


Navi Mumbai Municipal Corporation



Government ofMaharashtra


# EARLY WARNING SYSTEM FOR THE CITY OF NAVI MUMBAI

## ACTION PLAN

2015

# ACTION PLAN
# EARLY WARNING SYSTEM FOR THE CITY OF NAVI MUMBAI
# 2016

## Introduction:

The GOI-UNDP Project on "Climate Risk Management in Urban Areas through Disaster Preparedness and Mitigation" supported by USAID covering eight cities with two main objectives to (1) reduce disaster risk in urban areas by enhancing institutional capacities to integrate climate risk reduction measures in development programmes as well as to undertake mitigation activities based on scientific analysis; and (2) enhance community capacities to manage climate risk in urban areas by enhancing the preparedness. Under the project, specific activities have been planned to attain key results such as: City Disaster Management Plans, Hazard Risk and Vulnerability Analysis, training of communities to respond to disasters, action plans to strengthen Early Warning systems based on analytical studies, sectorial plans with key focus on mainstreaming of disaster risk reduction and climate change adaptation in development programmes and knowledge management.

Disaster Management Programmes comprise a plethora of components that include developing policy frameworks, capacity building programmes, and community-based mitigation/response plans -- including Early Warning Systems. However, Urban Early Warning Systems, by and large, are not a regular feature of the DM system of urban governments in India and similar is the case of Navi Mumbai city which has a basic system. It is pertinent, therefore to begin assess the existing EWS in Navi Mumbai city in the face of increasing urbanization and vulnerabilities to disasters.

Under the overall project outputs a study was initiated to assess the existing EWS and emergency communication network in city with the help of ***TARU Leading edge***. TARU was established in 1990 as an institution with trans-disciplinary expertise to engage with India's development challenges. TARU is one of South Asia's most experienced disaster management and mitigation agencies, having undertaken multiple assessment, appraisal, design, implementation and monitoring assignments across the risk and vulnerability, urban development, rural development, housing and infrastructure sectors. TARU has a highly experienced team of qualified personnel with extensive national and international experience who have worked together for 15 years on multiple disaster events, across many sectors. The exercise covered Navi Mumbai's extent of risk exposure, monitoring and warning services, communication and dissemination systems, and its outreach strategy. It has undertaking the following;

- Review the technical design/structure and efficacy of existing early warning system. This will include an assessment of early warning agencies, communications networks, protocols for issue of warning, and transmission to the people. The review should also assess how the residents of the city access the information and how they act upon it.
- Review the **t**echnologies involved in the early warning system network design, technical specifications, up-time performance standards, connectivity and integration with all the important facilities and installations, emergency services, and the DM system in the city.
- Review the mode of collecting information related to hazard events, monitoring, and transmitting it to other agencies, particularly the municipal government and district administration.
- Review the mode and reach of the warning especially last mile connectivity and dissemination plan through mass media, print and audio-visual.
- Review the messages disseminated through the EWS: on timeliness, appropriateness, accuracy, and simplicity parameters.

- Review the service support for maintaining the EWS on a regular basis and ensuring 100 per cent uptime.

**Consultation on Early Warning Study:**

A consultative meeting was organized under the Chairpersonship of Smt. I. A. Kundan, Secretary & Director, Disaster Management Unit, Relief and Rehabilitation, Government of Maharashtra to share the finding of the Early Warning System study undertaken for Navi Mumbai at Sachivalaya Gymkhana, Opp. to Mantralaya, Mumbai on July 8th 2014.

The half day consultative meeting was attended by officials of Navi Mumbai Municipal Corporation as well as other key stakeholders, who have associated to with the working of the EWS at the city level. The objective of the consultation was to share the findings of the EWS study conducted by TARU leading edge and to decide a follow up actions that need to be taken at various levels to strengthen the EWS for the city of Navi Mumbai.

Agenda of the Consultation -

| Duration | Event/Activity |
|---|---|
| ११:०० § ११:१५ | Welcome and introduction of the participants |
| ११:१५ § ११:३० | Briefing of the Project |
| | TEA |
| ११:३० § १३:१५ | Presentation on Study Findings on Early Warning System Study by TARU<br>&<br>Open Discussions on Study Findings with Key stakeholders |
| १३:१५ § १३:४५ | Finalization for the recommendations |
| १३:४५ § १४:०० | Summing up &Closing remarks |

Ms. I. A. Kundan, Secretary & Director, DM Unit, R & R, Forest Department, Govt. Maharashtra welcomed the participants and mentioned that one of the major activities that influence any disaster response is a functional control room. The control room should not only provide information but also collect and analyze the information to support effective response.

It in this context the early warning study undertaken in the city of Navi Mumbai gains importance as it as it tries to understand the existing system and identify the requirement to strengthen it in keeping with the multi-hazard approach.

Following the self-introduction by all the participants, Ms. Abha Mishra, National Project Coordinator, 'GoI-UNDP Project on Climate Risk Management in Urban Areas through Disaster Preparedness and Mitigation' discussed the project objectives and activities initiated in Navi Mumbai. She also provided the rationale for this study on EWS undertaken in Navi Mumbai. She

emphasised the need of robust end to end early warning system in the city to mitigate the impact of disasters. She highlighted the recent event of Odisha to reiterate how the Early Warning from IMD on Cyclone Phailin to the state and effectively communicated to the community helped help authorities as well as community teams to evacuate and save thousands of lives.


Mr. AnupKaranth and Dr Sandhya Rao, Consultant of TARU presented the findings of the EWS study at Navi Mumbai. Under the overall project outputs a study was initiated to assess the existing EWS network in city. The exercise covered Navi Mumbai's extent of risk exposure, monitoring and warning services, communication and dissemination systems, and its outreach strategy. It has undertaking the following;

- Review the technical design/structure and efficacy of existing early warning system. This will include an assessment of early warning agencies, communications networks, protocols for issue of warning, and transmission to the people. The review should also assess how the residents of the city access the information and how they act upon it.
- Review the **t**echnologies involved in the early warning system network design, technical specifications, up-time performance standards, connectivity and integration with all the important facilities and installations, emergency services, and the DM system in the city.
- Review the mode of collecting information related to hazard events, monitoring, and transmitting it to other agencies, particularly the municipal government and district administration.
- Review the mode and reach of the warning especially last mile connectivity and dissemination plan through mass media, print and audio-visual.
- Review the messages disseminated through the EWS: on timeliness, appropriateness, accuracy, and simplicity parameters.
- Review the service support for maintaining the EWS on a regular basis and ensuring 100 percent uptime.

**Along with some of the best practices following key finding of study was shared for discussion;**

- The Maharashtra State Disaster Management Plan addresses planning arrangements at the district level, but there is no distinct urban area specific plan. Within the Navi Mumbai City Disaster Management plan, there is no mention of the institutional mechanism needed within the NMMC to establish and operationalize EWS. Currently The NMMC manages the disaster situation through an small city level EOC (with limited equipment) and 2 Control Rooms. Being a relatively newly developed area, city has been well planned and designed keeping the possible impact of hydro met disaster in mind. Regulatory mechanisms like restriction on activities which can probably trigger an event such as landslide has been put in place.
- City level hazard, risk, vulnerability assessment has not been undertaken and hence there is no means to identify critical infrastructure, critical locations, vulnerable population to enable/ enhance the preparedness and response delivery mechanism. Without a hazard, vulnerability and risk assessment, there are limitation to invoke response and thereby actions to target locations and

group/communities exist. Thus there is an urgent need to conduct the HRVA to improve the response system.

- Currently the onus of dissemination of warning and response lies with the NMMC (DM Cell) through media and other protocols, which restricts the outreach (time, space and communities at risk). Value addition to the warning received by technical agencies is restricted only to visual display (readability) and not enhancing in the quality of warning with additional factors like degree of potential impact and staged response. However, the NMMC is proactive in warning dissemination using the locally available communication modes (sirens and vehicle mounted PAS). Initiative to collect information from the local level is attempted (evident through installation of 19 rain gauge stations).
- Systematic collection, collation, maintenance and updation of relevant data required to make an effective EWS, is limited. City is fully dependent on technical agencies like Regional Meteorological Centre (IMD), INCOIS, Coast Guards for forecast/ information.
- Capacity (human resources as well as infrastructure) to add value or improve the delivery mechanism of forecast/potential impact is yet to be developed.
- There is no separate budget allocation for creation and operationalizing EWS. City has an EOC with 2 Control Rooms and 8 Zonal Officers with specific responsibilities to manage the facilities. The EOC & Control Rooms are mainly geared for relief operations. EOC is manned by government official on deputation with the help of supporting temporarily hired staff, who man it round the year.
- No specific local level detailed forecast/warning exists, however attempts to add value using other sources like Satellite cloud cover, locally installed rain gauge stations is evident. Active awareness building measures are undertaken for frequent hazards. User need assessment has not been undertaken by NMMC to demand specialized products from the technical agencies. It was evident through the discussions that technical agencies work in silos and hardly make effort to understand local user specific need, exception being the fishermen community as they receive customized products for hydro-meteorological hazards which indicates the community to tailor actions.
- No formal linkage except for the protocols defined by the agency's mandate (IMD is mandated/requested to send forecast to specific departments) exists between different agencies. User need assessments (issuing and warning authorities) if conducted would ensure establishment of such linkages. Linkages between local agencies (for an integrated and effective response and action which are timely and cost efficient) like PWD/engineering – health-traffic, if established can stage better response and reduce the overhead costs substantially.
- No formal feedback mechanism between technical agencies and NMMC; between NMMC and communities at risk is existing. If this feedback mechanism is established then reflection and learning process can be ensured which will finally improve the EWS and benefits the Disaster Management System as a whole.

Post presentation Secretary & Director, Disaster Management Unit, Relief and Rehabilitation, Government of Maharashtra has requested for following steps.

1. The proposal from NMMC to declare as a City Disaster Management Authority under the the provision of Disaster Management Act 2005 and the Government of Maharashtra's notification.
2. The detail financial proposal from NMMC for strengthening the Early Warning Systems at Navi Mumbai. The funds for setting up effective EWS can be provided by the Disaster Management Unit, Relief & Rehabilitation, and Government of Maharashtra. Therefore the proposal in this line is expected with the period of one month. Support to prepare the proposal may be taken from UNDP and TARU leading edge.
3. Recommended to review and update the existing City Disaster Management Plan of Navi Mumbai
4. Effective steps to strengthen the Emergency Operation Center at Navi Mumbai as some of the provisions have already been taken into consideration under the budget of Regional Disaster

Management Centre RDMC. In case of additional requirements the detail proposal may be submitted to DM Unit, R&R, Government of Maharashtra.

5. EOC of NMMC needs to set up very close communications with India Metrological Department (IMD) to receive regular localized forecast.
6. The progress reports on aforesaid points are expected on regular basis by Secretary & Director, DM Unit, R&R, Government of Maharashtra.

The meeting was concluded with the vote of thanks to the Chair.

**Following action plan has been developed based on the key recommendations of EWS study:**

| Sr. No. | Key Recommendations | Current Status |
|---|---|---|
| 1 | The proposal from NMMC to declare as a City Disaster Management Authority under the provision of Disaster Management Act 2005 and the Government of Maharashtra's notification. | This has been discussed at NMMC and as per the instructions of Hon. MC the revision in City Disaster Management Committee is proposed. Rest of the processes related to CDMA will be initiated as per the approval from MC. |
| 2 | The detail financial proposal from NMMC for strengthening the Early Warning Systems at Navi Mumbai. | Completed<br>Detail budgetary allocations has been done in the annual budget of NMMC for the year 2016-17 |
| 3 | Review and update the existing City Disaster Management Plan of Navi Mumbai | Completed<br>The updated City Disaster Management Plan for the year 2016 is ready both in Marathi and English. |
| 4 | Effective steps to strengthen the Emergency Operation Centre at Navi Mumbai as some of the provisions have already been taken into consideration under the budget of Regional Disaster Management Centre RDMC | Completed …<br><br>Also needful budgetary allocations has been done in RDMC and the annual budget of NMMC for the year 2016-17 for up gradation of city EOC which is also a Regional Disaster Management Centre |
| 5 | EOC of NMMC needs to set up very close communications with India Metrological Department (IMD) to receive regular localized forecast | Completed …<br><br>EOC of NMMC has set up regular communication system with IMD for regular localised forecast. |
| 6 | Bulk SMS system is operationalized | Completed |
| 7 | 15 Rain gauges has been installed in eight wards of Navi Mumbai | Completed |
| 8 | Coordination mechanism has been established with IMD for receiving regular updated information | Completed |
| 9 | Siren system was reviewed and made functional. This is being managed by Civil Defence | Completed |
| 10 | Budgetary provision has been made for EWS | Completed |

| | | |
|---|---|---|
| | strengthening in the annual budget of NMMC 2016-17. | |
| 11 | Setting up of the end-to-end early warning system process | Under process |
| 12 | Detail Standard Operating Procedures | Completed<br>Detail line departments and ward level SOPs have been prepared |
| 13 | Media add value through display of visual aids, which include location and severity of the event. | Completed …<br>Local TV/cable channels are involved in warning dissemination |
| 14 | Arrangement for night time warning (limited to floods, landslides, cyclones, tsunamis) | Completed …<br>Arrangements are in place for dissemination of warning, 24 h, round-the-clock |
| 15 | Risk assessment and integration with potential impact assessment (identification, mapping, integration) | HRVA study for both physical and social vulnerabilities assessment and analysis is in process. The finding and recommendations of the HRVA will be included in CDMP and also will be used further for strengthening EWS at city level. HRVA is being carried out by JTSDM (TISS) and IIT-B, Mumbai |
| 16 | Warning mechanism for hydro-meteorological hazards (cyclone, severe winds, heat wave, cold wave, extreme rainfall, fluvial flooding, pluvial flooding | In Place..<br>IMD Regional Centre at Mumbai is well-equipped. Forecasts and warning are provided by this centre to NMMC |
| 17 | Advisory mechanism for public health risks (vector-borne and water-borne diseases) | In Place…<br>Health department of NMMC currently issues health recommendations during monsoon months. |
| 18 | Use of modern technology to disseminate warning (hydro-met, public health)<br><br>No technology is used for identification and dissemination of geophysical hazard warning information. Fixed and vehicle mounted PAS with sirens are positioned at various locations for providing hydro-meteorological warning. Health advisory is provided to public at large through local newspapers and local cable TV operators | In Process. |
| 19 | Raising awareness about warnings at city level | In Process on regular basis<br>Awareness is spread through distribution of IEC materials in local languages (pamphlet, booklets), cable TV, radio, programmes in schools/colleges/NGOs/ general |

| | | |
|---|---|---|
| | | public functions) |
| 20 | Monitoring, evaluation and targets for improvement of EWS.<br>Performance monitoring mechanism is not established. | The review of this is in process and it will be completed by October 2016 |

**Focus towards the setting up an end-to-end early warning system at Navi Mumbai**

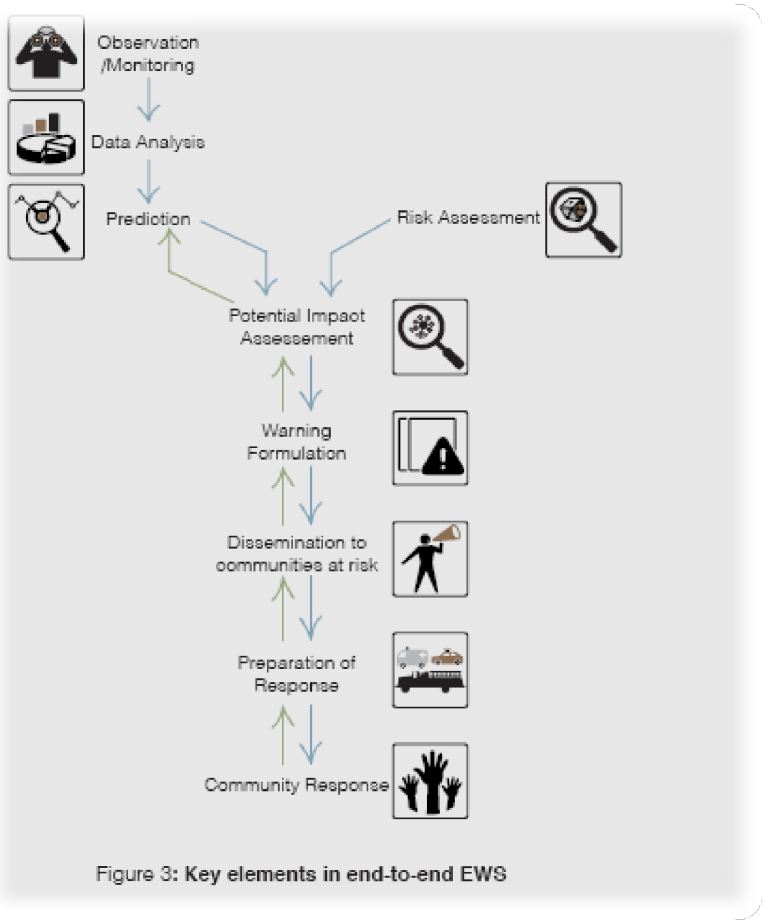


Figure 3: **Key elements in end-to-end EWS**

==========
==========