Note on utilization of Web-Composite Risk Atlas developed under HRVA Study.

The National Cyclone Risk Mitigation Project (NCRMP) is a pioneer project of the Ministry of Home Affairs (MHA), Government of India (GOI) and is being implemented through NDMA with the financial support of the World Bank. The aim of NCRMP is to create suitable physical infrastructure to mitigate/reduce the adverse effects of cyclones. Part of this innovative project involves setting up of a web-based Composite Risk Atlas that would provide a risk management framework for decision makers in the States/UTs and the Central Government to take mitigation steps to protect the people and assets of the country.

2.   A study for Hazard Risk & Vulnerability Assessment was awarded to M/s RMSI Pvt. Ltd. on 7th August, 2013 for duration of 24 months. This was further extended up to 31st October, 2016 . This study aims to provide a robust scientific and practical basis for assessing qualitative and quantitative risk within the 13 coastal States/UTs. The main objectives of the study are as under:

- Develop standardized spatial database, maps and decision support framework for assessing the cyclone and related Hydro-hazard, exposure and vulnerability.
- Identification of "Hotspots" high vulnerability coastal areas for communities.
- Developing a platform for dynamic risk assessment modeling functionalities that will be taken up subsequently under Phase . II (probabilistic risk modelling for multi-hazard) of the NCRMP Project.

3.   The study area includes the coastal stretches that lie up to 10 m (Mean Sea Level) in the 13 States/UTs, which are vulnerable to cyclone hazard.

4.   For developing Prototype Composite Risk Atlas, PMU collected data from various Central Government Department/organizations/agencies such as 10 mt CARTO Digital Elevation Model from National Remote Sensing Centre(NRSC), Discharge data of rivers from Central Water Commission(CWC),Village boundary data base from Survey of India(SOI),Mangrove plantations cover data from Forest Survey of India(FSI), Housing details from Census Commissioner, Cyclone track/intensity from Indian Meteorological department (IMD),Bathymetric data from National Hydrographic Office (NHO) etc.

5.   HRVA Study has been completed for all 13 Coastal States/UTs and their outcomes have been integrated in the Web-based CRA. The three key features of Web-based CRA are:

a.   **Precompiled digital risk atlas**: The precompiled   digital risk atlas is a ready reckoner to understand the cyclone risk in any part of the study area of the State/UT. The precompiled digital risk atlas provides cyclone risk status (low, medium, high, very high) of the analysed State/UT; historic cyclone details; Hazard maps (flood,

wind, surge); Loss maps (Composite loss, flood loss, wind loss, surge loss) for 2,5,10,25,50,100 Yr return periods; Building locations (Resident, Commercial and industrial); Agriculture map; Essential facilities details (Cyclone shelter, fire station, hospital, police station, school); Transportation details (Railway station, Airport, Bridges, roads, Seaports); Utilities (Electricity line, Oil & Gas pipeline, Power plants); others (Coastal plantation, Cultural heritage, Mangroves and Religious places); Admin boundaries(Village, Tehsil, District and State) etc.

b.   **Risk Analyzer**: The Risk Analyzer provides capability to decision makers to update exposure, vulnerability and reassess risk at state/district/taluka level   and generate a local view of the risk atlas. Since, the   local State/UTs decision makers have the most up-to-date information about their exposure, the Risk Analyzer provides flexibility to update information about buildings, infrastructure, critical facilities, population,demography and vulnerability functions. This would enable the stakeholders to generate a more precise estimate of local risk and use such information in mitigation planning and to some extent in response planning.

c.   **The Hotspot** analysis provides the decision makers tool to conduct a micro-level risk analysis of a small area and generate outputs that help in risk mitigation and response planning. The users will be able to update the exposure details and re-run the risk analysis. Based on   the analysis, user will also be able to generate a report that will show the gaps that are increasing the risk.

6.   There are two types of users in the Composite Risk Atlas on restrictive access

i.   Administrator has a privilege to upload the GIS data, modify   the   style and publish the layer on the website. He can also change the configurations to ensure the smooth running of the composite Risk Atlas.

ii.   Normal user can view the Web-based CRA

7. The technical user guide is designed to assist state/UT and central government users in using the Composite Risk Atlas effectively. It can be downloaded from Web-based CRA. Two National workshops on Web- based Composite Risk Atlas have been conducted including all 13 coastal States/UTs for capacity building to ensure maximum usage at policy and planning level for disaster management . Seven State outreach workshops containing detail presentation of Web-CRA, hands- on . session followed by question/answer session have been conducted in different States covering all 13 coastal States/UTs for capacity building to ensure maximum usage at policy and planning level in Environmental/ landuse/contingency planning and implementing mitigation activities for disaster management. All feedbacks received during National Workshops and State Outreach trainings have been incorporated in CRA and shared with States/UTs.

8.   The web based composite risk atlas is developed by customizing the Geonode to suit the requirements of NDMA and other State/UT level stakeholders with usages/updation details as follows.

(a) Assistance in disaster planning, preparedness, response and recovery . this is the dynamic aspect of the application that will allow the users to see the impact of imminent or just occurred disaster on various assets of the country thereby helping in response activities. The application will also provide ground truthing abilities to support recovery operations, followed by inputs for improving planning and preparedness.

(b) Bring all the agencies involved in disaster management under one common platform so that data and information sharing is made easy. This will ensure that most up-to-date information about buildings; infrastructure, critical facilities, population and demographics are available at a centralized place to facilitate the disaster risk reduction efforts country wide.

(c) Sharing outcomes of the study . this will ensure that individuals, researchers, planners, disaster management specialists, first responders, professional engineers, school authorities etc., have access to the different types of vulnerabilities due to various types of hazards that exist throughout the country and they could use that information in their respective work areas.

(d) Provide a platform for deterministic risk assessment that could be later extended for dynamic probabilistic risk analysis. System is scalable and compatible for Phase II modeling and dynamic decision making.

(e) Contains all the maps related to Hazard, Exposure, Vulnerability, hotspots and realistic disaster scenario maps for training and decision support where user can create different scenarios and choose hazard levels.

(f) User would be able to find the shortest route for evacuation using the application.

(g) The state Admin (with an authorized user name and password) can update and edit the database in Web-CRA. Data updation does not need any additional software/equipments. State/UT Admin having GIS knowledge can update exposure data through GIS .shp files in a single go. Without GIS knowledge, also the Admin user can update exposure data in Risk Analyzer by changing the numbers through risk analyzer and then update the base layers.

9.   The Public IP of Web Portal is **120.138.9.49:8000**. States/UTs have been provided with necessary user id/passwords to access Web-based Composite Risk Atlas. You are requested to update information/maps in Web-based Composite Risk Atlas to improve its accuracy and utilise same for environment/ land use /Contingency planning to enhance disaster resilience.