CYCLONE: THE NATURAL CATASTROPHE

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ABSTRACT–

Cyclone is one of the most dangerous natural disaster in which a huge revolving or spinning storm accompanied by high speed howling winds and torrential rains they are tropical storms caused by winds rotating around the eye or central area of low atmospheric pressure cyclones can form over warm water in tropical region of the ocean where the sea temperature are 26.5 degree Celsius or higher cyclones occur in area of very low pressure where the air is heated by sum rises rapidly and becomes saturated with moisture which them condenses into high thunder clouds as the hot air rises cooler air rushes in to the fill the area left vacant by the air. The Coriolis Effect of the Earth spinning on its own axis causes the air to spiral up wars it considerable force this in turn causes the wind to rotate faster causing the tropical low to deepen in intensity into a tropical depression and eventually a cyclone. The tropical cyclone initiates from a collection of cumulonimbus clouds before the intense vortex dominates the dynamics. However, the convective clouds in the genesis stage exhibit differences from ordinary cumulonimbus, including very intense "convective bursts" and rotating convective cells called "vertical hot towers". This topic discuss about the critical situations of all living things which is created by nature which can destroy everything within minutes and learn about how to deal with this situation which is named as "CYCLONE".

Keyword – Cyclone, Howling winds, torrential rains, tropical rains, tropical depression, vulnerable.

INTRODUCTION-

A cyclone is a general term for a weather system in which winds rotate inwardly to an area of low atmosphere pressure. It is huge disk of clouds. They are between 10 15 km thick. They are made of bands of storm clouds rolled into a spiral around a zone of very low pressure called as the eye of the cyclone. Acyclone describe a weather system characterized by swirling winds around a low pressure center; wind direction around the low is clockwise in the Northern Hemisphere, clockwise in the Southern Hemisphere. Coming in a wide variety of sizes and settings, cyclones cause some of the most dramatic and outright violent weather on the Planet including the tropical cyclones known as hurricanes and typhoons. The science behind cyclones will help you to understand that why, where and how this weather phenomenon exists.

Cyclone is divided into two types:

(I)Tropical Cyclone (II) Middle Latitude Cyclone (Mid-latitude)

(I)Tropical Cyclone: The National Weather Service defines a tropical cyclone as "a rotating system of clouds and thunderstorms that originated over tropical or sub-tropical areas." The major tropical cyclone basins include the North Atlantic (including the Caribbean), Eastern Pacific& North Indian Ocean, and southwest Indian Ocean, southern pacific and Australian religion. Typically tropical cyclones develop within 5 and 30 degree latitude. As they require ocean waters of 80 degree Fahrenheit or so to form. Winds funnel into a low-pressure disturbance, evaporating warm surfacewater and releasing energy as rising air condenses into clouds.

The terminology associated with tropical cyclones can be confusing, because people call these dangerous storms by different names in different parts of world. In the North Atlantic &Caribbean as well as North-Eastern Pacific, they go by "hurricane" while in the Indian Ocean and South Pacific they are simply "tropical Cyclone" or "Cyclone". Tornadoes much smaller and more localized than tropical cyclone. And capable of generating even higher wind speed are occasionally colloquially called "Cyclones" through they're completely different storms. Cyclone have been responsible for about 1.9 Million deaths worldwide over the lost two centuries and it is estimated that 10,000 people are killed each year by these storms. In 2019 the countries most affected by tropical cyclones in the ocean are the islands

of Madagascar, Mauritius and La Reunion. Also affected is Mozambique which has a coastline and Zimbabwe which is landlocked according to meteorologist Typhoon tip is known in the Philippines as Typhoon Warning was the Largest and most intense tropical cyclone ever recorded.

(II) Middle Latitude Cyclone (Mid-latitude): It can be define as the mid-latitude cyclone is a synoptic scale low pressure system that has cyclonic (counter-clockwise in Northern hemisphere) flow that is found in the middle latitude. Mid-latitude cyclone are main cause of wind storms in the Middle Latitude.

Methodology-

Cyclone are named alphabetically formerly they were given female name but know they are given either male or female names although it is common to give a cyclone are known as "Hurricanes" in the Atlantic ocean and in the Caribbean typhoons in Asia the pacific Cyclone in the sub-continent India and tornadoes when they are land based.

Global warming and climate change have increased the possibilities of cyclone to occur more often at a large scale. In the addition to this El Nino and La Nina events have changed the currents and sea temperature which also increase the number of cyclones.

According to Meteorologist many of the coastal states especially in India the cyclone prone the East coast of India is more frequently affected by cyclone as compared to the West coast the cyclone prone states are Gujarat, Kerala, Goa, Tamil Nadu, Andhra Pradesh, West Bengal Daman, Diu Orissa.

In India there are two prevailing cyclonic cycles or seasons which are:

(1) The South-West Indian Ocean Cycle Season (SWIOCS)
(2) The North Indian Ocean Cycle Season (NIOCS)

The South-West Indian Ocean Cycle Season (SWIOCS) starts July and ends the next year in June. Cyclones in the Northern Hemisphere generally rotate anti-clockwise and cyclones in the southern hemisphere rotate clockwise.

The North Indian Ocean Cycle Season (NIOCS) will be an event in annual cycle of tropical cyclone formation the (NIOCS) has no official bounds but cyclones tend to form between April, December, and peak in May-November.

The road would stagnate there would be power block out in the aftermath electric wires were some area was suffer from bad condition like disease (water-borne disease) like, Cholera, Typhoid, Malaria, would become rampant manytrees are uprooted sometimes we were given holdings because of deluge many villages would flood due to incessant run the damaging winds flying debris causes damage to trees habitat and can effect sewage and sanitation system. Due to cyclone the sea level rises up to 10-20 feet or more. The surge water which comes ashore with the storm causes incredible damage when cyclone cause the landfall with cyclone wind causes soil erosion as well as defoliation of forest. Cyclone cause flooding which effect on domestic or wild animals E.g.-cattle, Deer, etc. And tidal surge where Boars, Lingers which is drowned nearly 95% of the rice crops adversely affected on the farmers. Cyclone cause effect on all air crafts and industrial ships with accident disease.

When flood generated by cyclone runs all 20-30 cm per day are more destructive than winds. In India there are some special system which use for cyclone warning center. These center are available in six state which is, Kolkata, Bhubaneswar, Vishakhapatnam, Chennai, Mumbai, Ahmedabad, each center has distinct responsibility covering both coast which is East and West coast of India the oceanic areas of the Bay of Bengal. The Arabian Sea and the Andaman Nicobar and Lakshadweep Islands. Warning are issued through AIR (All India Radio) and Doordarshan and telecasted in different languages on hourly interval areas threaten by cyclone heavy rainfall magnitude of destructive winds and probable inundation of coastal area by storms surge are included in the bulletins landfall the line at which a storm passes over the share scorn moving land after over water. "A storm surge is an oceanic event responding to meteorological driving forces potentially disastrous surges occur along coast with low lying terrain that allows inland water bodies like estuaries bays, lakes and rivers for

riverine situations the surge is sea water flowing moves down a river due to rain this is the after effects of the storm a surge effects 100kms of coastline for a period of as done.

The cyclone warning system is broken down into four stages in which the

1st stage: The Pre-cyclone watch is main land regularly during cyclone seems are provide an early warning if condition mature for a cyclones disturbance to take birth in the sea.

2nd stage: In the second stage cyclone alert 48hrs prior to the anticipated time of commencement of adverse weather along the coast.

3rd stage: Cyclone warn before 24 hours cyclone is anticipated the landfall is updated frequently the warnings to ports spawning farms and fisheries are done earlier.

4th stage: These stage is post landfall scenario which commences 12hrs before anticipated landfall and continuous so long as cyclones forces winds 60 Kmph are effecting area over land.

In this paper the probability distribution functions of cyclone key parameters obtained from the land falling track records especially of Indian region. The speed of cyclonic wind having particular site in coastal region which is obtained and compared by using probability distribution from actual track records.

The cyclone key parameter is defined as the parameter which can uniquely determine a wind field. These key parameters are

(1)Central Pressure Difference (ΔP)

(2)The radius of maximum wind speed, Rmax

(3)The translation velocity of cyclonic track VT

(4) Track angle with site (α).

(1) Central Pressure Difference (ΔP):

It is the difference between storm central pressure (P0) and pressure at the storm periphery (Pe) of a cyclone. The pressure at the storm periphery of a cyclone denoted as (ΔP)

The central pressure difference is used for determining the wind speed

It is shown as,

$V_m=14.2\sqrt{(Pe-Po)}$

Where,

Pe is the peripheral Pressure and

P0is the pressure at the center of the storm

The Central Pressure difference can be calculated by using this relation which is,

ΔP = 1013.25-P0

(2) Radius of the Maximum Wind Speed (Rmax):

The radius of maximum wind speed is denoted by Rmax is radial distance between the vortex and region of maximum wind speeds. The radius of maximum wind for different wind speeds in the Bay of Bengal has been taken from world Meteorological Organization (WMO).

(3)Translation Velocity

VTdenotes the translation velocity of cyclonic track. Distance between two points of storm track by travel time can be calculated by using Haversine Formula as given below.

Δlat = lat2 - lat1

Δlong= long2-long1

$a= \sin^2(\Delta lat/2) +\cos(lat_1).\cos(lat_2).\sin(\Delta long/2)$

$c= 2a \tan^2(\sqrt{a}, \sqrt{1-a})$

d=RC

Where lat1&lat2are the latitudes of the point 1&2 respectively, long2&long1are the longitude of point of 1&2 respectively,the two argument functionatan2 is a variation of the arc tangent function R is the radius of Earth (mean radius=6.371km)& d is the distance between 1&2.

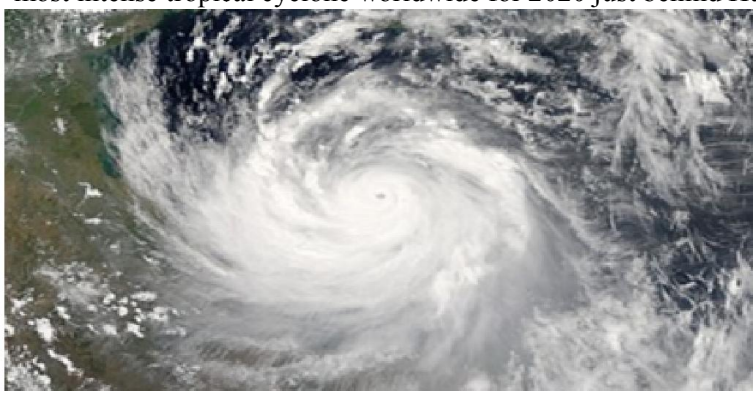
(4) Track Angle withSite (α):

Track angle with North is calculated as per the procedure followed in the heading direction. The track angle with site is determined by using heading direction & track angle with

North.The tropical cyclone is most frequent and devasting India is no stranger to cyclones being a tropical country it has been battered by cyclones to every year some of the worst cyclones to ever hit the sub-content area the last few states in India between2019-2020 are

(1) Cyclone Amphan:

Cyclone Amphan was a powerful tropical cyclone which led to destruction of lives and property in the state of Odisha & West Bengal. Cyclone Amphan was the first pre-monsoon super cyclone of this century and emerged from the Bay of Bengal. It is tied with Harold and Haishen for 3rd most intense tropical cyclone worldwide for 2020 just behind Hurricane lota



Cyclone Amphan

The cyclone Amphan was formed in16th May 2020 and it was dissipated in 21st May 2020. Because of cyclone Amphan most of the areas are affected in which West-Bengal, Odisha, and Andaman and in other country Bangladesh, Sri Lanka, and Bhutan. Cyclone Amphan is the first tropical cyclone in 2020 during COVID pandemic situation which is in North Indian Ocean Cyclone Season, Amphan is originated from a low pressure area persisting East of Colombo, Srilanka on 13th May 2020.On 20th May 2020 between 10.00 and 11.00 UTC. Cyclone made landfall in West Bengal.

(2) Cyclone Nisarga

Cyclone Nisarga is the 2nd pre-monsoon cyclone that has emerged from the Arabian-Sea and is expected to hit Goa, Maharashtra& Gujarat. Cyclone Nisarga has hit Alibag in Mumbai and is expected to weaken in 6 hours.

Cyclone Nisarga

Cyclone Nisarga was formed in 1st June 2020 and dissipated in 4th June 2020. Cyclone Nisarga damage 12,440 Acers and it caused 6 deaths and 16 injuries.

(3) Cyclone Kyarr:

Super cyclonic storm Kyarr was an extremely powerful tropical cyclone that become first super cyclonic storm. The storm underwent rapid intensification and reached super cyclonic storm status on October 27 as it turns westward. The kyarr cyclone was formed in 24thOctober 2019 and it take peak intensity in 27th October 2019 and it dissipated in 3 November 2019. Cyclone kyarr was affected in Western India, Oman, United Arab

Estimated, and Socotra, Somalia. In Gujarat more than 157, 00 farmers filled insurance claim due to damage related to Kyarr with huge loss of Groundnut, Cotton. High tides from Kyarr flooded towns on

TheOman. In neighboring United Arab Emirate. High tides flooded streets, houses &schools in eastern coastal area of Sharjah and Fujairah

(4). Cyclone Bulbul:

Cyclone Bulbul was severe tropical cyclone that hit West Bengal in 2019 as well as in Bangladesh in November 2019, causing storm, surge, heavy rain and flash floods across the areas. These cyclone was formed in 5 November 2019 and dissipated in 11 November 2019.

Cyclone Bulbul

The cyclone caused severe damage across coastal Bangladesh resulting damage of 25 people in Khulna district 9,455 peoples were homeless.

Conclusion:

Cyclone is one of the dangerous disaster which can be change climate situation especially in coastal areas. The tropical cyclone effect on all living and non-living thing like human, animal, plants etc. The tropical cyclone when hit the surface which cause damage ships and vessels. The effectof a cyclone is terrible, as it destroy everything as its wake. At that situation people are homeless and helpless. It has always been fared by human even though precautions are taken to save one the damages cannot be prevented. Cyclone are natural calamities that strike as violent storms & grievous weather conditions caused by disturbance in the atmosphere they lead to great devastations.

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