

Shailesh Nayak the Secretary, Ministry of Earth Sciences, interacted with Sulagna Chattopadhyay from within the precincts of his minimalistic office, providing an excellent overview of India's achievements in cyclone prediction and imminent development in the sector.

Q. The cyclone prediction capacity of India Meteorological Department under your Ministry has increased substantially in the recent years. What are your observations?

Initial indications are critical as cyclones start from the oceans. We need information about temperature and the heat content over the Indian Ocean, enabled through continuous monitoring. Our first step is to figure out which depression will develop into a severe cyclone and which way it will move. These are normally run through models that attempt to define the centre and intensity of a cyclone accurately for different forecast periods, which helps put all other parameters in perspective. Ocean buoys provide the initial location of a cyclone and help monitoring the efficacy of the model and calculating the margin of error. Thus the track is estimated through satellite and oceanic data. As the tropical cyclone comes 300-400 km near the coast the Doppler radar picks it up best and gives a very accurate estimation. This capability that we have achieved has worked consistently. However, that is not to say that there is no further scope of improvement.

Q. What are the Ministry's plans in relation to India's cyclone prediction capacity?

People are severely impacted by intense winds, very heavy rain and storm surge during a tropical cyclone. What is the


likely associated rainfall and what are the regions likely to be inundated by rainfall and storm surge are domains of further research. Although last year onwards we have been able to provide a reasonably good storm surge forecast, which was not possible earlier, a three dimensional (3D) model of the topography, bathymetry and built up area of the coastal region is necessary to provide a better prediction model. Considerable investment and the infrastructure will be needed to create this 3D geospatial information system (GIS). A pilot study was run at Cuddalore in 2007-08, post-tsunami, where the entire area was mapped including each building and their attributes - occupants, type of building, mobile numbers and more so that once the inundation models are run you know exactly whom to contact. We aspire to put that ultimate system in place. We are also trying to put in place a decision support system (DSS) where different sets of data, ground-ship-radar-satellite, are integrated in an automated system that will run various assemblages of models. Currently, scientists do this, but once the DSS is automated, like the tsunami warning system, it will not only bring objectivity but also provide immediate results. Also, we would like to focus on the fundamental issue of ocean atmosphere interaction and how it brings in changes in ocean productivity. From 1999 onwards we have been observing that once a cyclone crosses, the track shows a marked

increase in chlorophyll and productivity due to upwelling. These are newer areas of research.

Q. Is the Ministry planning to acquire air crafts for cyclone reconnaissance?

Yes. We are now acquiring atmospheric research air crafts that may be deployed during cyclone season to aid a better understanding of cyclogenesis. An air craft can be very useful in providing information on upper ocean interactions with the atmosphere, which along with the satellite, ship/buoy data can allow for an error free prediction model.

Q. Does the Ministry have any cyclone preparedness plan?

I believe every system is based on three aspects—the science, the organisation and the social system. We are concerned with first, but at the same time we attempt to sensitise the other two about correctly interpreting forecasts for effective management of a hazard. A collective consciousness is required to make the system work perfectly. As in the case of cyclone Phailin, the system worked very well and loss of life was minimised to 22. However, subsequent rain and inundation killed 80 people. You see, people do not treat heavy rain as a hazard. It is this lack of consciousness about heavy rain that needs to be bolstered, especially at the school level. 

Cyclone prediction successful, but challenges remain



The cyclone Phailin, says the Secretary, behaved well as it did not deviate from its predicted track, but many tropical cyclones veer north or south. He thus cites the need for continuous validation of forecasts to enable course correction of tropical cyclones, if required.