonic storm when the wind blows at about 119- 221 kilometers per hour. When the wind speeds exceed 221 kilometers per hour, the cyclone is called a super cyclonic storm.
- The IMD scale uses 7 different classifications for systems within the north Indian ocean. Tropical cyclones are amongst the most destructive natural hazards in the world. They often produce widespread torrential rains in excess of 6 inches that may result in deadly and destructive floods. Due to intense rainfall, flash flooding can also occur. Heavy rainfall can also lead to mudslides and landslides in mountainous areas. The strong, gusty winds cause excessive damage and they uproot trees and damage buildings. Even after the cyclone passes, the trail of destruction continues. Stagnant water often causes the spread of diseases and hampers transportation and communication infrastructure. Tropical cyclones cause extensive damage to life and property across the globe every year.

Every year, there are reports of the large scale destruction caused by cyclones in India. The worst affected is the southern part of the country. In fact, all the states which are settled on the coastline, come under the grid

of cyclones. Let's take a look at some of the major cyclones in the recent past.

Life in coastal areas of India is never complete without the threat of cyclonic storms. Every year, there is news of storms battering the coastline. The worst affected are the southern states.

### **Case in Point: Andhra Pradesh**

- Between 1990 and 2014, Andhra Pradesh has witnessed 10 cyclonic storms. Some of the important ones are: Laila, Neelam, Helen, Lehar, Hudhud.
- In 2010, 65 people were killed due to cyclone Laila. While property worth 11 crore, 74 lakh dollars were damaged.
- In 2012, 75 people were killed due to cyclone Neelam. It damaged property worth 5 crores and 67 lakh dollars.
- In 2013, cyclone Helen killed 11 people. However, the loss was more than 80 crore dollars. Andhra Pradesh was very severely affected by the cyclone.
- In 2014, cyclone Hudhud killed 124 people. The destruction caused by it was 300 crore dollars. The neighbouring states and surrounding countries as well suffered because of this.

### **Case in Point: Kerala**

- In Kerala, the extremely severe cyclonic storm, BOB 06 hit the state in 2000. In this storm, 9 people lost their lives. Apart from India, a large part of Sri Lanka too was badly affected.
- 2016: Kerala was hit by cyclone Nada and brought heavy rain. However, in this storm, there was not much loss to life and property.
- 2017: In December 2017, the cyclone Ockhi caused a major catastrophe in Kerala.

### **Case in Point: Maharashtra**

- Cyclone ARB 04 in Maharashtra brought large scale destruction. It witnessed a loss of 1 crore, 25 lakh dollars.
- 2009: Years later when Cyclone Phyan hit Maharashtra in 2009, it once again spelt disaster for the state. This storm killed 20 people and the damage caused was estimated to be more than 30 crore dollars. This loss is a cumulative loss of that which was incurred by Sri Lanka, India and Pakistan.

### **Case in Point: Odisha**

- 1999: In the year, 1999, cyclone BOB 06 brought about huge destruction in the eastern coast. This storm is also called Paradip cyclone, with a speed of 160 miles per hour, this cyclone devastated Odisha and Myanmar.
- More than 10,000 people were killed in this cyclone.
- Properties worth 400 crore dollars were damaged.
- Till date, this has been the most devastating cyclone of the North Indian Ocean.
- In the year, 2013, Odisha had to undergo a massive catastrophe once again- this time, cyclone Phailin caused huge damage to Odisha. It also impacted the neighbouring countries such as Thailand and Myanmar. 45 people were killed in this cyclone, while 69 crores, 60 lakh dollars worth property was lost.

### **Case in Point: Tamil Nadu**

- 11 minor and major cyclones made landfall in Tamil Nadu from 2005-2018.
- The Fanoos cyclone in 2005 killed 273 people, mostly from Tamil Nadu. It also caused a loss of 2 Crore, 14 lakh dollars.
- In 2008, Cyclone Nisha took the lives of 200 people, and there was a loss of 80 crore dollars.

- In 2010, Cyclone Jal made landfall in Tamil Nadu and killed 118 people. 12 people went missing. This storm damaged property worth 173 crore dollars.
- In 2011, Cyclone Thane killed 48 people. Damage estimated was 23 crore, 50 lakh dollars. This storm affected the southern part of India and Sri Lanka.
- In 2012, Cyclone Neelam killed 75 people and 5 Crore, 67 lakh dollars was the property worth that was damaged.
- Cyclone Vardah in the year 2016, and Cyclone Ockhi in 2017, also wreaked havoc in Tamil Nadu.

Climatic disasters in India cause massive loss of life as well as property. They might be in the form of Tsunami's, hurricanes, and even dust storms.

### **A Look at different types of storms:**

Nature has always proved to be more powerful than humans. Despite developments in weather forecasting techniques, and technological advancements, disasters at many times cannot be prevented. Time and again, we have seen and read about many natural disasters occurring in the country and outside, such as storms, tornadoes, hail, thunderstorms, etc, causing great havoc in the process.

These storms have the potential to harm lives and property through a storm surge, heavy rain, or snow causing flooding, lightning and vertical wind.

### **However, how does a storm occur?**

- Storms are a natural phenomenon caused by violent atmospheric disturbances, over land and water.
  - Storms are created when a center of low pressure develops with the system, of high pressure surrounding it.
  - They are classified by how strong the winds are, or by how heavy the rainfall, lightning or snow are.
  - Storms that form north of the equator, spin counter-clockwise. Storms south of the equator spin clockwise.
  - This difference is because of the earth's rotation on its axis. As the storm system rotates faster, an eye forms in the center.
  - There are several different types of storms, distinguished by the strength and characterization of atmospheric disturbances.
1. Tropical Storm: When the winds reach 39 miles per hour, the storm is called a tropical storm.
  2. When the wind speed reaches 74 miles per hours, the storm is officially a tropical cyclone.
  3. Extra tropical cyclones are called as winter storms and blizzards.
  4. Monsoon type storms are tornadoes and thunderstorms.
  5. Certain violent winds, affecting limited areas are also called storms.
- Cyclones usually develop in the tropical region, i.e. to the south of the tropic of cancer in the northern hemisphere. Whereas, the western disturbances, develop to the north of the tropic of cancer, and they move across in that latitude. However, sometimes, when they become more intense in the Indian region, they can extend to the southern latitude even upto 15 degree north.
  - The weakest tropical cyclones are called tropical depressions. If a depression intensifies such that its maximum sustained winds, reach 39 miles per hour, then the tropical cyclone becomes a tropical storm.
  - Once a tropical cyclone reaches maximum sustained winds of 74 miles per hour, or higher, it is then classified as a hurricane/typhoon, depending on where the storm originates in the world. Tropical cyclones are revolving storms that begin in the tropics.
  - Storms of this type are called hurricanes, and in the north Atlantic and in the eastern pacific. They are called typhoons in south-east Asia and China.
  - They are called tropical cyclones in the south-west pacific and Indian ocean region. Tropical

cyclones form near the equator and gain their energy from the heat that is released when the water vapour condenses into rain.

- The warm, moist air over the ocean rises upward from near the surface. Because this air moves up and away from the surface, there is less air left near the surface. They are about 500 kilometers across and may have a central region with relatively little cloud and light winds- this region is called the eye.
- Hurricanes are the most violent storms on earth. In the Atlantic, the hurricane season runs officially from June 1st to November 30th. 97% tropical cyclone activity occurs during this time period. However, there is nothing magical about these dates. Hurricanes do and can occur outside this 6-month period as well.

