

### Annexure1: India's Average Annual Loss by Disasters

SI No	Disaster	Loss in million \$
1	Earthquakes	19
2	<b>Cyclones</b>	<b>447</b>
3	Storm Surge	727
4	Tsunami	1160
5	Flood	7472
Total		9825

#### India's average annual loss per year

Source: Global assessment Report 2015 of UN office for Disaster Risk reduction,  
Times of India, New Delhi, 11 Mar 15

**Annexure 2: MAJOR TROPICAL CYCLONES TO HIT INDIA IN THE LAST 115 YEARS**

SI No	Year	Country	Deaths
1	1897	Bangladesh	175000
2	1942	Contai, West Bengal, India	15000
3	1961	Bangladesh	11468
4	1963	Bangladesh	11520
5	1965	Bangladesh	19229
6	1970	Bangladesh	300000
7	1971	Paradip,Odisha,India	10000
8	1977	Divi Seema, Anndhra Pradesh	10000
9	1991	Bangladesh	138000
10	1999	South Paradip,Odisha,India	9893
11	2013	Gopalpur,Odisha,India	44
12	2014	Vishakapatnam, Andhra Pradesh	124

**Table 10: Major tropical Cyclones**

Source : <http://www.indiaenvironmentportal.org.in/files/extreme%20events.Pdf>

### **Annexure 3: QUESTIONNAIRE FOR FOCUSSED DISCUSSION**

A questionnaire was used for strengthening the outcome of the research. The questionnaire was given to domain experts in the field. The experts consulted are as below:-

- (a) Dr KJ Ramesh : Scientist G IMD & Advisor MoES.
- (b) Dr Satyendra Singh : Former Executive Director, NIDM.
- (c) Prof Vinod K Sharma : Prof IIPA, Vice Chairman Sikkim State  
Disaster Management Authority

#### **Questionnaire**

1. Is an EWS very effective in limiting damage in case of a cyclone?
2. Is pre-disaster measures more effective than post-disaster measures for Disaster Risk Reduction?
3. Which states in India has effective EWS system?
4. Has EWS improved after Odisha Super Cyclone?
5. Has IMD modernized their monitoring and forecasting system/equipments to improve the accuracy of warning after Odisha Super Cyclone?
6. How important is a communication system in EWS?

7. Has IMD modernized their communication system/equipments to improve the dissemination of warning to all coastal villages after Odisha Super Cyclone?
8. Do you think present communication system is sufficient or needs to be improved?
9. Have steps been taken to increase the lead time available in case of cyclone warning?
10. Has there been improvement in prediction of storm surge, rainfall Landfall site etc.?
11. How many hours notice is available in case of initial warning?
12. How many hours notice is available in case of prediction of accurate landfall?
13. Is there inter-region or inter-govt cooperation to share knowledge/warning in case of EWS?

**Annexure 4: COMPARISON OF DAMAGE IN ODISHA SUPER  
CYCLONE AND CYCLONE PHAILIN**

SI No	Description	Odisha Super Cyclone	Cyclone Phailin
1	Loss of Human Lives	9983	23 due cyclone 21 due rain, house collapse etc
2	Damage to Homes	1958351	2.34
3	<u>Damage to crop</u> Paddy Non Paddy	1810091 hectare 32950 hectare	2.54 Lakh hectare total
4	Roads Damaged	13253 km	Fig Not Available
5	EHT Power Towers damaged	39	54

**Table 11: Comparison Of Damage In Odisha Super Cyclone And Cyclone Phailin**

**Annexure 5: COMMUNICATION FACILITIES ADDED AFTER**  
**ODISHA SUPER CYCLONE**

**VHF Communication Systems**

- (a) An exclusive civil VHF network is now available with all 30 districts covering District Control Room, all Block Head Quarters, and some Tahasils, Sub-Collectors and ADMs and some of inaccessible GPs.
- (b) The user offices have been imparted training regarding operation of the VHF equipment.
- (c) Batteries have been provided to all VHP base station as power back up.
- (d) Vehicle mounted VHF base to the staff car of Collectors / SRC / MD, OSDMA and VHF handsets have been provided to all district control rooms.
- (e) In addition to the above system, the existing police wireless systems also will function for receipt and dissemination of information during cyclone.

**Satellite Phone**

- (a) Procured - 22 nos.  
Revenue Control Room - 01  
District Collectors - 16  
(Cuttack, Puri, Jagatsinghpur, Kendrapara,  
Jajpur, Bhadrak, Balasore, Mayurbhanj,

Sambalpur, Ganjam, Rayagada, Nawarangpur,  
Malkangiri, Koraput, Sundargarh, Angul)  
SRC, Orissa - 01  
OSDMA - 02 (Fixed with Provident antenna)  
Vehicles – 02 (Mounted voyager antenna with Inmarsat Terminals).

- (b) The Collectors of the above districts have been instructed to keep the batteries of the SATPhones in charged condition and to make test calls to OSDMA on the 1st working day of every month. The ID Numbers of the Satellite Phones available with all users are available.
- (c) Two more SAT Phones have been received from MHA recently.

### **Free Power Radio**

- (a) Phillips makes Radio procured - 60
- (b) Radios supplied to MPCs of Ganjam District - 11
- (c) Radios supplied to MPCs of Kendrapara district – 09
- (d) Radio to Revenue Control Room - 01
- (e) Radios supplied to 39 MCSs - 39  
(Puri-11, Jagatsinghpur-4, Kendrapara-03, Bhadrak-11, Balasore-10)

### **Wireless in Local Loop (WLL) Phone**

- (a) Two WLL telephones procured and installed in OSDMA and SRC Cell Office Bhubaneswar. The WLL Phones have been provided with unique numbers as follows.  
N SRC Cell Office, Bhubaneswar - 2600999  
OSDMA - 2000888

## Cyclone Warning Dissemination Systems (CWDS)

IMD has installed CWDS stations in 8 coastal districts for dissemination of cyclone related warning.

