

**CHAPTER 6**  
**GUIDELINES AND STRATEGIES TO MAKE**  
**EWS MORE EFFECTIVE**

6.1 **Introduction**

6.1.1 Lam (2005)<sup>37</sup>, states, a good tropical cyclone warning system should be simple, easy to understand, and able to trigger organized responses of the government and orderly collective responses of the public to minimise loss of lives and damage to property. Globalization and advances in information technology has ensure that the meteorological services improve/modernise their warning services and maximise their effectiveness. To achieve the best effect of the warning system, meteorological services should formulate strategies in the design, presentation, operation, dissemination and communication of the warning to maximise its relevance and effectiveness. Due consideration has to be given to the needs of a wide spectrum of users ranging from the underprivileged who need general protection and to sophisticated individuals who could respond to warnings in accordance with their own acceptable risks. Meteorological services should constantly look for opportunities to improve the processes and presentations of warning information to meet the expectations and needs of the public and special clients, harnessing the advancement in computer and telecommunication technologies and techniques. Synergizing the power of the media and innovative telecommunication means to promote the intelligent use of warnings could further enhance the effectiveness of warnings.

6.1.2 Many coastal villages bore the brunt of Cyclone Phailin's impact. Early warning enabled coastal villages to be evacuated, especially those in Puri and Ganjam districts in Odisha. As many as 102,000 residents of Puri district and

---

<sup>37</sup> <http://www.hko.gov.hk/publica/reprint/r582.pdf>

180,000 residents of Ganjam district were evacuated. Ganjam and Puri districts were two of the few districts that received special warnings from the OSDMA on 10 October, two days before the cyclone's landfall, to evacuate those living in mud houses and low lying areas before. Globally, the number of lives lost to such as cyclones, has decreased 10 times, yet the recorded economic losses have increased manifold. The decrease in loss of life can be attributed to the formulation of policies pertaining to disaster risk reduction (DRR) and linking national and local levels to development of early warning systems (EWS), preparedness and planning. In addition, as countries continue to develop and urban growth increases, the quantity of assets exposed to disasters will increase as well. To reduce future economic loss and impacts on livelihoods, overarching DRR management plans, in conjunction with EWS, could be developed to establish medium- and long-term plans that address appropriate land use zoning, development of infrastructure and agricultural planning. It is of paramount importance to mention that the best of Early warning system would be useless without preparedness and response post cyclone. In cyclone Phailin ten number of deaths were in two compared to 9800 plus deaths in super cyclone, which was clearly because close to 5 lakh were evacuated. Thus compared to 24 hr advance warning received 24 hrs in advance in the case of the super cyclone (in 1999), 120 hrs of advance notice definitely helped evacuate more people early.

6.1.3 NDMG (2008), notes, that the approach to Disaster management (DM) is to ensure all the components of DM cycle i.e., Pre-disaster, during disaster and post disaster is institutionalized and the four phases of DM are covered namely; Prevention and mitigation (Pre-disaster), Preparedness phase (pre-disaster), Response and Recovery (during and Pre-disaster) and Rehabilitation and Reconstruction (post disaster). This will help create well informed community prepared to face cyclone-related emergencies with minimal loss of life and property. The Panchayati Raj Institutions and the Urban local body will also be encouraged to be prepared to implement DM related guidelines effectively.

6.1.4 Appropriate DM plans at the national and state/UT levels will ensure efficient and coordinated management of cyclones. Various stakeholders/agencies—along with their responsibilities, must institutionalise programmes and activities at the ministry/department levels, increase inter-Ministerial and inter-agency coordination and networking, as well as rationalise and augment the existing regulatory framework and infrastructure. DM plans at various levels, wherever existing, will be further revamped/ refined to address both immediate and long term needs. Implementation of the guidelines will begin with formulating a DM plan and an enabling phase to build the necessary capacity. The Nodal ministry will evolve its DM plans to ensure a well coordinated management of cyclone emergency. All the concerned ministries' and stakeholders' interests are represented in an inter-ministerial group and all major relevant areas are addressed. This will ensure all concerned ministries are in agreement and action their part of the guidelines. The agenda of these guidelines will also be implemented by the governments of the various states and UTs. Mid-course corrections wherever necessary is to be made. Long-term policies need to be formulated based on experience from experience gained from implementation of short term plans. Coastal states and UTs will develop their DM plans through an extensive consultative approach covering all stakeholders and in conjunction with their district-level plans.

## 6.2 **Implementing the Guidelines**

6.2.1 A Plan at the national level, spelling out detailed work areas, activities and agencies responsible, with targets and time-frames. The plan thus prepared will also specify indicators of progress to enable their monitoring and review. The National Plan will be prepared by NEC, based on the guidelines, and implemented with the approval of NDMA.

6.2.2 The ministries/agencies concerned, in turn, will ensure that:-

- (a) Provide guidance on the implementation of the plans to all stakeholders.
- (b) Obtain periodic reports from the stakeholders on the progress of implementation of DM plans.
- (c) Evaluate the progress of implementation of the plans against the time-frames and take corrective measures wherever needed.
- (d) Disseminate the status of progress and issue further guidance on implementation of the plans to stakeholders.
- (e) Report the progress of implementation of the National Plan to NDMA/NEC.

6.2.3 MoES will give regular feedback to NDMA on upgradation of facilities required to improve cyclone warning system on a regular basis.

6.2.4 SDMAs/SECs will develop state/UT-level DM plans on the basis of these guidelines. SDMAs will approve these and keep NDMA informed. The state departments/authorities concerned will implement and review the execution of DM plans at the district and local-levels along the above lines.

#### 6.2.5 **Implementation and Coordination at the National Level**

Planning, implementing, monitoring and evaluating are four facets of the comprehensive implementation of DM plans. agencies, institutions and specialists with expertise in relevant fields, are involved in making national, state and district level plans. Feedback is given to NDMA on a regular basis.

Professionals are under tremendous pressure to improve their skills and expertise corresponding to best practices the world over and to contribute to capacity development. A single window system is adopted for the conduct and documentation of each of the above four phases and a coordinator is detailed to oversee this implementation.

### **6.3 Institutional Mechanism and Coordination at State and District Levels**

6.4.1 On the lines of the measures indicated at the national level, SDMAs and DDMAAs will also identify appropriate agencies, institutions and specialists with experience in relevant fields and involve them in various activities to help implement the cyclone DM plans. Likewise, measures indicated at the national level, such as designating a nodal officer in each line department, will achieve similar objectives.

### **6.4 Financial Arrangements for Implementation**

6.4.1 DM in India was not given due importance as an issue of providing relief and rehabilitation to the people affected by natural calamities. The new vision of Gol is a paradigm shift in the approach to DM: from the erstwhile relief-and-response-centric approach to a holistic and integrated approach— which will also be a pro-active prevention, mitigation and preparedness driven approach. These efforts will conserve developmental gains, besides minimising loss to lives, livelihood and property. This would, therefore, be the underlying principle for the allocation of adequate funds at all levels for prevention, mitigation and preparedness, along with strengthening the relief and rehabilitation machinery.

6.5 **Implementation Model** These guidelines will come into force with immediate effect. The implementation model will cover actions in two phases. First phase to be operational from 2008-2010 and the second phase from 2008-2012. The DM plan will indicate detailed work areas and

activities/targets with suggested time-frames and suitable indicators of progress along with the authorities/stakeholders responsible for implementing the guidelines. Different milestones and appropriate monitoring mechanisms will also be indicated. The activities in Phase I will lay the foundation for cyclone risk minimisation with adequate protection to coastal zones and the safety of vulnerable coastal communities. In the subsequent phases, the activities will be further intensified and special efforts will be made to consolidate the lessons of Phase I in mobilising more effective participation of stakeholders for achieving cyclone risk reduction.

6.6 Gupta and Sharma (1999), a few major issues which emerged after the Odisha Super Cyclone helped in bringing in urgency in taking forward the Disaster Risk Reduction process and DM. A few issues are highlighted here.

#### 6.6.1 **Emerging Ecological Issues**

Loss of trees in large no will disturb the ecological balance. This would force the villagers to go to the forest for wood thus losing more forest cover. This in turn will affect the climate. Incursion of salt water will make land unfit for cultivation. Some of the long term issues are:-

- (a) **Change in Climate-** May result in extreme climates, drought, floods etc.
- (b) **Destruction of Bio-diversity-** The entire coastal region has abundant horticultural and agricultural species, which could affect crop, tree and cattle diversity.
- (c) **Drinking Water Crises.** Saline water incursion has made water unfit for use.



- (d) **Mangrove Destruction.** Tidal water not able to recede because of infrastructure increase blocking the path of water

#### 6.6.2 **Planning Issues.**

(a) **Settlement in Vulnerable Areas** Super cyclone had maximum effect on middle coastal Odisha. High rate of growth of population, low forest cover resulting due to unplanned farming. Disaster preparedness was abysmally low and more than 80% houses being temporary (thatched, Tiled and mud wall houses).

(b) **Need For Development Regulation, Environmental Guidelines and Infrastructure standards** The Need for development is urgent but developmental regulations also need to be stressed alongside. Houses are rebuilt in the same way (temporary Structure). Villagers have to be educated about low cost cyclone resistant material and method of building houses. Trees with deeper roots need to be planted, raising of Mangrove and Coastal forest. In coastal region 500m to be CRZ, with only essential activity permitted. Dense plantation to be carried out. 500m to 5 km to have trees planted around buildings and other structures to break the wind speed. Developmental activities may be permitted beyond 10 km. Minimum standards of design needs to be enforced for power and communication towers as they get affected very easily. Design to be 1.2 times the wind speed withstanding capability. Storing of tower material and availability of skilled technicians to repair the infrastructure is to be done. Well planned Cyclone shelters with good accessibility and stocked with food, medicine and fodder to be planned.

### 6.6.3 **Implications for Planning Systems**

Three broad areas of consideration that needs to be kept in mind while making plans are as below:-

(a) **Contingency Component in Development Plans**

Only the Calamity relief fund was available, which is allocated whenever a disaster strikes. Even though it can be used for preparedness planning, this is seldom done. The CRZ needs to be reviewed and made a strong tool for disaster prevention.

(b) **Community Participation and Organization**      Poor

people need to be encouraged to take responsibility on their own. Community organization to be made use for this.

(c) **Design With Nature**      Large number of deaths could have

been avoided if settlements and buildings were on the basis of ecological/natural characteristics analysis of the region. Avoid settlement in the path of frequent cyclones, flood and storms. Settlements/buildings to be planned not farther than 300 m from the nearest Cyclone Shelter.



#### 6.6.4 **Action Points**

(a) **Social Participation** Social preparation is a key aspect of disaster mitigation and rehabilitation. Advantage of involving beneficiary directly ensures shelter provided is as per their need and affordability. Following needs to be considered:-

- (i) Area Selection-Needs to be low hazard, low risk prone accessible.
- (ii) Entry into community.
- (iii) Mobilizing Volunteers for needs Assessment survey.
- (iv) Preparation of team to work on the project.
- (v) Preparation of shelter/housing plans.
- (vi) Organising the construction process.
- (vii) Mobilizing Community Groups.
- (viii) Developing community responsibility.

#### (b) **Core Cyclone Shelters**

Once the Cyclone warning is given there is short time to reach a shelter. Hence the shelter needs to be strong and ideally located to protect these people as their homes would be destroyed. Should be able to withstand wind and not situated more than 300m away from the villagers. These shelters can be multipurpose and should be used as a school or community hall to ensure it is use regularly and maintained.

(c) **Guidelines for Cyclone Safe Structures**

**Thatched House**

- (i) Internal partitions increase lateral stability.
- (ii) Diagonal braces with bamboo, split palm tree trunks firmly tied to posts to be provided in walls and partitions.
- (iii) External props may be provided to roof structure by extending the hip rafters and some principal rafters to the ground.
- (iv) Nails, metal straps, wires or nuts may be used to tie the individual members rigidly.

**Tiled Roof**

- (i) Mortar to be used to fix ridge or hip tiles.
- (ii) Intermediate mortar or concrete bands may be provided at 2m intervals on the sloping portions.
- (iii) Roof structure to be tied/nailed/bolted together.

Hipped roofs have survived compared to gable roofs.

### **Low Rise Buildings-AC sheet Roof**

Spread continuous cot of mortar in case of tiled roof. Connection between roof sheets, tile and purlins may be given if roof is of AC sheet.

- (i) Provide wind ties
- (ii) Spacing of Purlin to be maximum 1.40 m.
- (iii) Three 8 mm J-bolt per sheet needs to be provided.
- (iv) Use bitumen and limped washers. Drill holes and then fasten sheet.
- (v) Wooden purlins to be properly fastened to trusses, rafters using nuts, bolts or MS straps.

### **Large Roofs**

For pitched roof J bolt are to be replaced with U bolt. Purlins are to be properly tied to rafter which in turn is fixed to the wall. Steep slope with minimum overhang is to be preferred. Steel columns should have steel anchoring bolts and a firm base plate.

### **HT/LT lines**

Extensive damage to LT lines, distribution lines and communication lines seems to review the design specs adopted. As Odisha comes in zone 5 as per IS code for towers, design was for 180 kmph. 33/11 KV suffered the biggest damage. Poles and fixing arrangements

should break first instead of the pole, to prevent twisting or bending of the pole rendering it useless for future use.

### **Telephone Lines**

Similar exercise as for power lines is required to be done. Stay wire, cross arms and fixing arrangement needs to be reviewed.

## **6.7 Conclusion**

Relief measures involves huge amounts and dealings should be transparent. Wherever public fund is being spent, a notice board of expenditure is required to be displayed. One third of funds has to be disbursed through NGOs with good track record and integrity. Regular auditing should be carried out. Measures enumerated in previous chapters like CVI, Zonal data needs to be referred when planning settlement. The settlement pattern and growth trends to be assessed, future scenarios simulated and safety guidelines need to be developed. Planning systems and methodologies need to be made responsively keeping in mind the peoples requirement and local environment. The impact of cyclone on local population is never assessed fully. As cyclones, rains and storm surge cause untold suffering which are long term in the form of delayed and chain impacts. Based on such an assessment environment guidelines will be developed and existing regulations modified to try be more effective and reduce future disaster or at least reduce the suffering. The environment will thus be able to withstand the impact itself. The state Government and local NGOs are unaware of technical information to go about rehabilitation or preparedness planning. Houses are built the same way as they were, before collapsing or getting damaged. Awareness packages need to be prepared to assist the people.