

TROPICAL CYCLONES

During the past 127 year period (1881- 2008), only sixteen cyclones (Five are severe cyclonic storms) crossed the coasts of Sri Lanka. There are five other cases which are still doubtful whether they were cyclones or depressions. Cyclones are born as small vortices.

Classification of tropical revolving systems in Sri Lanka are,

| <u>Weather System</u> | <u>Maximum Wind Speed</u> |
|-------------------------------|---|
| 1. Low pressure area | Wind speed less than 17 kt (31 km/h) |
| 2. Depression | Wind speed between 17 and 33 kt (31 and 61 km/h) |
| 3. Cyclonic storm | Wind speed between 34 and 47 kt (62 and 88 km/h) |
| 4. Severe cyclonic storm | Wind speed between 48 and 63 kt (89 and 118 km/h) |
| 6. Very severe cyclonic storm | Wind speed 64 and 119 kt (119 and 221 km/h) |
| 7. Super cyclonic storm | Wind speed 120 kt and above (222 km/h) |

Most of these cyclones have crossed Sri Lankan East coast (fig 1) during the period from November to December (fig 2). As such the months of November and December are considered as cyclone prone months.

Well developed cyclone consists of a centre, named as “Eye”, revolving system around it, called as “Eye Wall” and some spiral bands called as “Feeder Bands” (Fig 3).

Characteristics and associated weather of these three parts are as Follows.

- (a) The ‘EYE’. The circular eye or centre of tropical cyclones is characterized by light winds and often-clear skies. The eye diameter may range from 20 km to 100 km.
- (b) Eye wall is a belt of strongest winds and heaviest rainfall. The eye wall may have a width of 35 to 100 km around the central calm region. Maximum wind speeds which may exceed 200 kmph in gusts are observed in this region. Rainfall up to 50 cm per day may be expected within the wall cloud.

(c) Spiral bands also known as 'feeder bands' in which rain activity and strong squally weather is most pronounced are also dangerous in the point of view of hazards. They may be located as far as 500 km or more from the centre, gradually spiraling up to the eye wall.

Severe Cyclonic storm, which crossed Sri Lanka (17-24 November 1978) reporting maximum wind speed (At Batticalloa) of Northerly 145 km/hr while satellite estimated maximum wind of 222 km/hr with surge height of 2.7 m at Batticalloa, claiming 915 lives. Being a small island there is no place to evacuate under cyclonic situation.

On 21st of November 2008, low pressure area developed in the vicinity of the island and moved over eastern parts of the island causing heavy rain in the East on 22nd and 23rd. System intensified in to a depression and located over Jaffna peninsula on the 24th. It was practically stationary but intensified in to a tropical cyclone on the 25th locating just off the north coast. Extremely heavy rain and strong winds occurred over Jaffna peninsula on the 25th night causing floods and several damages. The highest daily rainfalls were 197.5 mm and 389.8 at Jaffna on 24th and 25th respectively.

During the first week of December 2008 low pressure area was developing to the South east of Sri Lanka. International media announced that cyclone was heading to Sri-lanka and public was in a severe panic. Though the system developed in to a cyclone, weakened to a depression when came closer to the island. According to the above cases cyclone threat is possible every year though the crossing the country is rare.

Life cycle of a cyclone is very similar to human's life cycle. We born as a baby and grow as a kid, teenager, youth, adult etc. Decaying starts after and sudden deaths are also possible. Cyclones are borne as disturbances and intensify gradually as low, depression, cyclone, severe cyclone, very severe cyclone and super cyclone as mentioned earlier. As such sudden occurrence of cyclone (like Tsunami) is impossible. Department of

Meteorology has enough time and trained scientists to issue relevant forecast and warnings according to the regulations of World Meteorological Organization.

Recent Improvements of the forecasting system:

Accurate determination of TC landfall, location and timing are the keys to the effectiveness of TC warnings/forecasts for a specific region. Synoptic situation, cloud imageries and very few advisories received through GTS (Global telecommunication Network) were used by the Department of Meteorology Sri Lanka. Meteorological Observation Network has been improved very recently with 38 Automatic weather Stations. With the availability of internet, there is an opportunity to use number of model out puts and forecasts prepared by various relevant organizations and more frequent satellite imageries. The challenge is to use this information accordingly. Satellite receiving systems Fun Yung Cast (China) and COMS (Korea), DMDD (India), Doppler radar procured in near future will help to improve the forecasting capabilities. Integrated Forecasting System should be introduced for user friendly process of available data.

Storm surge and wave height forecasting was a significant problem in Sri Lanka. India donated storm surge model with proper training to the Department of Meteorology.

Communication problems arise during most bad weather situations. This seriously affected the both information receiving and warning dissemination. Recently acquired satellite communication system will help to continue good communication even during any disaster situation. Signal levels and colour code system was introduced in 2008 (Table 1) for easy and quick under standing of the cyclone warning. In addition to the media Tsunami Warning Towers will disseminate the warnings to last mile posts.

The project consists of two stages (Hazard Mapping and Risk Mapping) to cover the risk assessment due to Tropical Cyclones within two years time will be launched recently. The relevance and availability of best cyclone track data will be considered for the analysis of the above project. Intensity T number from 3 to 7 , path of the cyclone

Westward, North-west wards, Northwards , Size of the core (0-100), 150, 200, 250 km, position of the landfall simplifying to 4 district, seasonality will be the scenarios.

The pre-pilot phase of the Forecast Demonstration Project (FDP) on land falling cyclones over the Bay of Bengal is being taken up by Indian scientists for in-depth study of core structure of cyclone and its utility in NWP modeling for track and intensity prediction. Cooperation of Department of Meteorology, for the success of FDP is already requested to take necessary arrangements for real time exchange of data the out put of the project will certainly help us to improve the cyclone forecasting.

**For any queries regarding weather related disasters and Tsunami, please contact
Department of Meteorology Head office: 011-2694846, 7, 8, 2684746, 2686686**

Airport Branch: 011-2252721, 2263924, 25, 26

**Dialog subscribers can hear the recorded weather forecast and warnings, dialing
“555”.**

| Cyclonic Disturbance | | | |
|----------------------|--------|---|---|
| Signal No | Colour | Description | Action Required |
| 1 | White | Potential area of development of vortex | Information only, vessels at sea to be vigilant |
| 2 | White | Cyclone has formed | Information only, vessels to avoid the area, listen to media |
| 3 | Orange | Weather experienced in coastal region, sea getting rough | Vessels to avoid area, people to stay away from sea/beach |
| 4 | Orange | Raining and windy (~ 40 knot), sea rough | Stay away from beach, vessels in danger, be inside building |
| 5 | Orange | Heavy rain with very strong winds (> 40 knots) | Be ready to leave buildings with weak structures (in relevant areas only) and low line (flood prone) areas, secure your home/valuables. |
| 6 | Red | Heavy rain with very strong winds > 40 knots, cyclone expected to cross land | Evacuate to pre designated safe places. |
| 7 | Red | Severe weather with very strong winds (> 50 knots), severe cyclone expected to cross land | Evacuate to pre designated safe places. |
| 0 | Green | Cyclone Warning Cancellation/Withdrawal Bulletin ALL CLEAR | |

Table 1

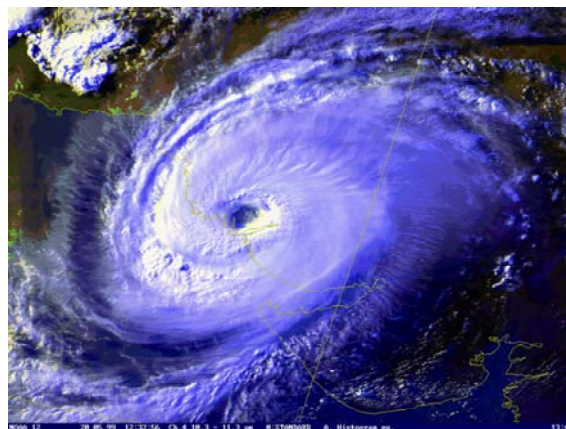


Fig 3

Department of Meteorology

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