

Standard operating procedure for civil defence response to disaster – cyclone

1. The mandate

Under the 2010 amendment to the Civil Defence Act, 1968, “civil defence” includes “... any measure taken for the purpose of disaster management, before, during, at, or after any disaster ...” Under section 2 (d) of the Disaster Management Act, 2005, ““disaster” means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area.”

Under section 2 (e) of the Disaster Management Act, 2005, ““disaster management” means a continuous and integrated process of planning, organising, coordinating and implementing measures which are necessary or expedient for—

- (i) prevention of danger or threat of any disaster;
- (ii) mitigation or reduction of risk of any disaster or its severity or consequences;
- (iii) capacity-building;
- (iv) preparedness to deal with any disaster;
- (v) prompt response to any threatening disaster situation or disaster;
- (vi) assessing the severity or magnitude of effects of any disaster;
- (vii) evacuation, rescue and relief;
- (viii) rehabilitation and reconstruction.”

In the case of cyclones, Civil Defence Organisation, West Bengal and its different wings are expected to contribute towards the state government efforts regarding sub paras (ii) – (v) and (vii) of the previous paragraph.

2. Cyclone

According to Glossary of Meteorology, American Meteorological Society, a “cyclone” is a large scale air mass that rotates around a strong centre of low atmospheric pressure. A tropical cyclone is a storm system characterized by a low-pressure centre and numerous thunderstorms that produce strong winds and flooding rain. A tropical cyclone

feeds on heat released when moist air rises, resulting in condensation of water vapour contained in the moist air. They are fuelled by a different heat mechanism than other cyclonic windstorms. The wind rotation is counterclockwise in the Northern Hemisphere. While tropical cyclones can produce extremely powerful winds and torrential rain, they are also able to produce high waves and a damaging storm surge. Their winds increase the wave size, and in so doing they draw more heat and moisture into their system, thereby increasing their strength. They develop over large bodies of warm water and hence lose their strength if they move over land. Coastal regions can receive significant damage from a tropical cyclone, while inland regions are relatively safe from strong winds. Heavy rains, however, can produce significant flooding inland. Storm surges are rises in sea level caused by the reduced pressure of the core that in effect "sucks" the water upward and from winds that in effect "pile" the water up. Storm surges can produce extensive coastal flooding up to 40 kilometres from the coastline.

Indian Meteorological Department (IMD) has characterised different cyclonic activity as below:

Category	Maximum sustained surface wind speed
Depression	31 – 49 kmph
Deep depression	50 – 61 kmph
Cyclonic storm	62 – 88 kmph
Severe cyclonic storm	89 – 117 kmph
Very severe cyclonic storm	118 – 166 kmph
Extremely severe cyclonic storm	167 – 221 kmph
Super cyclonic storm	= or > 222 kmph

IMD issues cyclone warnings in four stages. The first stage warning known as "PRE CYCLONE WATCH" issued 72 hours in advance contains early warning about the development of a cyclonic disturbance in the north Indian Ocean, its likely intensification into a tropical cyclone and the coastal belt likely to experience adverse weather. The second stage warning known as "CYCLONE ALERT" is issued at least 48 hrs. in advance of the expected commencement of adverse weather over the coastal areas. It contains information on the location and intensity of the storm, likely direction of its movement, intensification, coastal districts likely to experience adverse weather and advice to fishermen, general public, media and disaster managers. The third stage warning known as "CYCLONE WARNING" is issued at least 24 hours in advance of the expected commencement of adverse weather over the coastal areas. Landfall point is forecast at this stage. These warnings are issued at 3 hourly interval giving the latest position of cyclone and its intensity, likely point and time of landfall, associated heavy rainfall, strong wind and storm surge alongwith their impact and advice to general public, media, fishermen and disaster managers. The fourth stage of warning known as "POST LANDFALL OUTLOOK" is issued at least 12 hours in advance of expected

time of landfall. It gives likely direction of movement of the cyclone after its landfall and adverse weather likely to be experienced in the interior areas.

Different colour codes as mentioned below are being used for the different stages of the cyclone warning bulletins as desired by the National Disaster Management.

Stage of warning	Colour code
Cyclone alert	Yellow
Cyclone warning	Orange
Post landfall outlook	Red

3. Cyclone prone and vulnerable areas of West Bengal

While almost all districts of West Bengal may be affected by cyclone, the risk and vulnerability are greater, the closer the areas are to the coast. Following are the vulnerable areas of West Bengal. Some of them have been affected by recent major cyclones.

Vulnerable district	Affected by	
	Fani 2019	Aila 2009
E Medinipur	_/_	_/_
W Medinipur	_/_	
Jhargram	_/_	
Howrah		_/_
Hoogly		_/_
Burdwan		_/_
South 24 Parganas	_/_	_/_
North 24 Parganas		
Nadia		
Darjeeling		_/_ (Due to heavy rains and flooding)
Kolkata	_/_	_/_

4. Action before a cyclone

Cyclones cannot be prevented. However, the better the awareness of and planning for it, the less is the loss of lives and property and disruption of normal life and faster is the recovery. Enhancing disaster preparedness for effective response is one of the specific priorities for action as laid down in the Sendai Framework for Disaster Risk Reduction (2015 – 2030). Towards this end, the following actions are indicated for Civil Defence:

- (i) Thorough training of the staff and the volunteers of the cyclone prone vulnerable areas in cyclone awareness and preparedness in cyclone disaster mitigation.
- (ii) Preparing and maintaining a digitalised list of active volunteers and their contact details. Sufficient volunteers should be trained in handling of modern rescue equipment.
- (iii) Holding of cyclone awareness camps in the cyclone prone and vulnerable areas and educating the general public about action to be taken in the event of a cyclone alert or cyclone warning. Use of cartoons and drawings will help better absorption and engagement by the audience. Evacuation games may be organised in schools.
- (iv) Distribution of “My Disaster Evacuation Card” and chart to the public about the nearest cyclone/ storm centre and best/ alternate route of reaching the same.
- (v) Having the rescue centre and the Civil Defence Rescue Vehicles in operational readiness at all times.
- (vi) Monthly inspection of rescue equipment and their prompt repair and replacement, if needed.
- (vii) Preparation of list of nodal officers of other agencies like Disaster Management, Police, Medical service, district authorities, fishermen association, ambulance services, etc..
- (viii) Designation of an assembly point and an alternate assembly point of the nodal officers in the event of a disaster.
- (ix) Mock drills for cyclones should be arranged in coordination with all the concerned agencies in the cyclone prone and vulnerable areas at least once a year. The observers’ check list is as per Annexure 1.
- (x) Reinforcements of officers, staff, Agramis, boats, OBMs and equipment are likely. Their accommodation, catering and operations need to be planned for.
- (xi) The normal communication systems like cell phones may come under severe stress. Alternative communication system like wireless, satellite phones, etc. should be kept in readiness and in charged condition. Power sources may be disrupted. Inverters, generators and power banks should be catered for. In case the disaster recovery is prolonged, a “battle rhythm”, i.e., fixed times for meeting of the key rescue officials at a designated point should be fixed in advance. If possible, during mock exercise, the electricity and telephone network may be switched off or avoided so that the participants drill on how to operate without the regular phones.
- (xii) So far, the Civil Defence efforts have been directed towards rescue, relief and rehabilitation of humans. Civil Defence volunteers should also be trained in preliminary treatment and handling of affected animals.
- (xiii) Videos of Discovery channel pertaining to cyclone response may be shown to vulnerable population with subtitles in the local language.

5. Action during a cyclone (starting with Code Orange, Cyclone warning)

- (i) Move the men, material and equipment to be in readiness in areas of need. The available resources in the vulnerable districts and the desirable resources at

vulnerable points are given in Annexure 2. The shortfall should be moved from HQ and other districts as soon as the warning is received.

- (ii) Immediately establish a communication system for the rescue workers and with the district and disaster management authorities, Police, etc.
- (iii) Track the movement of the cyclone through “windy” or other apps and monitor the electronic media and IMD bulletins.
- (iv) Help the authorities in evacuation of vulnerable population.
- (v) Sagar sathis should keep a sharp watch along the coast to see that unaware persons do not go to danger areas and the sea.
- (vi) Make extensive use of loudhailers.

6. Action at the cyclone site

- (i) During high wind speeds of the cyclone, movement of Civil Defence teams is not possible or desirable. The activity should revolve around monitoring, warning, siren and loud hailer.
- (ii) Action should be taken to see that the communication system is operational and continuous.
- (iii) The nodal officers on the ground of each of the agency involved should be in constant touch with each other and update each other, the respective control rooms and their higher authorities for updating on the situation.

7. Action after cyclone

- (i) The immediate aftermath of the cyclone calls for maximum effort and presence of mind of the Civil Defence deployment. The aim should be to restore the transport and communication network as quickly as possible so that rescue and relief efforts can reach the affected people and places.
- (ii) The roads will be clogged with broken trees and debris. These should be cleared expeditiously.
- (iii) Broken buildings should be inspected to rescue trapped people and animals and these should be transported to the relief camp as soon as possible.
- (iv) The injured persons should be triaged as per the following protocol:

Triage Protocol/System

Red: High priority for treatment & transfer

Yellow: Medium Priority

Green: Ambulatory patients

Black: Dead or Moribund patients

Triage should be done only by a trained Medical Officer or paramedic of the Casualty service or Health department/ medical unit.

- (v) For each Civil Defence team operating at any site, the chain of command should be clearly defined, preferably by the SOI/ Sr SOI.
- (vi) The Civil Defence staff operating at the site are not authorised to speak to the media. Any media query should be referred to the authority designated for media briefing by the district authorities or higher formations.
- (vii) Normally, Civil Defence is not expected to be part of rehabilitation efforts. However, if the occasion arises and, under permission of HQ, the Civil Defence teams may be engaged in the same as a supporting hand.
- (viii) The stand down will be arranged by the district authorities. However, Civil Defence HQ retains primacy over stand down and release of Civil Defence teams and their redeployment elsewhere.

[Some pictures of Cyclone 'Fani.' May 2019]



8. Authorities and contact persons as on 2.6.2019:

Sl	Organisation	Designation	Name (Smt/ Shri/ Dr)	Phone no. Email id
1	Disaster Mangement	Principal Secretary	D. Nariala	033-22143674
		EOCC		1070 033-22143526 033-22145664 033-22535185
		Jt Secretary	S.S. Bhattacharya	033-22501004
		Director		033-22275820
2	Civil Defence	Director	B.B. Dash	033-22252179
		Nodal Officer	P.J. Ray	
		CR		033-22374033 033-22363594
3	IMD, Kolkata			033-24793167 033-24790596
4	State Disaster Response Force	ADG (Ops)		033-22145486 033-22144031 033-22145009
		WBP CR		033-22144031

				033-22145486
5	Kolkata Police	DCP, Combat	N. Singh	033-24794025
	Kolkata Municipal Corporation	Control Room		033-22861212 033-22861313 033-22861414
6	NDRF	2 nd Bn, Haringhata		033-25875032
7	Health & Family Welfare Department			033-23576000 033-23330100
8	Fisheries Department	Secretary		033-23570077
9	Indian Army	Col. GS Bengal Area		033-22232953 033-22133351
10	Indian Air Force	Adv HQ EAC	033-22482152	
11	Fire Services	DG		033-22527172
		Control Room		033-22521165
12	All India Radio, Kolkata			033-22485336
13	BSNL	AGM (EB – II)		033-22426000
14	Coast Guard	Dy Commandant	Ravi Kumar	03224-267755

This list should be updated once in three months and, invariably, immediately upon intimation of an impending cyclone.

9. Do's and Don'ts

Following are the Do's and Don'ts for members of the public in the face of a cyclone. The list is not exhaustive.

Before the Cyclone season

- Check the house; secure loose tiles and carry out repairs of doors and windows.
- Remove dead branches or dying trees close to the house; anchor removable objects such as lumber piles, loose tin sheets, loose bricks, garbage cans, sign-boards etc. which can fly in strong winds.
- Keep some wooden boards ready so that glass windows can be boarded if needed
- Keep a hurricane lantern filled with kerosene, battery operated torches and enough dry cells.
- Demolish condemned buildings.
- Keep some extra batteries for transistors.
- Keep some dry non-perishable food always ready for use in emergency.

When the cyclone has crossed the coast

When the Cyclone starts

- Listen to the radio (All India Radio stations give weather warnings).
- Keep monitoring the warnings. This will help you prepare for a cyclone emergency.
- Pass the information to others.
- Ignore rumours and do not spread them; this will help to avoid panic situations.
- Believe in the official information
- When a cyclone alert is on for your area continue normal working but stay alert to the radio warnings.
- Stay alert for the next 24 hours as a cyclone alert means that the danger is within 24 hours.
- When your area is under cyclone warning get away from low-lying beaches or other low-lying areas close to the coast.
- Leave early before your way to high ground or shelter gets flooded.
- Do not delay and run the risk of being marooned.
- If your house is securely built on high ground take shelter in the safe part of the house. However, if asked to evacuate do not hesitate to leave the place.
- Board up glass windows or put storm shutters in place.
- Provide strong suitable support for outside doors.
- If you do not have wooden boards handy, paste paper strips on glasses to prevent splinters. However, this may not avoid breaking windows.
- Get extra food, which can be eaten without cooking. Store extra drinking water in suitably covered vessels.
- If you have to evacuate the house move your valuable articles to upper floors to minimize flood damage.
- Ensure that your hurricane lantern, torches or other emergency lights are in working condition and keep them handy.
- Small and loose things, which can fly in strong winds, should be stored safely in a room.
- Be sure that a window and door can be opened only on the side opposite to the one facing the wind.
- Make provision for children and adults requiring special diet.
- If the centre of the cyclone is passing directly over your house there will be a lull in the wind and rain lasting for half an hour or so. During this time do not go out; because immediately after that, very strong winds will blow from the opposite direction.
- Switch off the electrical mains in your house.
- Remain calm.

When Evacuation is instructed

- Pack essentials for yourself and your family to last a few days. These should include medicines, special food for babies and children or elders.
- Head for the proper shelter or evacuation points indicated for your area.

- Do not worry about your property
- At the shelter follow instructions of the person in charge.
- Remain in the shelter until you are informed to leave
- Post-cyclone measures
- You should remain in the shelter until informed that you can return to your home.
- You must get inoculated against diseases immediately.
- Strictly avoid any loose and dangling wires from lamp posts.
- If you have to drive, do drive carefully.
- Clear debris from your premises immediately.
- Report the correct losses to appropriate authorities.

Mock Drill on Cyclone

Observer's report

District _____ Block _____ Police Station: _____

Mock drill site _____

Date _____ Time from _____ to _____

Debriefing at _____ Debrief chaired by _____

Minutes: Memo. no. _____ dt. _____ circulated on

1. Observer:

Name _____ Orgn. _____

Designation _____ Email _____ Ph/ Mobile no. _____

2. Dissemination of information

- (i) Central Communication Centre: Exists/ Does not exist
- (ii) Information dissemination started at: _____ hrs.
- (iii) Nodal officers that could be contacted: _____ nos.
- (iv) Nodal officers that could not be contacted: _____ nos.
- (v) Whatsapp group: Exists/ Does not exist. Used/ Not used
- (vi) SMS group: Exists/ Does not exist. Used/ Not used

3. Was the electricity supply suspended for the exercise? Yes/ No

4. Were the telephone networks suspended for the exercise? Yes/ No

If yes, how did the nodal officers communicate with each other/ their headquarters?

5. (i) Assembly point: Earmarked/ Not earmarked

(ii) Alternate assembly point: Earmarked/ Not earmarked

6. Response time of different stake holders:

Team	Contacted at	Targeted reaching time	Reached at/ Did not reach/ Not applicable
CD QRT team			
CD Medical team			
CD Water Wing			
CD Divers			
DMG team			
Fire fighting team			
District Medical team/ Casualty service			
Police			
Municipal team			
NDRF			
SDRF			

7. SOP prepared and available with which authorities?

8. SOP not prepared by which authorities?

9. Availability/ functionality of the following equipment in the CDRV:

Sl	Equipment	Prescribed quantity Big/ Mini	Available quantity	Functional quantity
1	Fluorescent Orange Reflective ID Jacket	25/10		
2	Heavy duty working gloves	05		
3	Life Jacket with reflective panels	05		
4	FRP Industrial safety Helmet with chin strap (without visor)	10		
5	FRP Industrial safety Helmet with chin strap with Visor	02		
6	FRP Industrial safety Helmet with	02		

	chin strap with LED Light			
7	Disposable Mask	20/10		
8	Circular Saw with 1 diamond blade and 1 abrasive blade	01		
9	Bullet Chain Saw	01		
10	Hand held rechargeable Search Light with 2 charger	02		
11	Telescopic 40 ft. Aluminium ladder in double extension	01		
12	Semi-Static Kernmantle Rope (100 mtr. roll) 11 m.m.dia	01		
13	Seat Harness Adjustable	01		
14	Screw Carabineer	04		
15	Quick draw with 2 Carabineers	04		
16	Stop Lock descending	01		
17	Tandem pulley	02		
18	Fixed Pulley	02		
19	Foot Tape Sling 150 cm	02		
20	Ascender new manual left and right	01		
21	Sledge Hammer	01		
22	Fire-Axe	02/01		
23	Spade 5 ft.	02/01		
24	Shovel 10" D-handle	04/02		
25	Crowbar 5 ft.	04/02		
26	Fibre Rescue Stretcher with Belt and Canvas Stretcher	03/01		
27	Blanket (Woollen)	02		
28	First Aid Box	02/01		
29	Mega Phone Shoulder Sling Type	02/01		
30	Giri-Giri	01		
31	Search cam	01		
32	Fire Entry Suit	01		
33	Tri pod With Winch	01		
34	Bullet Chain Saw	01		
35	Circular saw	01		
36	Concrete cutting saw	01		

10. Availability/ functionality of other resources:

Sl	Resource	Prescribed	Availability	Functionality
1	Boats			

	Ibuprofen				
16	Calamine Lotion		33	Safety Pins	
17	Mouthpiece for giving CPR		34	Blanket	
			35	Anti venom medication/ injection	

12. Was a green corridor established for evacuating the wounded to hospital? Yes/ No

13. Media briefing:

- (i) Is the location earmarked? Yes/ No
- (ii) Is the spokesperson earmarked? Yes/ No

14. Deficiencies observed:

- (i) _____
- (ii) _____
- (iii) _____
- (iv) _____
- (v) _____

15. Suggestions for further improvement:

- (i) _____
- (ii) _____
- (iii) _____
- (iv) _____

Resources available in vulnerable districts

Resources	E MDP	W MDP	JGM	S 24	N 24	HWH	HGL	BDN	KOL
Sr SOI	1	0	0	1	1	1	1	1	5
SOI	0	0	0	0	0	0	0	0	0
Aragamis	0	0	0	0	0	79	4	0	158
QRT volts	0	7	0	0	0	21	9	16	128
Apada Mitra	200			200					
Nulias	54								
INF boats	2	2	2	2	2	2	2	2	2
CDRV big	1	1	0	1	1	1	1	1	1
CDRV small	1	1	1	1	1	1	1	1	1
Loudhailers	2	2	2	2	2	2	2	2	2
SAT phones	0	0	0	0	0	0	0	0	0
Wireless sets	0	0	0	0	0	0	0	0	0

Equipment in each CDRV

Sl	Equipment	Units Big/ Mini
1	Fluorescent Orange Reflective ID Jacket	25/10
2	Heavy duty working gloves	05
3	Life Jacket with reflective panels	05
4	FRP Industrial safety Helmet with chin strap (without visor)	10
5	FRP Industrial safety Helmet with chin strap with Visor	02
6	FRP Industrial safety Helmet with chin strap with LED Light	02
7	Disposable Mask	20/10
8	Circular Saw with 1 diamond blade and 1 abrasive blade	01
9	<u>Bullet Chain Saw</u>	01
10	Hand held rechargeable Search Light with 2 charger	02
11	Telescopic 40 ft. Aluminium ladder in double extension	01

12	Semi-Static Kernmantle Rope (100 mtr. roll) 11 m.m.dia	01
D3	Seat Harness Adjustable	01
14	Screw Carabineer	04
15	Quick draw with 2 Carabineers	04
16	Stop Lock descending	01
17	Tandem pulley	02
18	Fixed Pulley	02
19	Foot Tape Sling 150 cm	02
20	Ascender new manual left and right	01
21	Sledge Hammer	01
22	Fire-Axe	02/01
23	Spade 5 ft.	02/01
24	Shovel 10" D-handle	04/02
25	Crowbar 5 ft.	04/02
26	Fibre Rescue Stretcher with Belt and Canvas Stretcher	03/01
27	Blanket (Woollen)	02
28	First Aid Box	02/01
29	Mega Phone Shoulder Sling Type	02/01
30	Giri-Giri	01
31	Search cam	01
32	Fire Entry Suit	01
33	Tri pod With Winch	01
34	Bullet Chain Saw	01
35	Circular saw	01
36	Concrete cutting saw	01

Desirable resources at each vulnerable point

Resources	Desirable
Sr SOI	1 (for district)
SOI	1
Aragamis	3 per boat
QRT volts	8 + 1 (Dvr) per CDRV big and 6 + 1 (Dvr) per CDRV small
Apada Mitra	10
Nulias	10 at each coastal point
INF boats	4
CDRV big	1
CDRV small	1
Loudhailers	2

SAT phones	1 per CDRV and 1 per Sr SOI/ SOI
Wireless sets	1 per CDRV and 1 per Sr SOI/ SOI
Hurricane lanterns	2 per CDRV and 2 per Sr SOI/ SOI
Candles	Adequate levels at least for 3 days

Thus, if there are five vulnerable points for a district, e.g., for East Medinipur – Digha, Mandarmani, etc., the above should be multiplied by five.