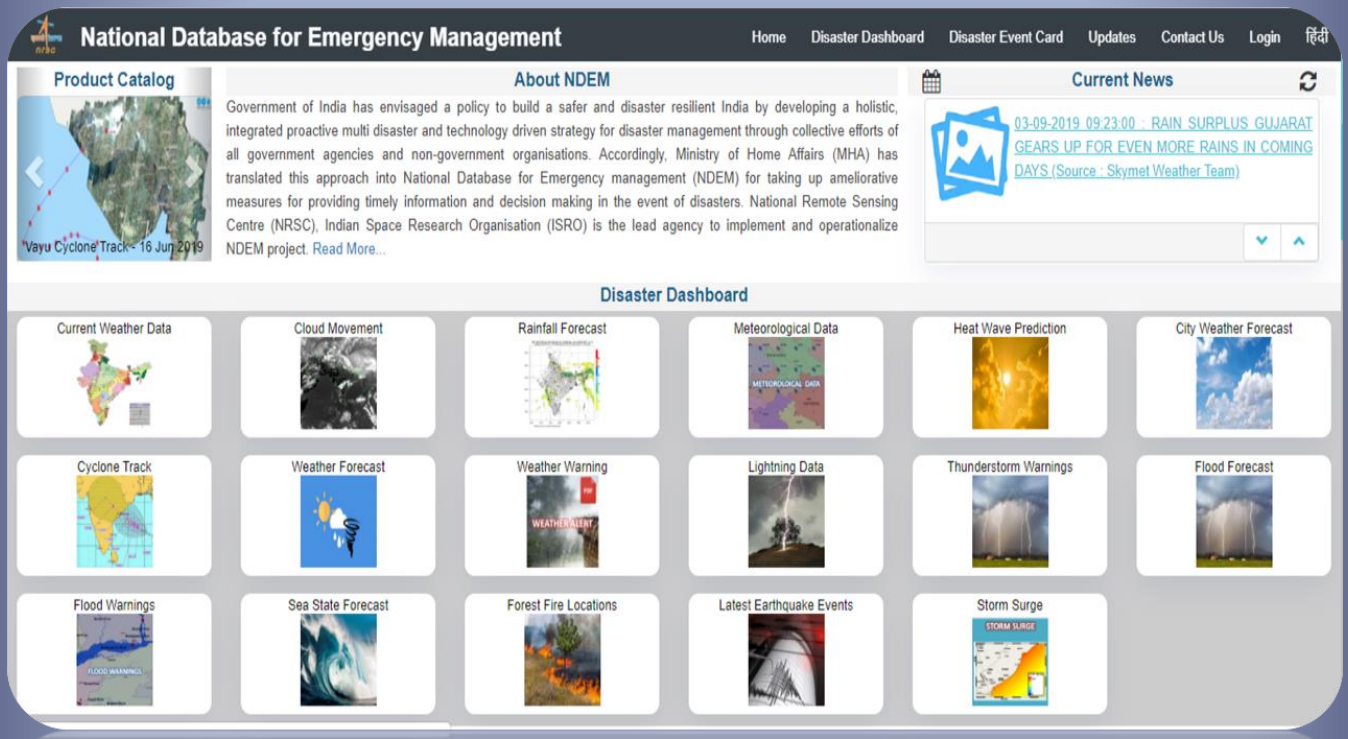
User Guide



NDEM Version 4.0

National Database for Emergency Management
National Remote Sensing Centre
Indian Space Research Organisation
Hyderabad 500 037 TS

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1. Introduction

Towards supporting country's efforts in efficient emergency / disaster management, ISRO has evolved a comprehensive Disaster Management Support Programme (DMSP). Earth observation and satellite based value added products for all possible disasters have been provided for timely support and services for effective disaster management in the country.

1.1. About NDEM

National Database for Emergency Management (NDEM) is a national repository of multi-scale geospatial database along with decision support tools to assist the disaster managers at State/UT, District levels in hazard, risk zonation, damage assessment, preparedness and emergency response. The major objective of NDEM is to provide one stop, single window disaster related services to all stakeholders especially relief managers for accessing NDEM products & services, which will be accessed using various delivery channels (through a geo-web platform, Mobile App) in disaster management sector. The NDEM products and services include:

1. Multi-scale Geospatial database – Base, Thematic, Infrastructure database.
   (Source: NRSC/ISRO)
2. Satellite Imagery -from 5.8 Meter resolution to better than 1 Meter.
   (Source: NRSC/ISRO)
3. IDRN database- Equipment details for supporting relief operations.
   (Source: NIDM, MHA)
4. Decision Support tools- GUI based decision tools for generating evacuation plan, facilities around, optimal route, query builder tools.
   (Source: NDEM)
5. Disaster specific news- Current and recent disaster related news.
   (Source: Authorized news channels).
6. Social Media Information on disasters- Disaster specific Tweets.
   (Source: Twitter)
7. Hourly Meteorological data- Hourly meteorological data parameters (temperature, rainfall, wind speed).
   (Source: IMD)
8. Rainfall Forecast- Rainfall forecast for Next 3days.
   (Source: IMD)
9. Near Real time lighting data: Latest occurred lightening data.

(Source: IMD)

10. Thunderstorm warnings - Real time thunderstorm warnings.
    (Source: IMD)
11. Cloud Movement - Half hourly cloud movement data.
    (Source: MOSDAC/IMD)
12. City Weather Forecast - Past 24 hours weather data and Next 7 days forecast data for major cities.
    (Source: IMD)
13. Heat Wave/Cold Wave Alerts- Daily Heat wave and cloud wave information with alerts.
    (Source: MOSDAC)
14. Cyclone tracks - Event based Cyclone track data.
    (Source: IMD)
15. Flood/Cyclone inundation Maps - event wise periodical inundation maps and products.
    (Source: DSC/NRSC)
16. Flood Hazard Maps - Flood Hazard Maps for States of Assam, Bihar and Odisha.
    (Source: DSC/NRSC)
17. Landslide Hazard Zones - Landslide Hazard Zones maps for Uttarakhand, Himachal Pradesh and North Eastern States.
    (Source: DSC/NDEM).
18. Landslide Early Warning - Daily early landslide warning data for major routes.
    (Source: DSC/NRSC)
19. Earth quake events- Latest earthquake event locations.
    (Source: IMD/INCOIS)
20. Event based Earthquake damage assessment maps - Damage assessment maps for earthquakes.
    (Source: DSC/NRSC)
21. Daily Forest Fire locations - Daily active forest fire locations.
    (Source: DSC/NRSC)
22. Forest Fire Burnt Area Maps -Event based burnt area assessment products.
    (Source: DSC/NRSC)
23. Seasonal Landslide data - Seasonal landslide inventory data.
    (Source: DSC/NRSC)
24. Flood Forecast/warnings, alerts – Daily flood warnings for all river gauge stations.
    (Source: CWC)
25. Storm Surge - abnormal rise in seawater level during a storm (height of the water above the normal predicted astronomical tide).
    (Source: INCOIS).

26. Sea State Forecast - Wave Height and Direction for Arabian Sea, Indian Ocean and Bay of Bengal.
    (Source: MOSDAC)
27. Utility tools - computing of distance, area and adding of geospatial data on map viewer.
    (Source: NDEM)
28. Historical Disaster Specific products - Disaster specific maps and products since 1998 to till date.
    (Source: DSC/NRSC)
29. Interaction Tools -SMS, Broadcast Message, Mail Box.
    (Source: NDEM)
30. Mobile Applications - Mobile Applications for incident reporting, relief management and spatial data collection.
    (Source: NDEM).

At present, NDEM services are extended to all States/UTs up to district level for effective decision making using space based technologies. In addition, NDEM services are also customized to National Disaster Response Force (NDRF) officials for supporting relief and rescue operations. The portal is provided with multi-scale database, decision support tools and mobile apps for relief management.

NDEM Version 1.0 was made operational and services were commenced from August 2013 onwards serving disaster specific products through ISRO-DMS network. Subsequently, NDEM Version 2.0 is released in May 2015 with comprehensive multi-scale geospatial database, decision support tools along with Mobile Applications and event based disaster specific products is deployed on internet domain. These services are disseminated to Central/State level departments. In May 2017, NDEM Version 3.0 is released with enhanced features & services using Free and open-source software (FOSS) technologies powered with open layer 3, bootstrap & Model View Controller (MVC) framework. Presently NDEM services are served to all State/UTs, Districts.

NDEM Version 4.0 is initiated with interactive disaster dashboard, Product catalogue, updates/information on near real time disaster products, disaster event card, decision support tools, query builder, feedback etc. as an update to the presently deployed NDEM Version 3.0. It is platform to facilitate the authorized users for visualization of multi-scale

geospatial database services, decision support tools with near real time disaster products, daily products with alerts / warnings etc. on NDEM platform.

1.2. Objective

The objective of the user guide is to introduce NDEM Version 4.0 geo portal and its features for effective disaster management. It specifically explains the user interfaces and various modules present in NEM Version 4.0 for visualization of multi-scale database, operating decision support tools etc.

1.3. Users of this system

The Users of this NDEM Version 4.0 are authorized Central, State, District, NDRF, SDRF officials for effective disaster/emergency management.

1.4. Accessing NDEM portal

NDEM portal can be best viewed in any modern web browser. It doesn't need any specific software. To access the NDEM V4.0, users need

- ✓ Active Internet Connection and a latest web browser
- ✓ As it is protected site, user name and password are required for accessing the data. The user has to fill the authorization form (Annexure I) with the details of authorized official, duly signed by the competent authority for obtaining user name and password.
- ✓ User authorization form can be downloaded from the 'Important Links' at the bottom of the home page.

☞ Open the NDEM V4.0 in an internet browser by typing below URL in Address bar https://ndem.nrsc.gov.in

- ➢ On successful access of NDEM V4.0 user will be redirect to Home Page of NDEM Portal as shown in **Error! Not a valid bookmark self-reference.**.

Note: On typing the above URL, if the Home page of NDEM is not visible, please see whether the system is connected to internet or not. Please ensure your internet is working.

1.5. Tasks you can perform with NDEM Version 4.0

Using NDEM Version 4.0 geo-portal you can access multi-scale geospatial database services with a set of decision support tools with simple and easy to use GUIs for accessing disaster specific products disseminated from NRSC/ISRO.

The geo-portal is equipped with multi-scale vector maps, satellite data, attribute information for visualization on dynamic scale based rendering with icons, labels, styles etc. The NDEM Version 4.0 consists of multi-scale database of geospatial database for entire country at 1:50,000 scale, multi-hazard prone districts at 1:10,000 scale, and metropolitan cities at 1:2,000 scale. The database is integrated into a uniform framework with set of customized decision support tools. Further, set of Mobile Apps are customized for relief management using NDEM Version 4.0.

The salient modules of NDEM version 4.0 are:

1. **Disaster dashboard** –comprised of various active services like current weather information, meteorological services, disaster forecasts, alerts & warnings from authorized sources.
2. **Disaster Event card** – consists of currently/ongoing active disaster events along with list of products generated.
3. **Product updates** – displays the updates of recently added spatial, non-spatial data products into the portal along with description, source of data and date of hosting it.
4. **Current News/Social Media Inputs** –displays the timely updated disaster related news from various trusted digital platforms and social media.
5. **Online Feedback -**Online feedback form incorporated on home page to submit the feedback about the portal and services
6. **Multi-scale Geospatial Data sets** – The essential database elements with scale based rendering are integrated seamlessly for entire country.
7. **DSS Tools** – GUI based Decision Support System (DSS) tools for decision making.
8. **Utility Tools** – Standard GIS tools like distance, area measurement & geospatial search etc.

9. **Incident Reporting** – Real time disaster event reporting through Mobile Apps, SMS & Portal
10. **Interaction Tools** – Communication system between Disaster management authorities (field to control room) via SMS, Broadcast Message, Mail box.
11. **Mobile Apps** – Android based Apps for Relief Management, Geo-spatial data collection and Geo-tagging of emergency facility
12. **Resource Management** – Allocation & Reallocation of goods/relief material and resources.
13. **State Disaster Reports** – Damage statistics & rainfall data modules are integrated to upload their daily rainfall data and damage statistics from states/UTs to MHA.
14. **Data Repository** – Comprises with India Disaster Resource Network (IDRN) data base for relief management and rescue equipment, socio economic data. and downloadable products (Maps & reports)
15. **IDRN**- Integration of Indian Disaster Resource Network (IDRN) data for search of suitable equipment.
16. **Historic Disaster Product-** Historical disaster products since 1998 to till date.

1.6. References

i. NDEM Version 3.0 user manual is taken as reference to prepare this document.

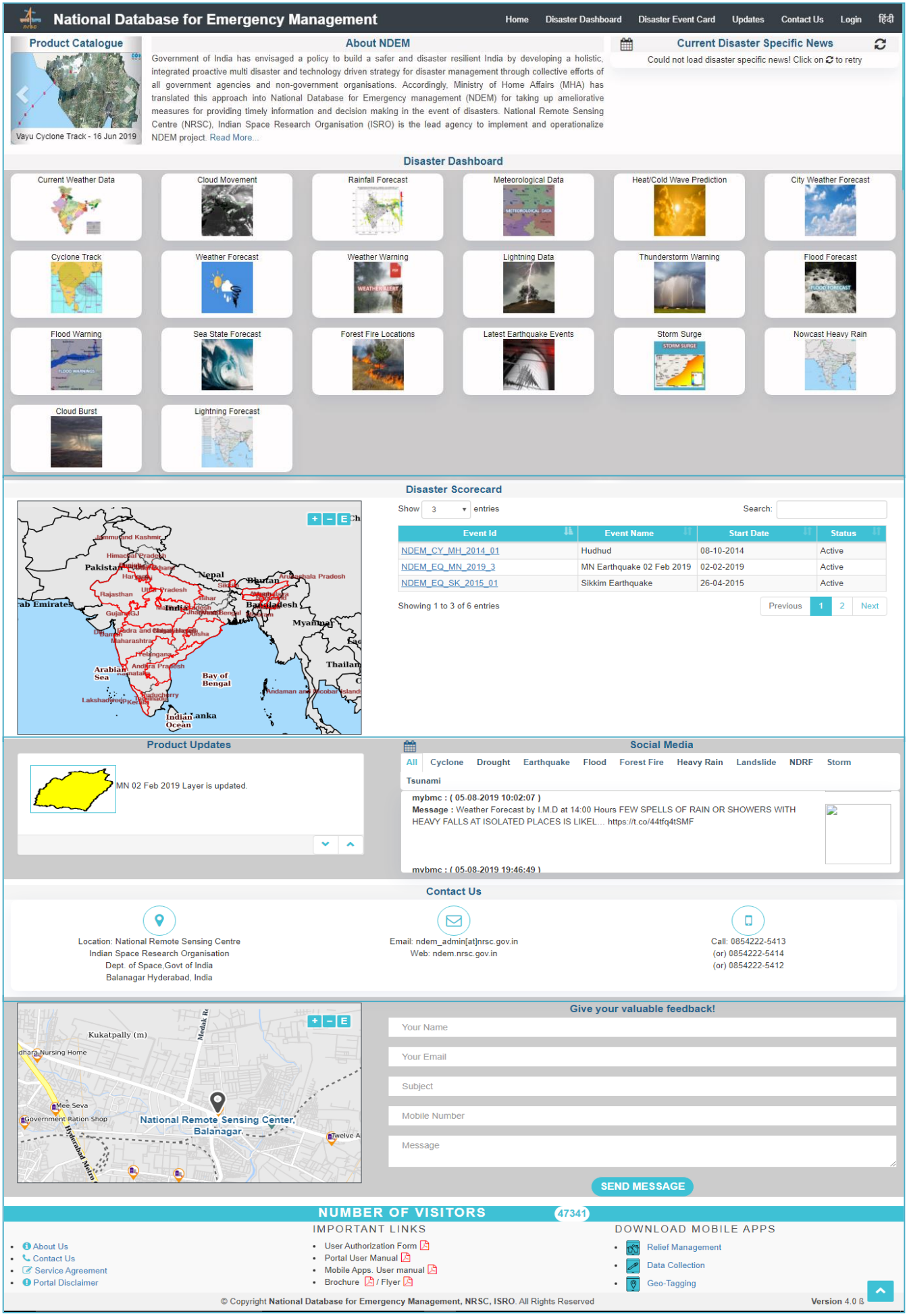


Figure 1 Home Page Outlook of NDEM

2. Home page

NDEM Homepage (**Error! Not a valid bookmark self-reference.**) is made available in bilingual i.e. English & Hindi languages; Based on the convenience user can select either English or हिंदी from the top right corner. The homepage is a composite of several modules such as disaster dashboard, product catalogue, current news, disaster scorecard, product updates & social media information. In home page firstly, the user will observe title and navigation links as shown in Figure 2.

Figure 2 - Title and Navigation Links

2.1. Navigation Links

A navigation bar is placed on the top right side of the Home page. Navigation bar provides links to the locations of the following items (figure 3). By clicking on any of these items, it will be moved to the corresponding area of the home page. The functions of navigation links are:

- **Home**- Redirecting to Home page of NDEM portal.
- **Disaster Dashboard** – Interactive disaster alerts/warnings, products.
- **Disaster Event Card** – On-going/active disaster events information.
- **Updates** – Recent updates on the products and services.
- **Contact us** – Contact Information regarding NDEM activities.
- **Login** – Login form for accessing NDEM modules.
- **हिंदी** – Bilingual option in हिंदी language.

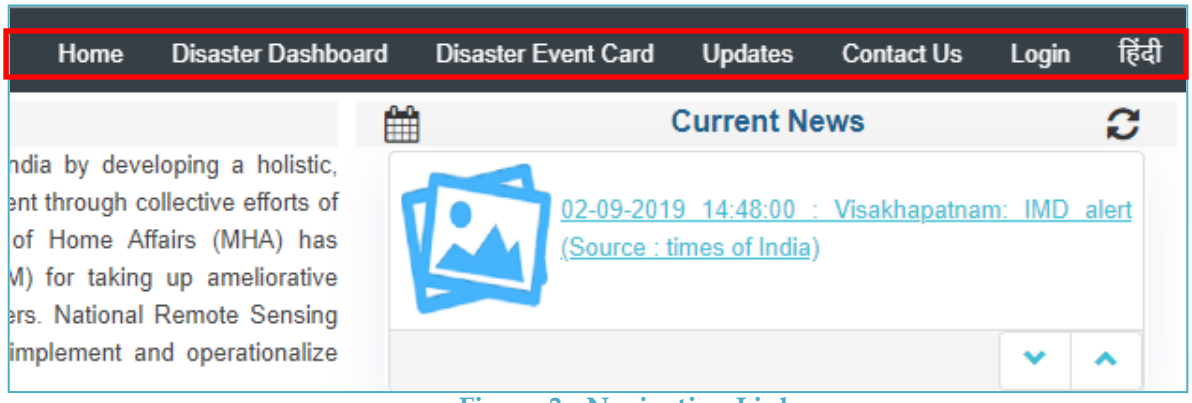


Figure 3 - Navigation Links

2.2. Product Catalog

Product catalogue (figure 4) showcases the major products disseminated by NDEM during past disaster events. Use the right and left hand arrows to move through the list to see the important products served through NDEM. .

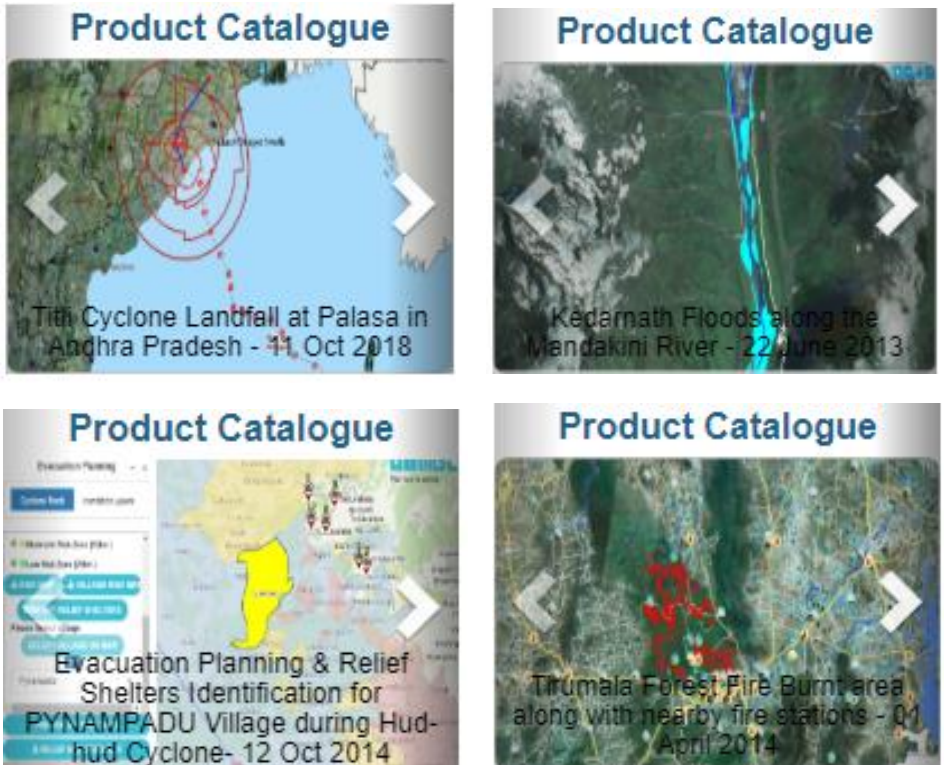


Figure 4 - Product Catalogue

2.3. Current Disaster Specific News

User can view the daily disaster specific news trolled from authorized digital platforms (figure 5). User can also view the past news by selecting a pertained date (figure 6) from the calendar icon. By using up and down arrows user can scroll between the news.

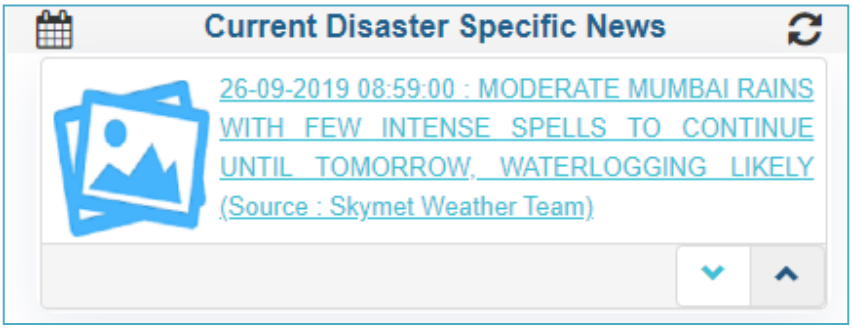


Figure 5 - Current News

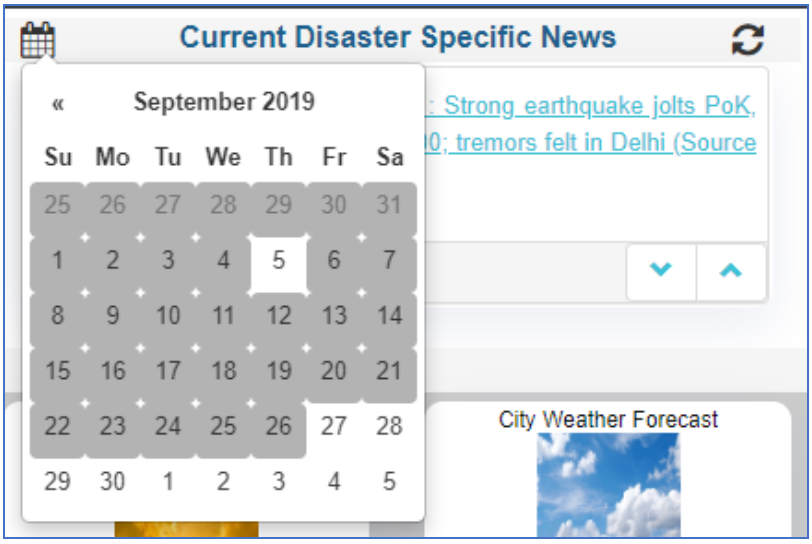


Figure 6 - Selection of past date disaster news

2.4. Disaster Dashboard

Disaster dashboard is single stop up-to-date information for the users from current weather information to the forecasts, alerts/warnings accessing from authorized resources. User can simply click on any thumbnail of these services to visualize the data and products. The following services are integrated in disaster dashboard:

1. **Current Weather Data –** Hourly temperature, humidity rainfall, wind speed etc. from different weather stations across the country.
2. **Cloud Movement -** The cloud movement over Indian region derived from INSAT 3D satellite data.
3. **Rainfall Forecast –** Rainfall forecast of entire country for next 3 days
4. **Meteorological Data - S**urface measurements of different meteorological parameter like rainfall, temperature (Min, Max), and wind speed, wind direction etc. from different Automatic Weather Stations (AWS).
5. **Heat Wave Prediction-** Daily heat wave prediction for entire country
6. **City Weather Forecast -** current weather information and next 7 days weather prediction (rainfall, temp etc.) for a city.
7. **Cyclone Track -** Provides information of tracking and forecasting Tropical Cyclones across Bay of Bengal, Indian Ocean and Arabian Sea.
8. **Weather Forecast-** Weather forecast bulletin for Indian region.
9. **Weather Warnings –** Current weather warnings bulletin.

10. **Lightning Data-** Delivers recent lightning locations across India.
11. **Thunderstorm Warnings –** Provides thunderstorm warnings for next 3 hours.
12. **Flood Forecast –** Advisory flood forecast of inflow and level gauge stations for next 3 days.
13. **Flood Warnings -** the water level information of Central Water Commission (CWC) Flood Forecasting Stations.
14. **Sea State Forecast -** Sea state parameters such as Wave Period, Wave Height, Swell Height and Wind Speed is provided.
15. **Forest Fire Locations -** Active forest fire locations during the fire season for Indian region.
16. **Latest Earthquake Events –** Active and recent earthquake events for Indian region.
17. **Storm Surge –** Information about tidal heights during the cyclone.
18. **Nowcast Heavy Rain –** Satellite based nowcast for Heavy rain events for 6 hours.
19. **Cloud Burst –** Cloud Burst Nowcast for 6 hours over Western Himalayan region.
20. **Lightning Forecast –** Forecast Lightning areas for next 72 hours with a period of 3 hours.

2.4.1. Current weather data

☞ Click on **Current weather** data tab on disaster dashboard

A window popups; drag over the map (Figure 7) to see the temperature data, click on any point it opens a pop-up showing the details of temperature, humidity, rainfall, wind speed & direction etc. The icons are categorized based on the temperature ranging from extremely low to extremely high. User can also search for a city in the search bar; it displays the results on the left side of the window. Use + - E tools for zoom in, zoom out and full extent.

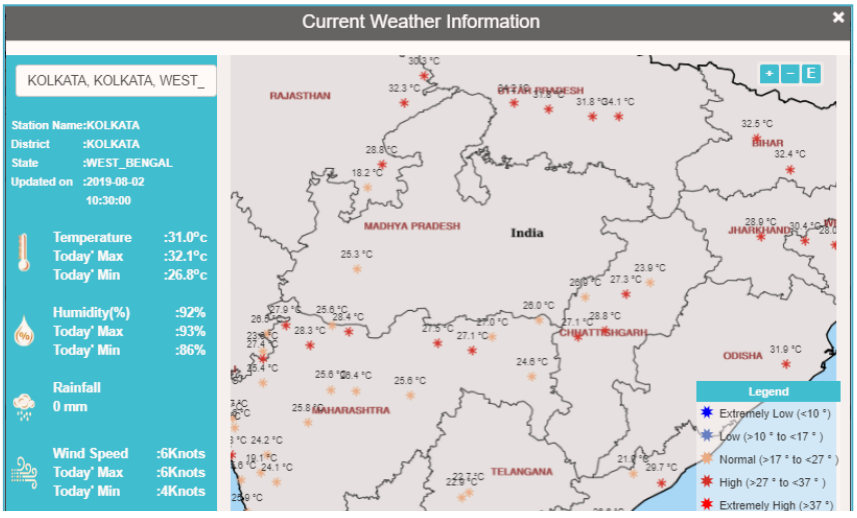


Figure 7 - Current Weather information

2.4.2. Cloud Movement

☞ Click on **Cloud Movement** tab on disaster dashboard

A window popups, it hosts past 24 hour cloud movement data for every half an hour duration, acquired from the INSAT-3D satellite (Figure 8). User can go back to the any previous date by using calendar icon on the top left corner. It gives a link to download the GIF file of the previous data that provides cloud movement, direction etc.

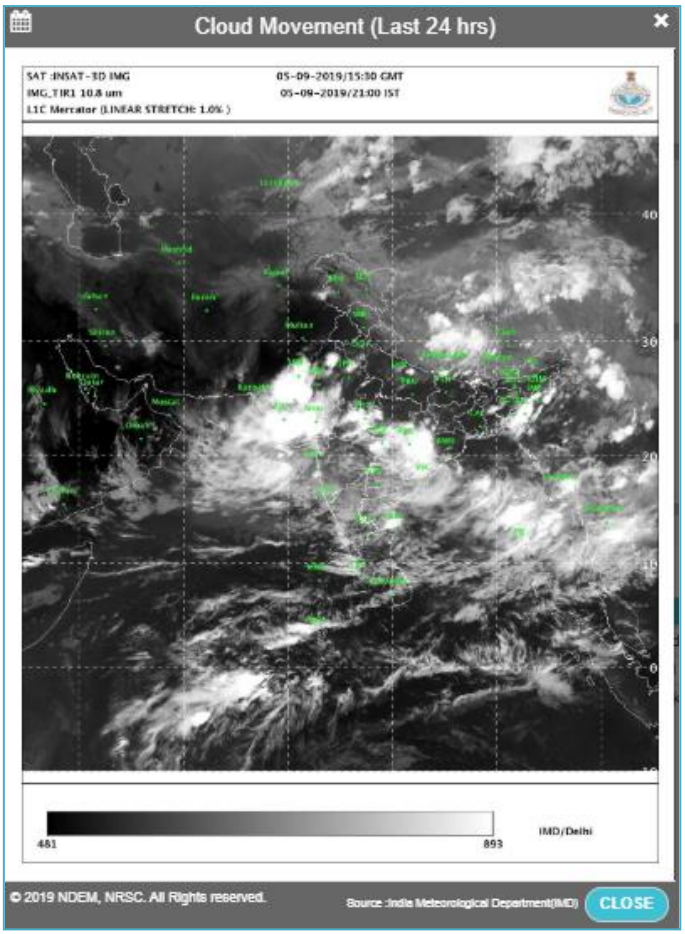


Figure 8 - Cloud Movement

2.4.3. Rainfall Forecast

☞ Click on **Rainfall Forecast** tab on disaster dashboard

A window appears, it is a forecast of rainfall data for a period of 90 hours. The color ramp indicates rainfall range between 0-100 mm. The time zone here represented is UTC (Figure 9).

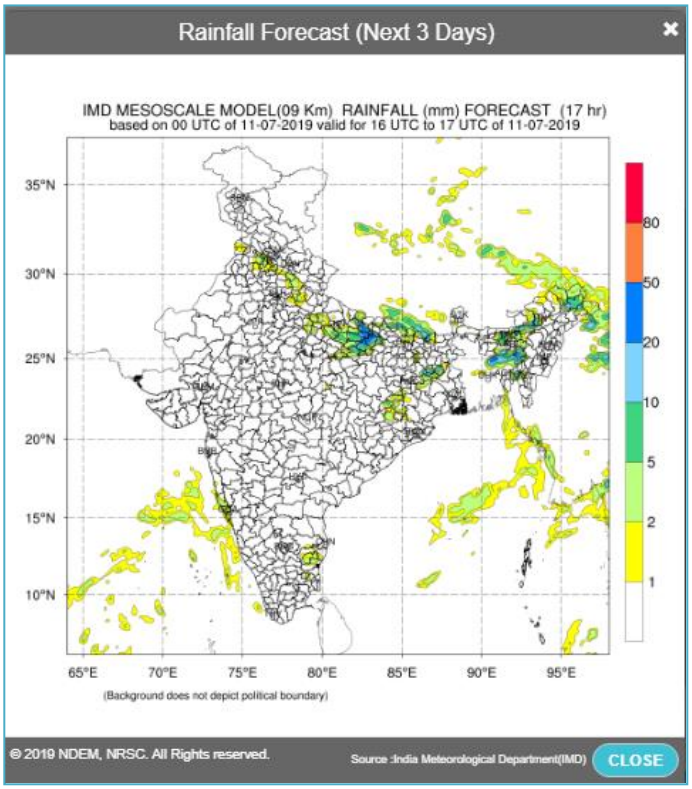


Figure 9 - Rainfall Forecast for next 3 days

2.4.4. Meteorological Data

☞	Click on **Meteorological Data** tab on disaster dashboard.

A window popups as show in the Figure 10; it contains every day records of Rainfall, Temperature & Wind Direction. Select any one of these options given at top left corner. Use calendar icon for previously recorded data, and click on PDF file icon to download a detailed product of the data.

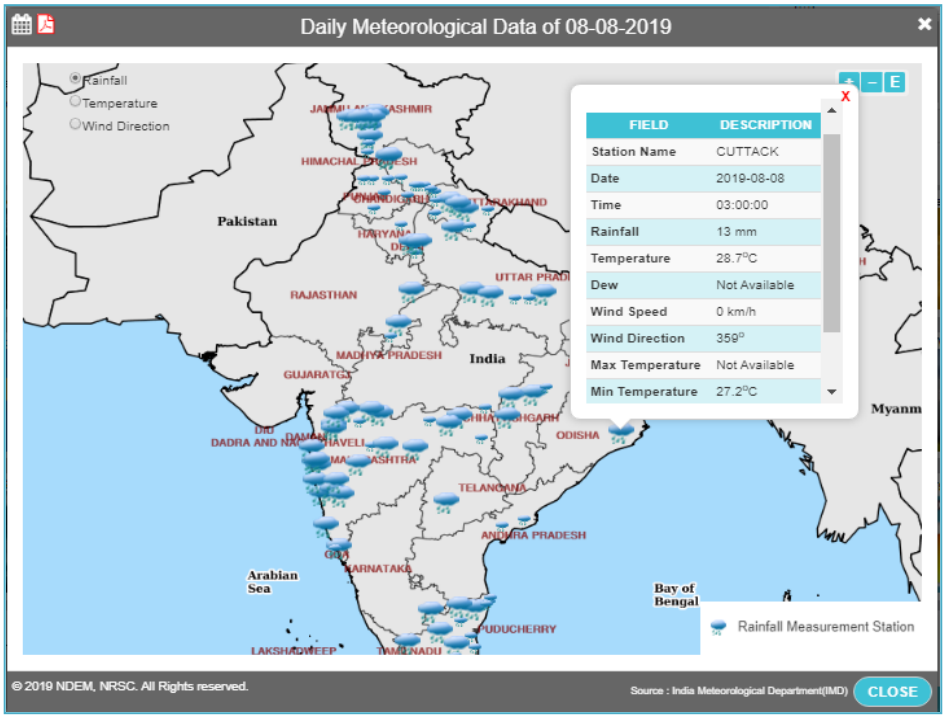


Figure 10 - Current Day Rainfall Data

2.4.5. Heat wave Prediction

☞	Click on **Heat wave Prediction** tab on disaster dashboard

A windows popups as shown in the Figure 11; this module gives the one day prediction of heat wave. It tracks the data of over 2000+ stations nationwide. This data is divided into three categories based on following levels,

i. Extreme (>40 °C)
ii. High (35 - 40 °C)
iii. Normal (<35 °C)

By using mouse, left click any point on the map to see the heat wave data of that station. Use calendar, to visualize the previously recorded data. Download this data by using PDF icon next to it.

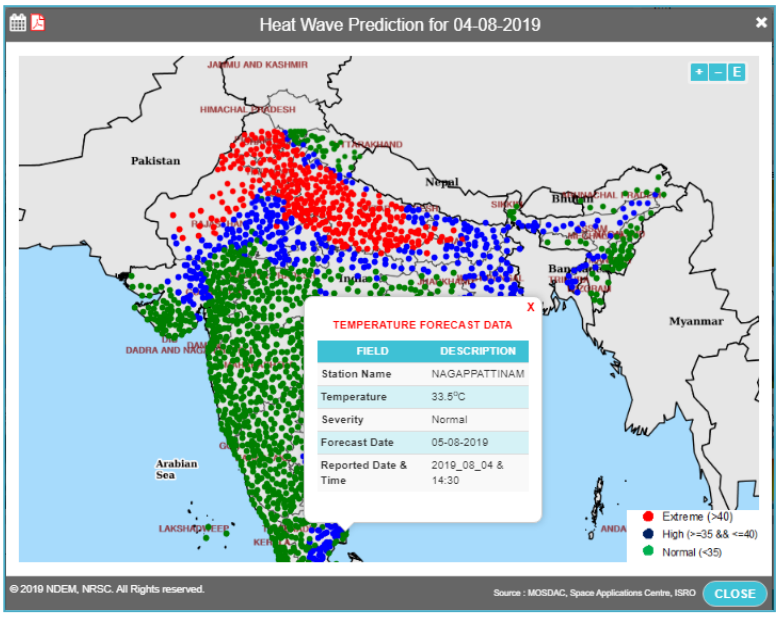


Figure 11 - One day forecast of Heat wave

2.4.6. City Weather Forecast

☞	Click on **City Weather Forecast** tab on disaster dashboard

A window popups (Figure 12); this module gives the information of temperature, relative humidity, last 24hour rainfall, sunrise, moonrise etc. for all major cities. This data includes past 24hour weather data and Next 7 days weather forecast of the city. Change the date in calendar to see the corresponding day weather station details.

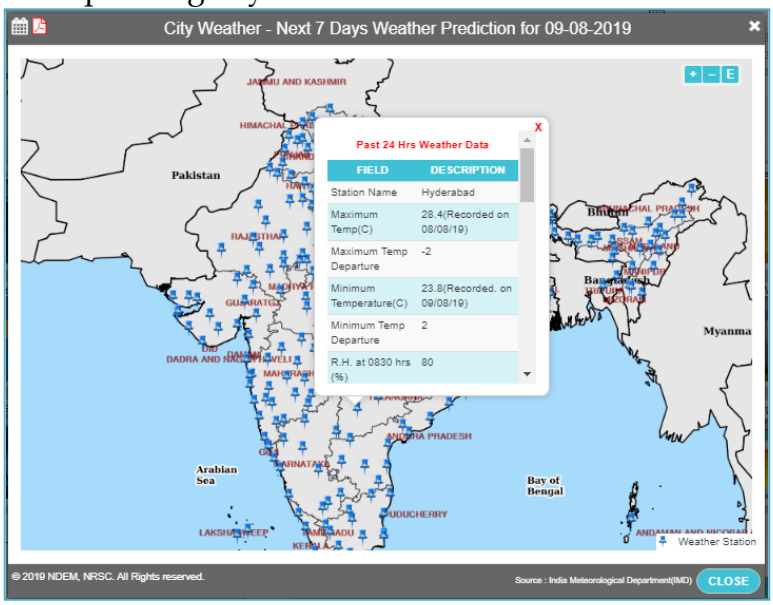


Figure 12 - Forecast for city weather stations

2.4.7. Cyclone Track

☞ Click on **Cyclone Track** tab on disaster dashboard

A window popups (Figure 13); It hosts the live status of the cyclone and its forecasted track, updated timely during the event. It also holds cyclones data since 1990 onwards, which are occurred in Bay of Bengal and Arabian Sea region. The time stamp indicates the duration of the cyclone.

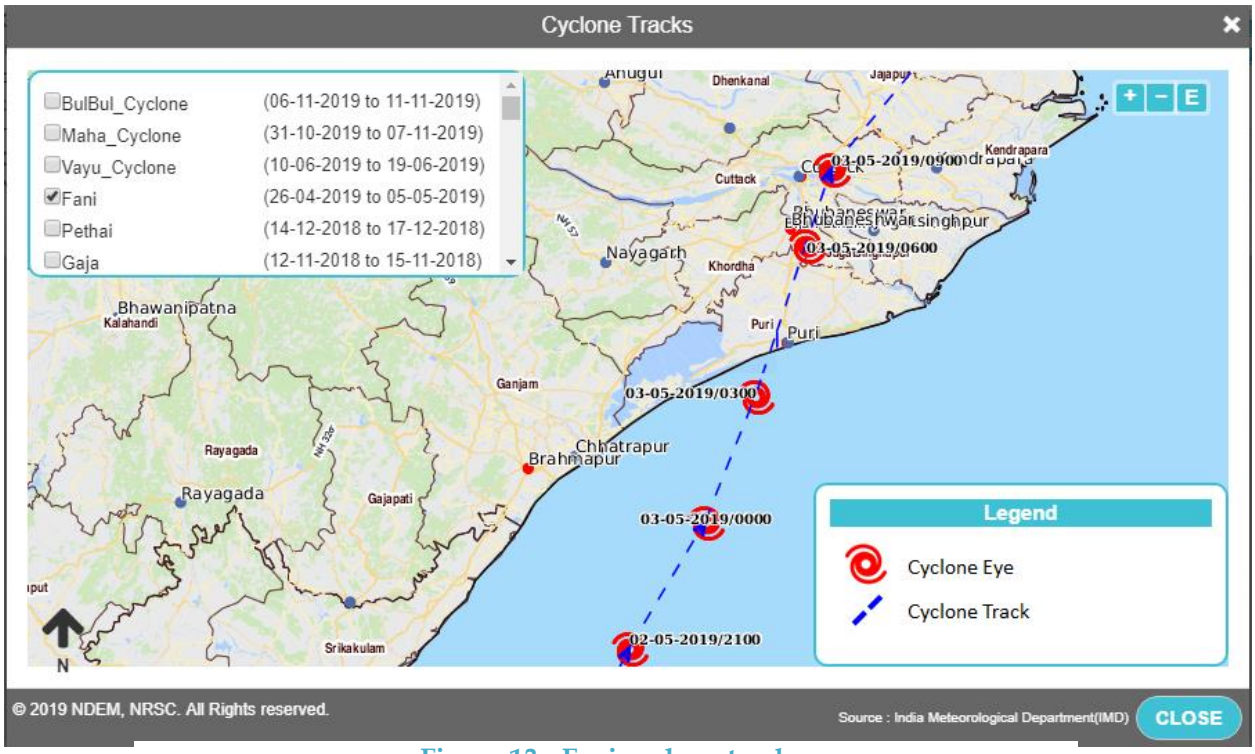


Figure 13 - Fani cyclone track

2.4.8. Weather Forecast

☞ Click on **Weather Forecast** tab on disaster dashboard

It displays the all India weather summary and forecast bulletins in pdf format which is releases by IMD thrice in a day. This report contains analysis of previously forecasted data, and next 5 days rainfall and temperature forecasts, including weather warning.

2.4.9. Weather Warnings

☞	Click on **Weather Warnings** tab on disaster dashboard

It displays the all India weather warning bulletin releases by IMD thrice in a day. It includes Five days forecast for entire country. The warnings include heavy rain, heavy snow, thunderstorm, dust storm, strong winds, visibility, cyclone, squall/hail, frost, cold wave, heat wave, and sea state etc.

2.4.10. Lightning Data

☞	Click on the **Lightning** tab on disaster dashboard

A window appears (Figure 14): it is a near real time tracking of Lightning over India. User can visualize the Lightning spots occurred in Last 30mins, 20mins & 10mins. The data refreshes for every 10 minutes.

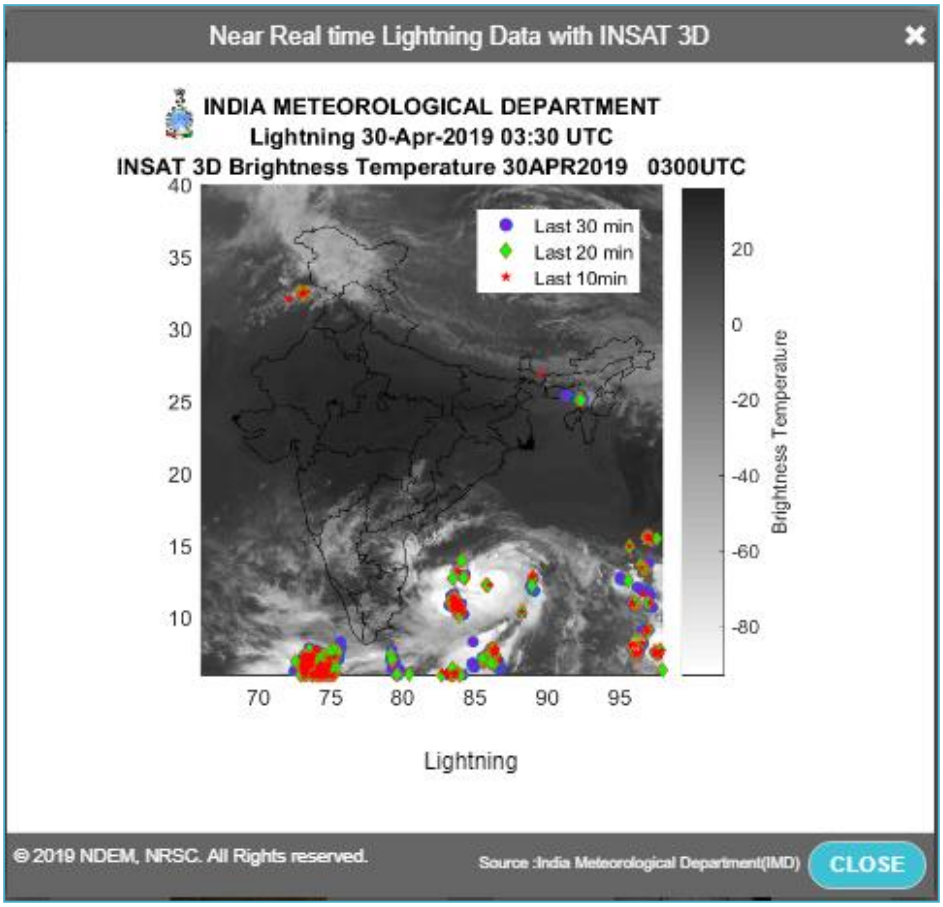


Figure 14 - Lightning occurred in Last 30 minutes

2.4.11. Thunderstorm Warnings

☞ **Click on Thunderstorm Warning tab on disaster dashboard**

A window popups as shown in the Figure 15; It gives the thunderstorm now cast for next 3hrs. Warnings are categorized into four types;

i. Moderate Thunderstorm

ii. Severe Thunderstorm

iii. Thunderstorm with Squall

iv. Thunderstorm with Hail

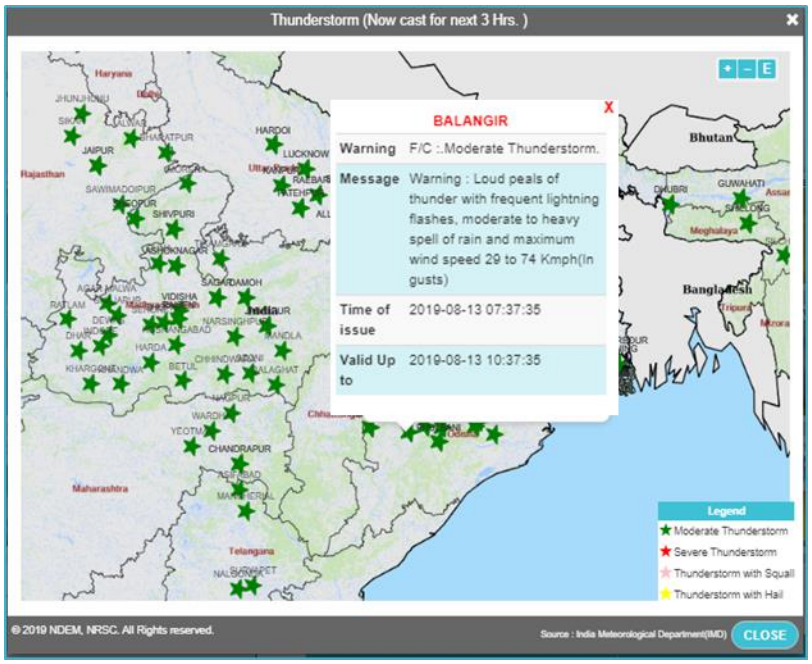


Figure 15 - Moderate Thunder Strom Warning

2.4.12. Flood Forecast

☞ Click on **Flood Forecast** tab on disaster dashboard

A window appears (Figure 16); this module shows the three days advisory flood forecast for all level and inflow gauge stations. User to select the type of gauge station and day which she/he wants to see the forecast details. Level indicates the height of the river water level at the point of gauge station, measure in meter units. Inflow indicates the flow of water into the reservoir/dam, measure in MCM units. Inflow is categorized in 5 parts based on the inflow of the water. And level is categorized into 4 parts based on the Danger level of the River. (*MCM – Million Cubic Meter)

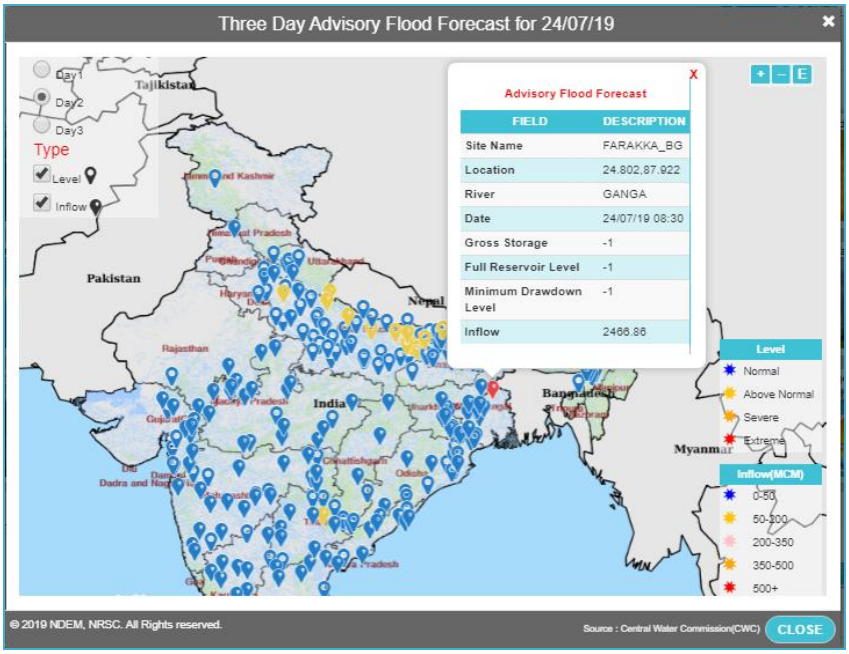


Figure 16 - Advisory Flood Forecast

2.4.13. Flood Warnings

☞	Click on **Flood Warnings** tab on disaster dashboard

A window popups as shown in the Figure 17 ; It shows the data of the gauge stations, which crossed flood warning level. Based on this level it is divided into four categories Low, Moderate, High & Unprecedented flood situation.

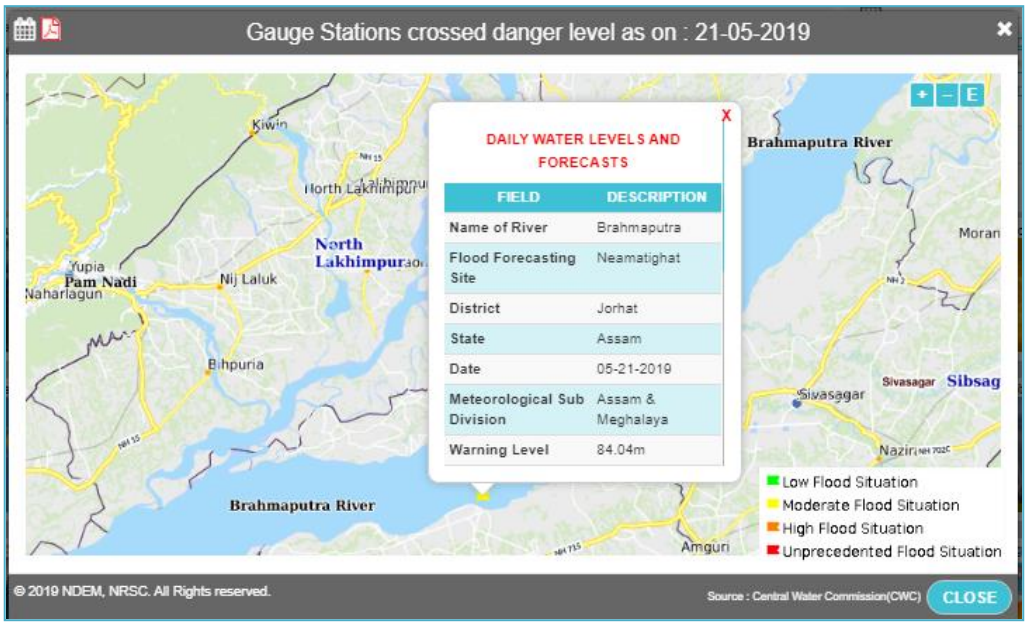


Figure 17 - Flood Warning Issued at Brahmaputra River

2.4.14. Sea State Forecast

☞ Click on **Sea State Forecast** tab on disaster dashboard

A window popups as shown in the Figure 18; It is a five day forecast of the sea state; the colour ramp indicates the significant wave height of the ocean tides and the arrows represent direction of the ocean currents. It updates in every 24 hours.

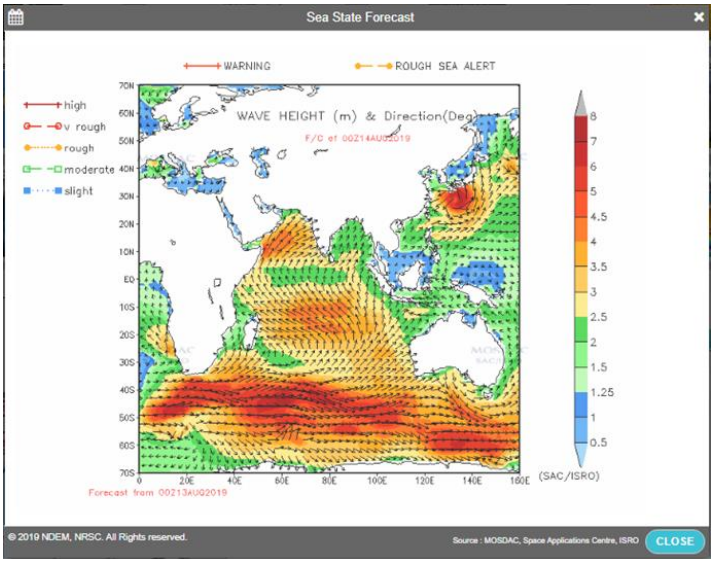


Figure 18 - Ocean waves height and direction

2.4.15. Forest Fire Locations

☞ Click on **Forest Fire Locations** tab on disaster dashboard

A window popups as shown in the Figure 19; this module gives information about forest fire incidents occurred across the country in near real time. It is monitored by four satellites namely Aqua & Terra MODIS, S-NPP VIIRS 750 & 375. The data collected by using these satellites is at a resolution of 1Km maximum and 375m minimum.

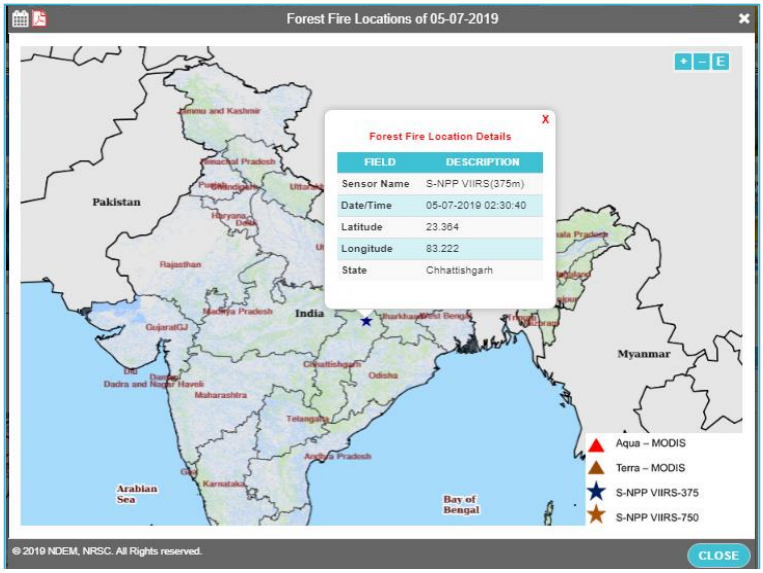


Figure 19 - Forest Fire Identified by S-NPP VIIRS-375

2.4.16. Latest Earthquake Events

☞ Click on **Latest Earthquake Events** tab on disaster dashboard

It displays the latest and recent top 10 earthquake events on a map as wells in the bottom table (Figure 20). The legend shows the details of the color significance displayed on the map. User can access past earthquake events data by selecting a date from the calendar icon. These locations are overlaid on seismic zones base layer. Use + − E for Zoom-In, Zoom-Out and Full extent of the map. By clicking on the event points user can see the time and date of the event, location and intensity of the earthquake. User can download a PDF file of the map by clicking on the icon under the product column.

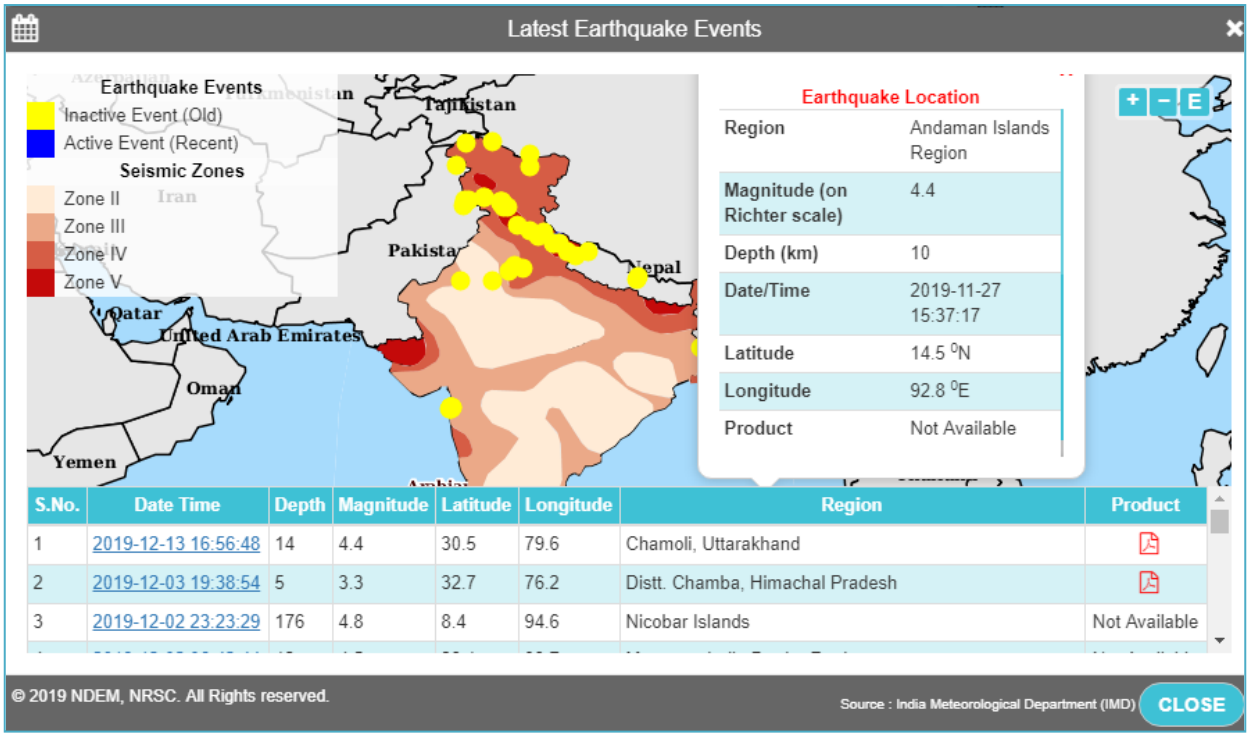


Figure 20 Latest Earthquake events

2.4.17. Storm Surge

☞ Click on **Storm Surge** tab on disaster dashboard

A popup window will appear as shown in the Figure 21; Storm surge is obtruding of the sea water by a cyclone along the coastal area. It is also known as Coastal flooding. In India most of the storm surges are caused by Cyclonic storms. The Storm surge is associated with Storm tide, Storm tide is the height of the tide above astronomical tide height. The color ramp shown in below represents the Storm tide, which is measured in Meters.

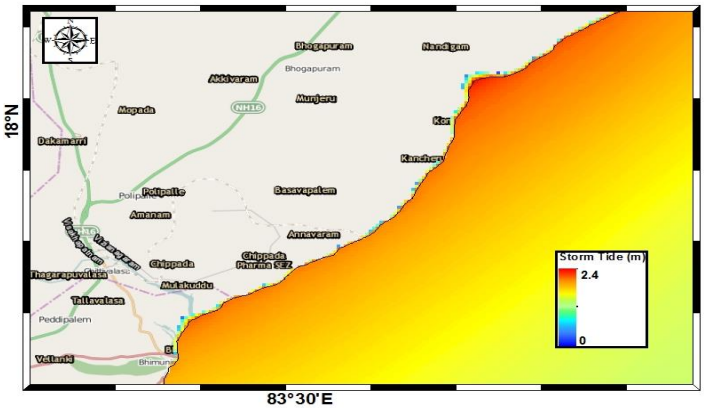


Figure 21 - Storm Tide along the Coastal Area during

2.4.18. Nowcast Heavy Rain

☞ Click on **Nowcast Heavy Rain** tab on disaster dashboard

It displays areas of the Current Heavy Rain alerts on the map for next 6 Hours (Figure 22).

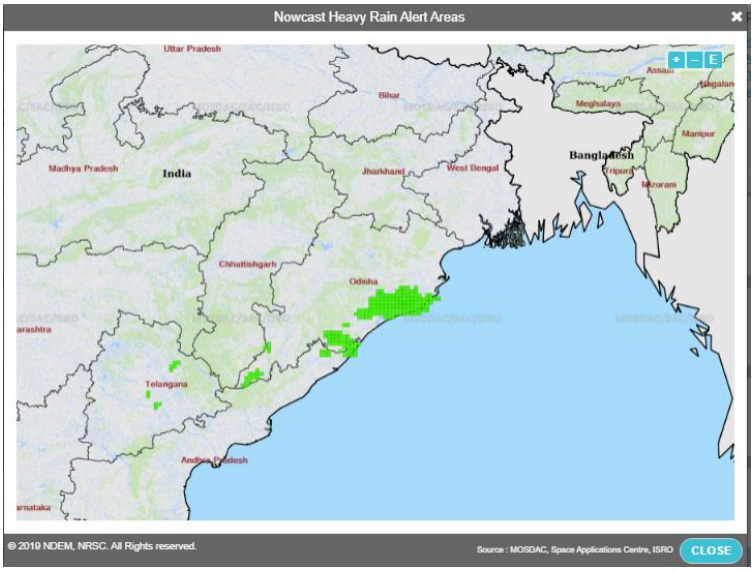


Figure 22: Nowcast Heavy Rain Alerts

2.4.19. Cloud Burst

☞ Click on **Cloud Burst** tab on disaster dashboard

It gives the Information about Cloud formation over Western Himalayan region.

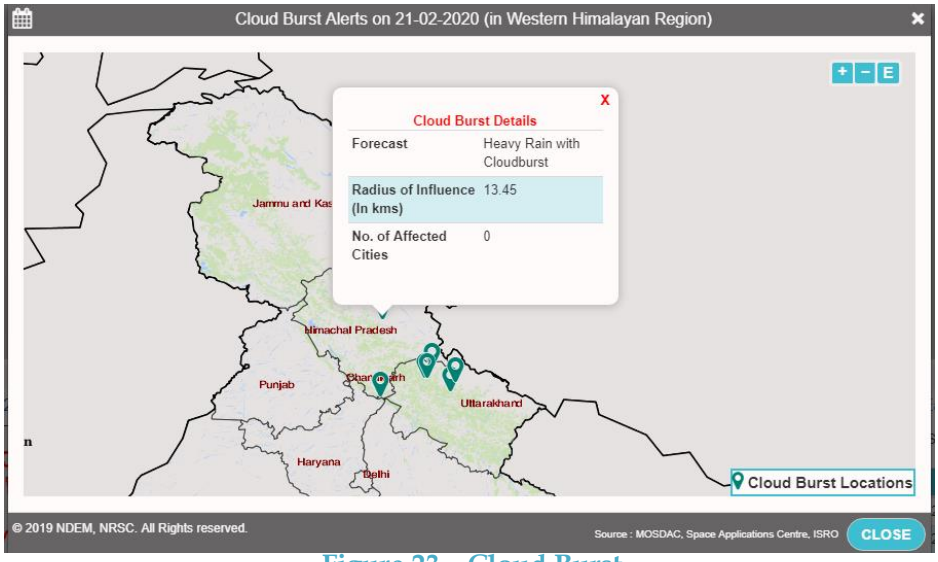


Figure 23 – Cloud Burst

2.4.20. Lightning Forecast

☞ Click on **Lightning Forecast** tab on disaster dashboard

Lightning forecast gives the information of the areas that are going to be affected by Lightning strike in next 72 hours with a period of 3 hours. These alerts are issued by MOSDAC/ISRO.

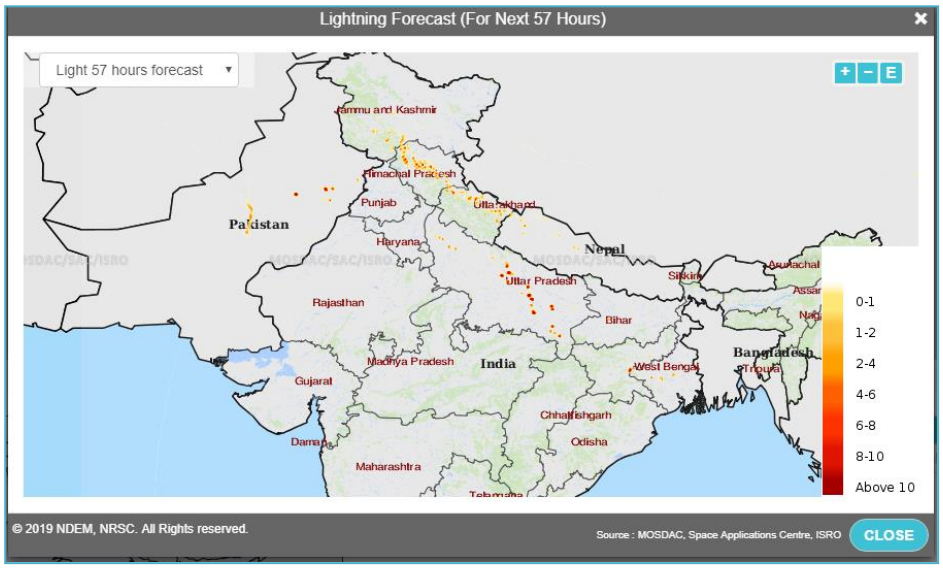


Figure 24 - Lightning Forecast

2.5. Disaster Event Card

It showcases the latest and active disaster events of the country. It provides information of the event name, start date and status of the event. When the user clicks on any event ID, the effected states are highlighted on the map, along with brief information of the event is shown in the bottom of table (Figure 24).

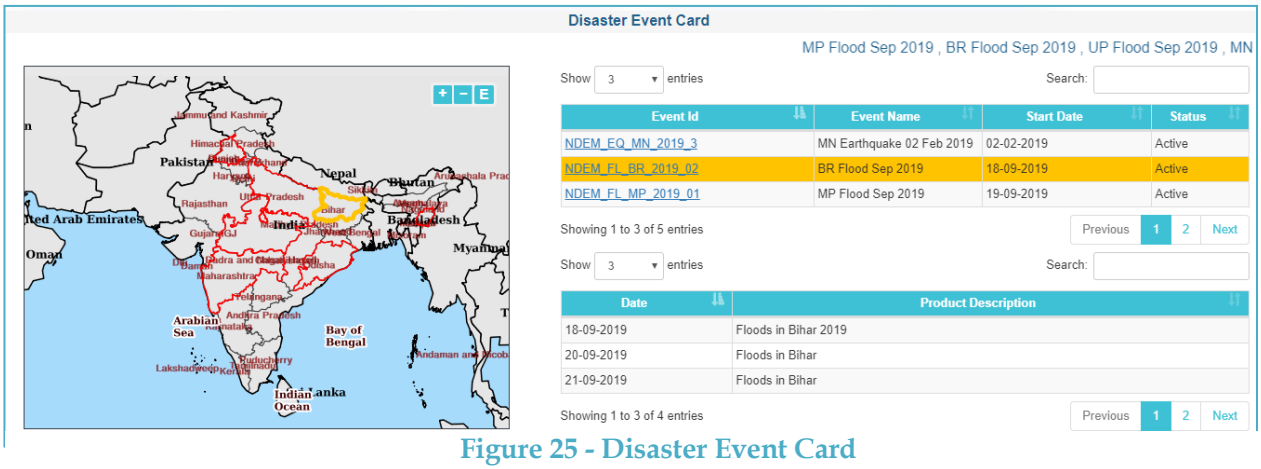


Figure 25 - Disaster Event Card

2.6. Product Updates

It displays the updated spatial and non-spatial products onto the portal along with state thumbnail of product with description of the product, primary source of product, date/time of hosting etc. (Figure 26).

Figure 26 – Scrolling of Portal Updates

2.7. Disaster Information-Social Media (tweets)

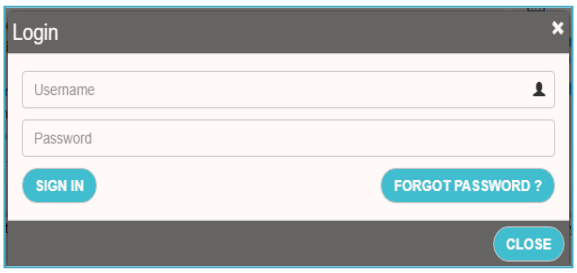
It scrolls the active/recent disaster specific tweets/social media information based on specific keywords and hash tags such as forecast, cyclone, and earthquake. User can also view the historical information by selecting date in the calendar. By browsing on tabs (Cyclone, Earthquake Flood etc.) gives the corresponding information (**Error! Reference source not found.**).

Figure 27: Scrolling of Disaster related social media information

2.8. Sign In

To access the services of NDEM V4.0 the user needs to sign into the portal by using valid authorized credentials. To log in to the NDEM portal use the user name and password given to the user. Click on the **Login** placed at top right corner, a pop-up will open enter the user name and password and click **sign in (**Figure 27**)**.

Figure 28 - Login window



! Caution – After three unsuccessful login attempts, the IP address of the user computer/mobile will be automatically locked for a period of 60 minutes. During this time the user is not allowed to log in to the portal.

2.9. Forgot Password:

To recover the password user has to click on **Forgot Password** in login page (figure 25); a window will open by asking Enter Username. On entering the username the password will be sent as SMS to the registered mobile number given in authorization form. This SMS contains a password. Change this password after logging in by opening the state profile.

2.10. Submission of feedback

User can submit **feedback/suggestion** on NDEM portal in different ways, one of the ways is to submit feedback through the online feedback form available at bottom of the home page (Figure 28).

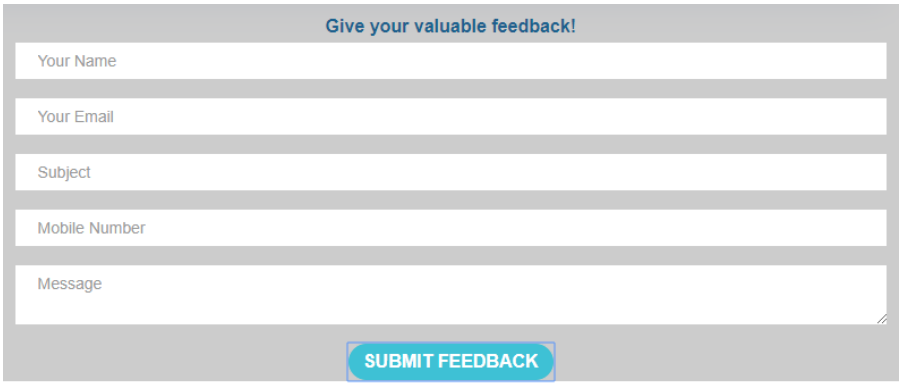


Figure 29 – Online Feedback form

2.11. Important links

User can download the following digital documents provided links under this tab

- User Authorization form
- User manual
- Brochure
- Flyer

2.12. Download Mobile Apps

Users can download the following .apk files for android based Mobile Phones

- NDEM Mobile
- Relief Management

The NDEM mobile is a lighter version of NDEM portal; packed with few essential geo-spatial layers and DSS tools. The App also hosts the disaster dashboard.

The Relief Management App consists of integrated modules for i) Incident reporting ii) Relief management iii) Geo-spatial data collection iv) Geo-tagging of emergency facilities.

3. Inside View (After successful login):

As per the MHA guidelines NDEM services are disseminated to various departments in the country for effective disaster management. These departments include i) Central Departments covering monitoring nodes such as PMO, NDMA, MHA; ii) Forecasting Departments such as IMD, CWC, INCOIS, iii)Relief & Rescue agencies such as NDRF, SDRF iv) Relief Commissioners of the States/UTS v) District Collectors across the country. The list of authorized Portal users is classified into three categories.

1. Central Level Users – access is enabled for entire country (State wise)
2. State Level Users – access is enabled for respective State
3. District Level Users – access is enabled for respective District and State

- On a Successful login a central level user will be redirected to dashboard of state as shown in Figure 30. By **clicking** on any State the user will be redirected to corresponding State viewer
- To get back to the States dashboard click on **State Pages**

button situated at right side.

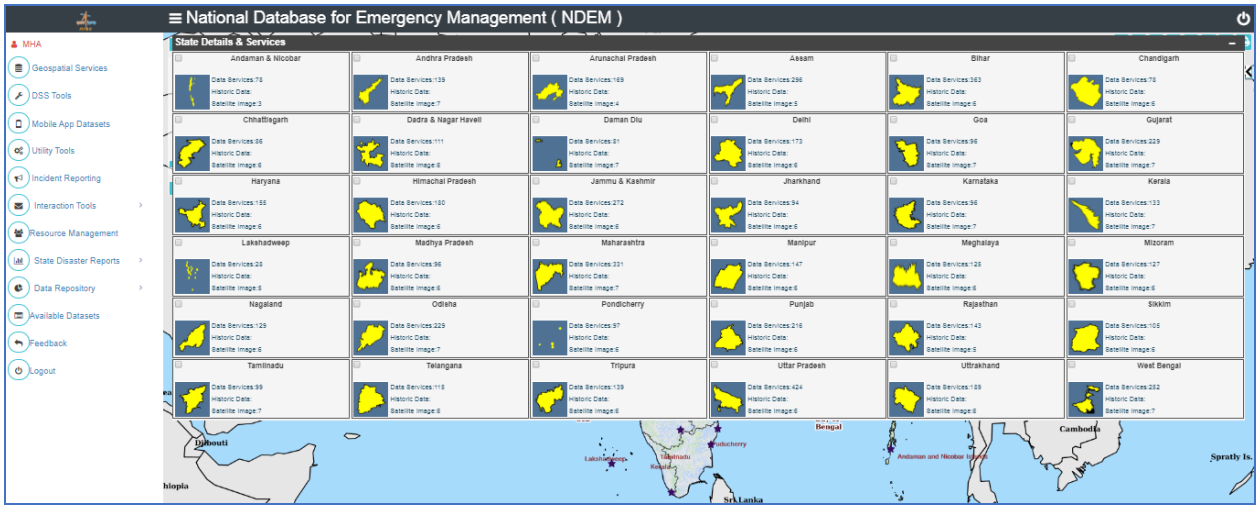


Figure 30 - States Dashboard

- On a Successful login a State level user will be redirected corresponding State portal as shown in **Error! Reference source not found.**.

- On successful login to the district level user will be redirected to the map view of the corresponding district.

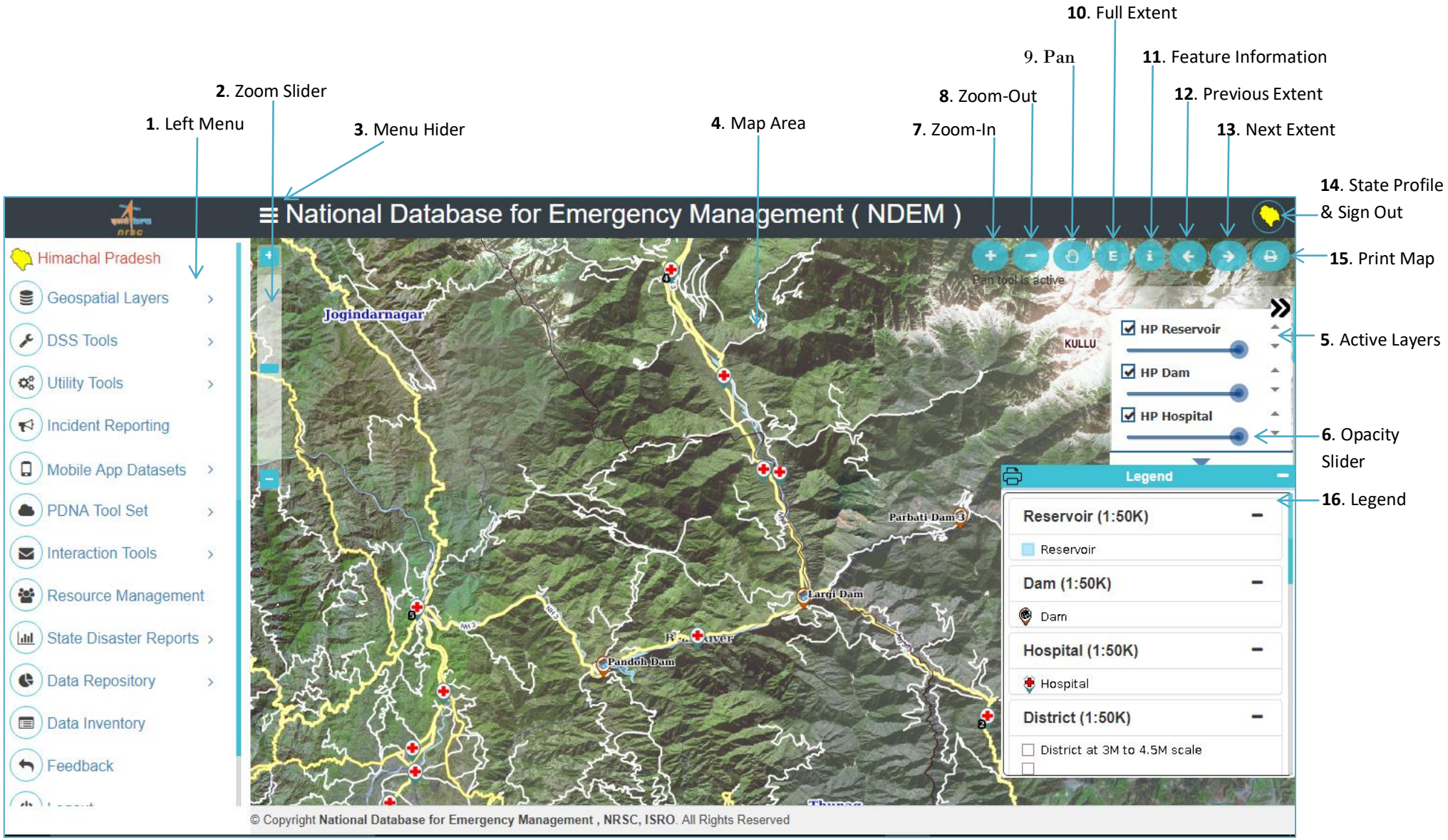


Figure 31 - Inside view of a NDEM portal- State Login

❖ **Tools & Windows**

1. **Left Menu** – The Table of contents hosts the entire spatial and non-spatial datasets in different categories
2. **Zoom Scroll Bar** – Indicates the level of the zoom in a bar format. Use scroll wheel on the mouse or use the + − buttons on the zoom bar for Zoom-In and Zoom-Out.
3. **Menu Hider** – Hides or Opens the menu on left hand side.
4. **Map Area** – The data selected in Left menu will be overlaid here.
5. **Active Layers** – The layers that are selected in menu are shown here. Mark the checkbox to view the data. And use ▲▼ symbol to change the order of the layer by dragging Up and Down.
6. **Opacity Slider** – Change opacity of a layer by sliding on the bar.
7. **Zoom-In** – Select the tool and draw a box on the map where to zoom in.
8. **Zoom-Out** – Select the tool and draw a box on the map for zoom out.
9. **Pan** – Select this tool to move the map
10. **Full Extent** – Click on this tool to go back to the full extent of the State admin boundary.
11. **Feature Information** – Click on this tool and then click on any layer on the map to know display the attribute information of the clicked feature.
12. **Previous Extent** – Select this tool to go back to the previous extents of the map.
13. **Next Extent** – Select this tool to move to the next extents of the map.
14. **State Profile & Sign out** – Profile of logged-in user.
15. **Print Map** – Click on this tool to print current view of the map.
16. **Legend** – Shows the symbology information of added layers.

3.1. State Profile:

☞ Click on **state profile** button

- User can sign out/log out by clicking on the **SIGN OUT** button.
- User can view the details of the authorized official and can change the password by clicking on the **PROFILE** button, a form will popups; Fill the form with required details and click **UPDATE PROFILE** button (figure 30).

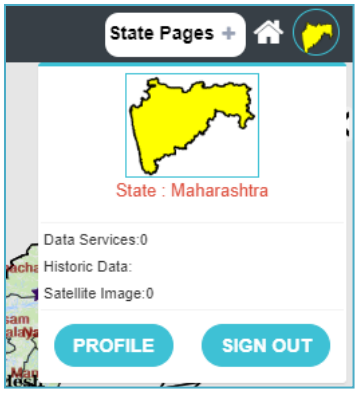


Figure 32- User Profile

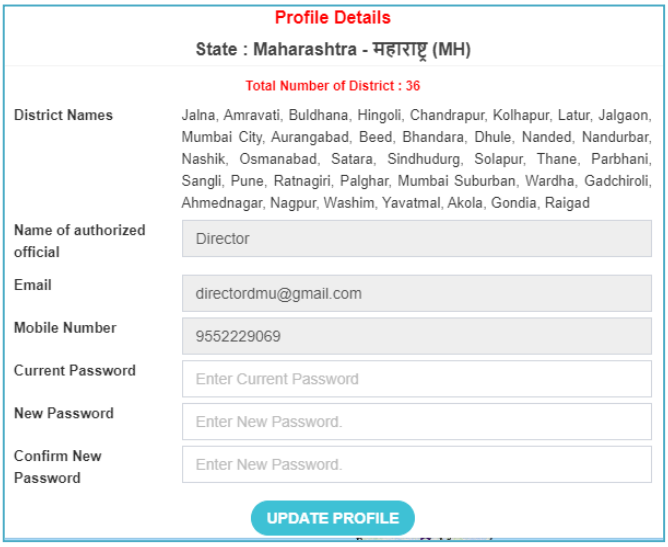


Figure 33 – Profile details Updation form

3.2. Geospatial Layers

Geospatial layers tab contains multi-scale spatial & Non-spatial data with essential database elements for addressing emergency management. The spatial data is segregated into data preparation scale wise for visualization on the map widow. User can access the vector datasets, satellite imagery including high resolution data along with disaster specific data.

Figure 34 - Catalog of Geospatial Layers

3.2.1. 1:50,000 Scale

At 1:50,000 scale a comprehensive database with essential database elements for addressing disaster/emergency management has been listed below..

In 1:50,000 scale for ease of accessing and understanding, layers are further classified as

- Base Layers
- Thematic
- Infrastructure
- Point of Interests (POIs) data

3.2.1.1. Base Layers

Follow these steps to add Base layers data on the map (Figure 33),

> ☞ Click Geospatial layers > 1:50,000 > Base Layers > select one or more options

- User can view the Meta data by clicking on icon.
- User can print the metadata by using icon on Metadata window.

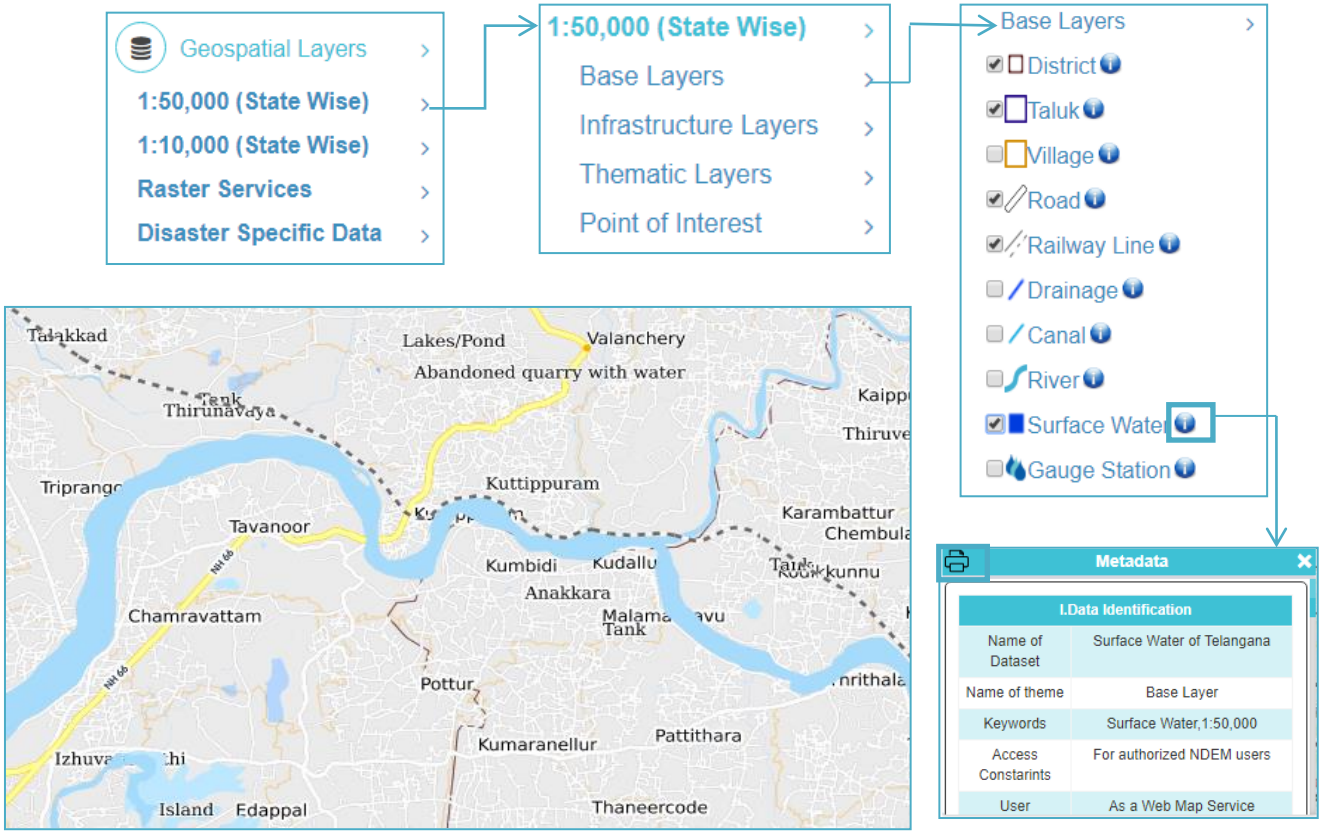


Figure 35 –Adding of base layers to the map

Note: Users can select multiple layers through check box; the selected layers are visualized and integrated in single map viewer with the order of display

3.2.1.2. Thematic Layers

☞ Click 1:50,000 > Thematic Layers > select one or more choices (ex: LULC/Forest Area/Hydrology)

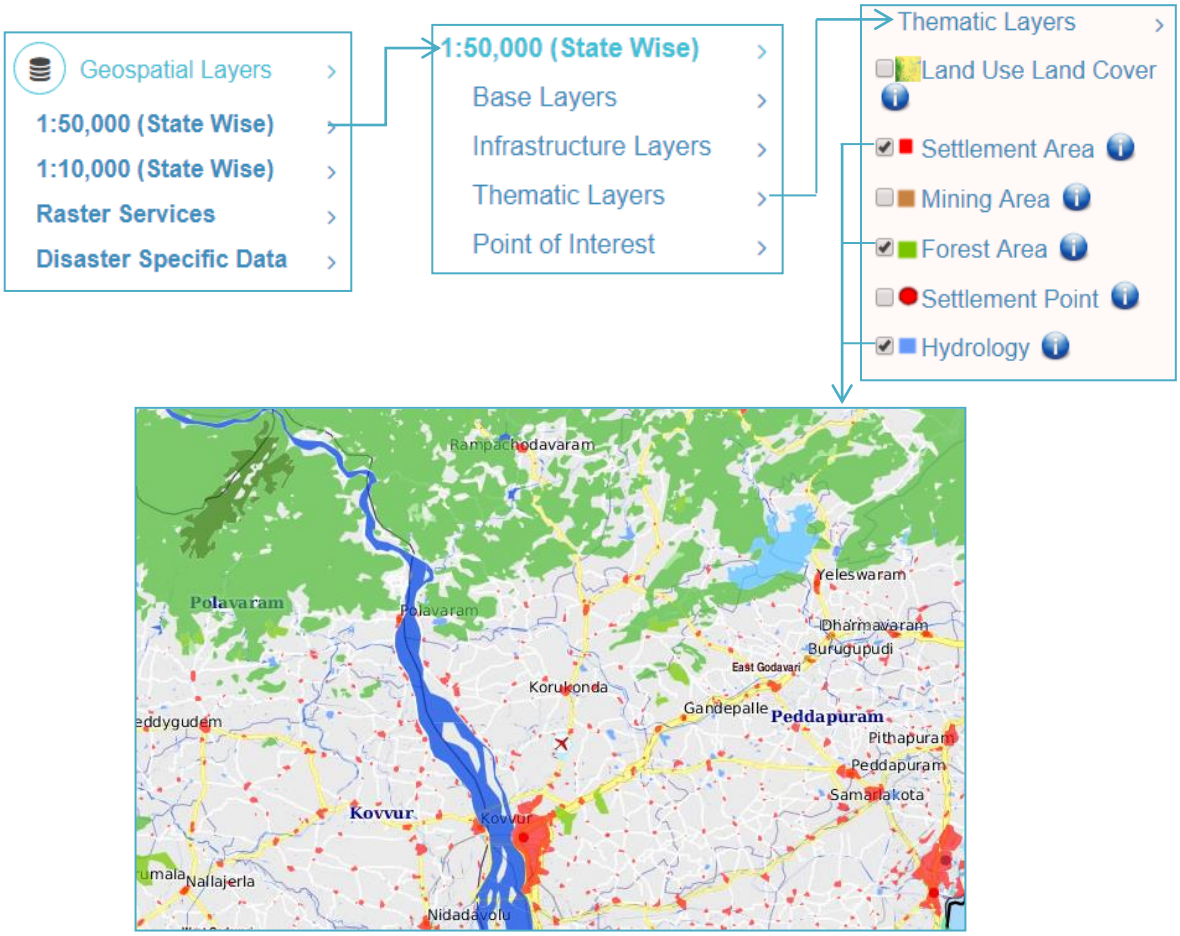
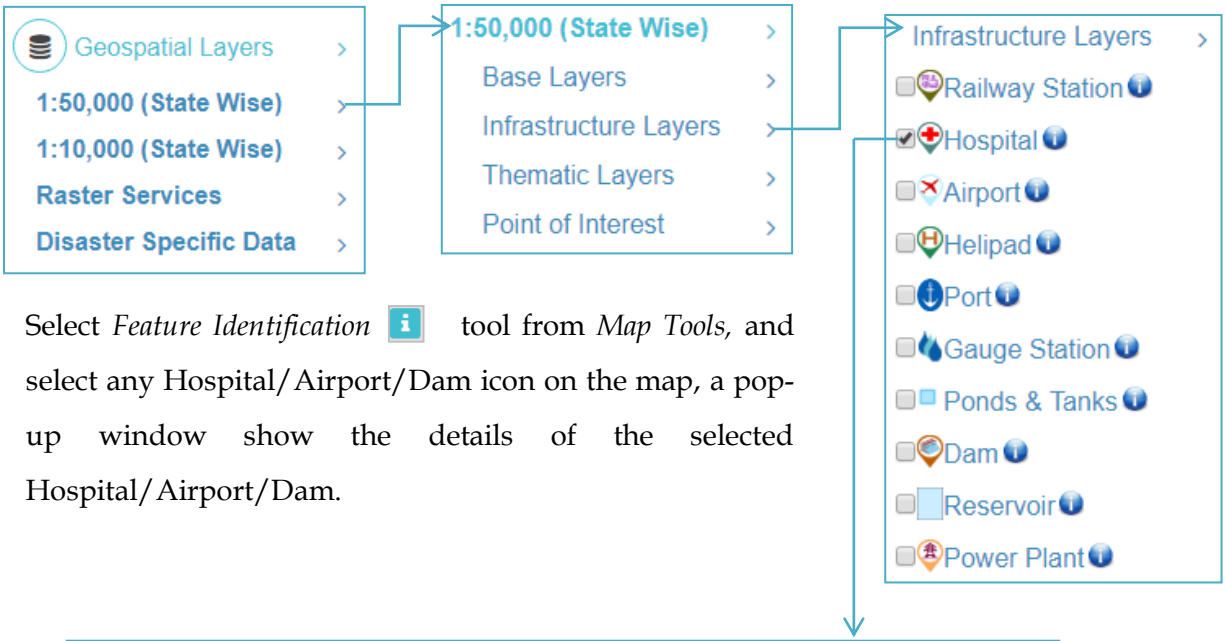


Figure 36 – Adding of thematic services to the map

3.2.1.3. Infrastructure Layers

> ☞ Click Geospatial layers > 1:50,000>Infrastructure Layers > Hospital or Airport or Dam..



Select *Feature Identification* tool from *Map Tools,* and select any Hospital/Airport/Dam icon on the map, a pop-up window show the details of the selected Hospital/Airport/Dam.

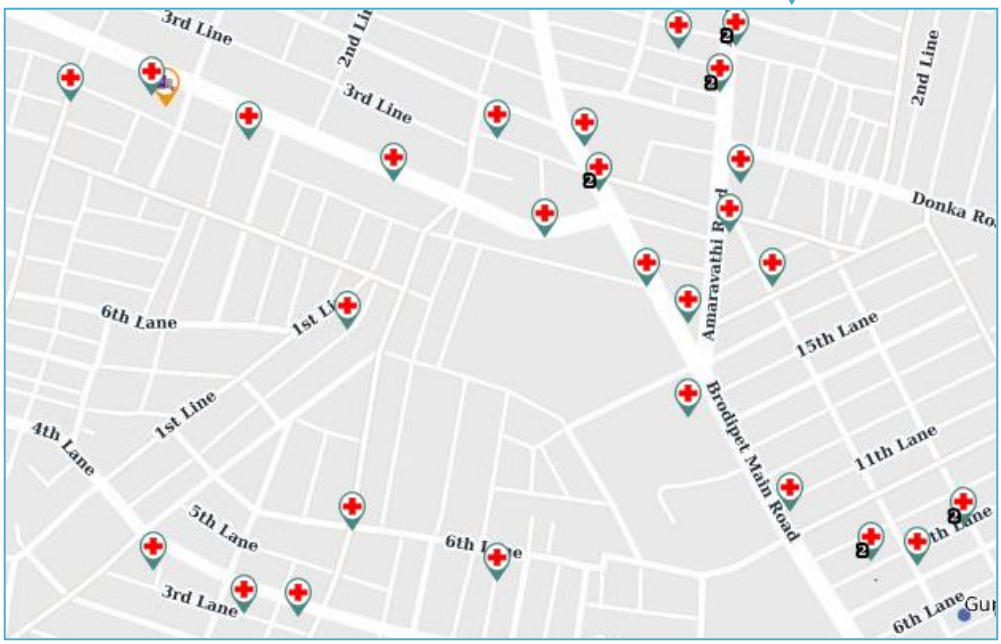


Figure 37 – Adding infrastructure layers to the map

3.2.1.4. Point of Interest (POI) Data sets

NDEM database is integrated with nearly 10 million points of interest (poi) data includes vital installations, commercial centers, Medical facilities, schools, Infrastructure locations for relief and rescue in disaster management. For ease of access and visualization total data sets are categorized into 10 main categories and father 40 sub categories.

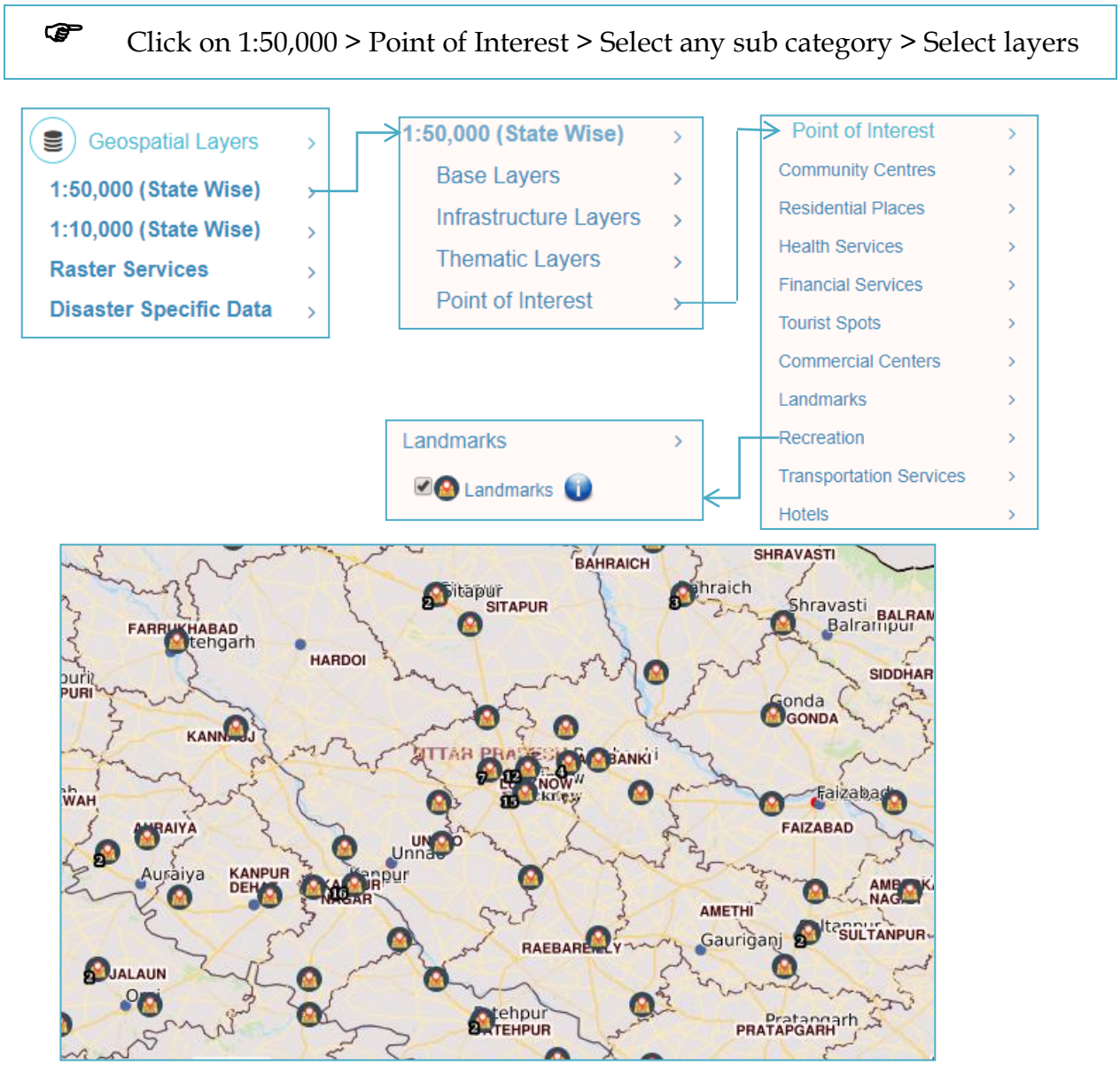


Figure 38 - POI Landmarks

Feature Identification tool is useful to identify the feature that are being added to the base layer. To identify any feature on the map; Click on the feature identification tool from

the map tools bar, then click on any feature on the map. A pop-up will open by displaying attribute data of that feature.

3.2.2. 1:10,000 scale

The database at 10,000 scale is organized for 350 Multi hazard prone districts along with base, thematic, infrastructure with finer details. To add **1:10,000 Scale** data on to the Map view follow the steps:

☞ Click Geospatial Layers >1:10,000 > Select Layers

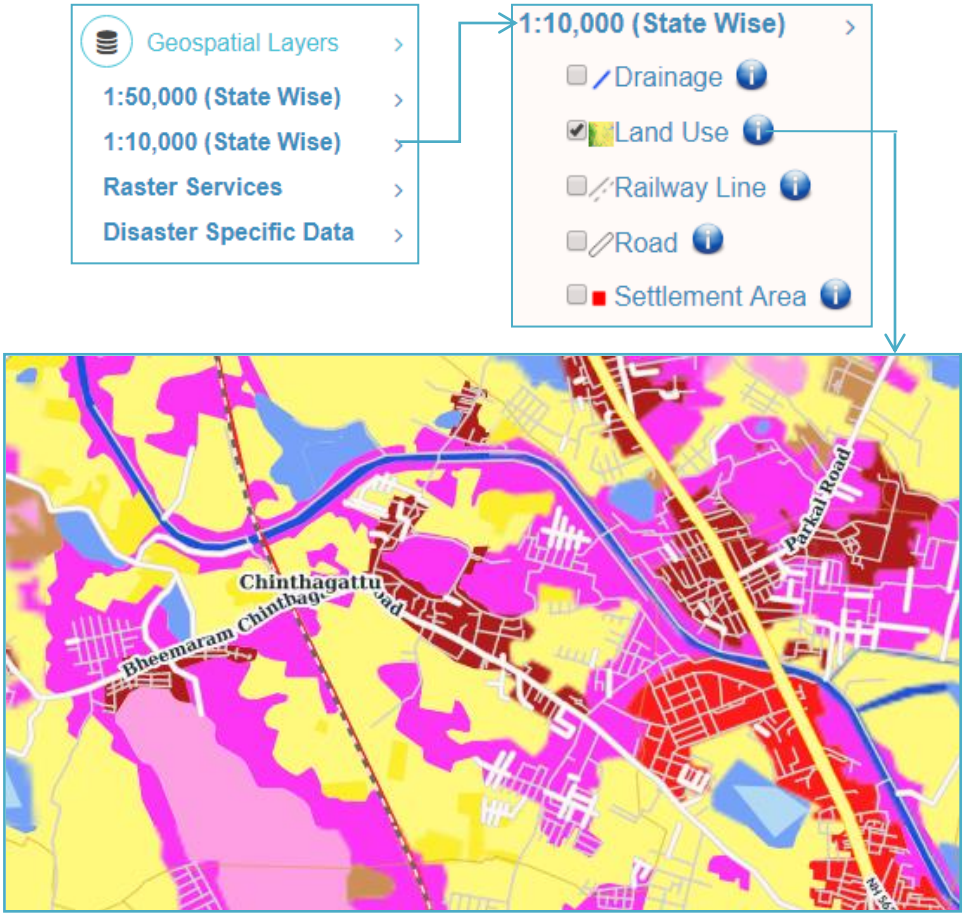


Figure 39 - Land Use & Land Cover at 1:10,000 Scale

On successful addition of layer, observe the map with finer details of Land Use & Land Cover (LULC) as shown in the Figure 37.

3.2.3. Raster Services

Users can access satellite imagery ranging from 5.8 meter resolution to sub-meter resolution by clicking on **Raster Services**, It comprised of Cartosat-1,2 and LISSIV-MX, Digital Elevation Models (DEM) and High Resolution (HR) data sets.

- To visualize satellite imagery on the map, select any one satellite product from the Raster services menu (Figure 38).

☞ Click Geospatial Layers > Raster Services > LISS-IV & C-1 2.5m

Figure 40 – Visualization of satellite imagery data

- User can detect the changes between base layer and a raster layer, by using 👆 'swipe tool' next to the selected raster layer (Figure 39).

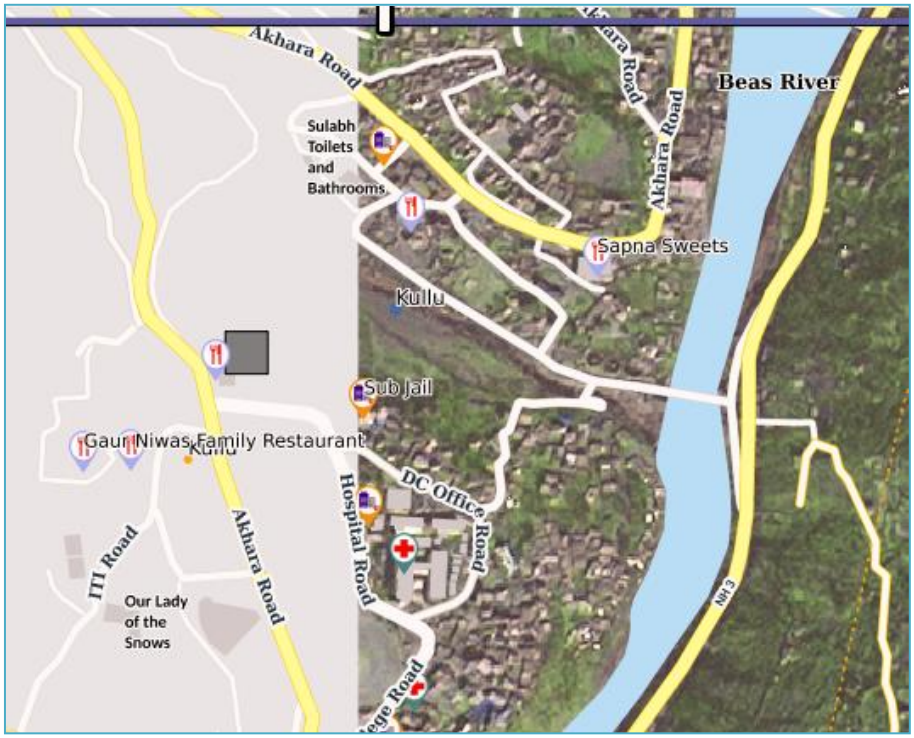


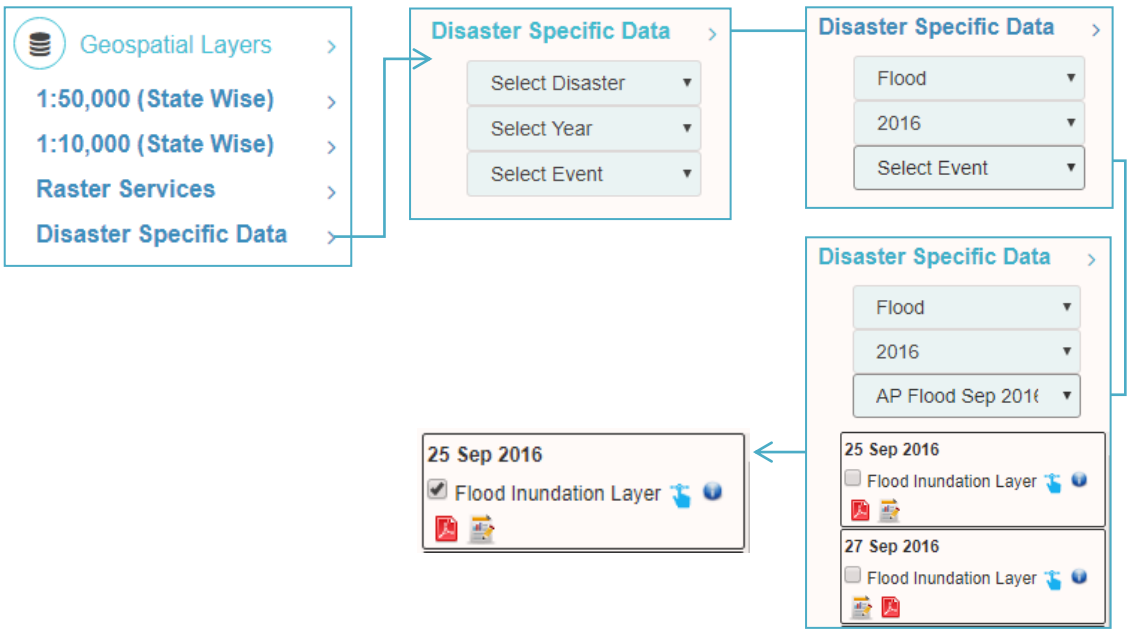
Figure 41 - Swipe Tool to analyze the differences between two layers

3.1.1 Disaster Specific Data

Disaster specific information is required to handle a particular disaster situation like flood, cyclone, forest fire, earth quake, land slide, drought. The vector database needs to be complemented with required resolution satellite imagery for visualization and analysis in disaster management. NDEM contains all natural disaster specific data from 1999 onwards to till date. For ease of access in portal disaster specific data organized in drop down list with year wise and event wise.

- To access historical disasters data sets, follow these simple steps (Figure 40):

☞ Geospatial layers > Disaster specific data > Select disaster > Select year > Select event > Select Layers



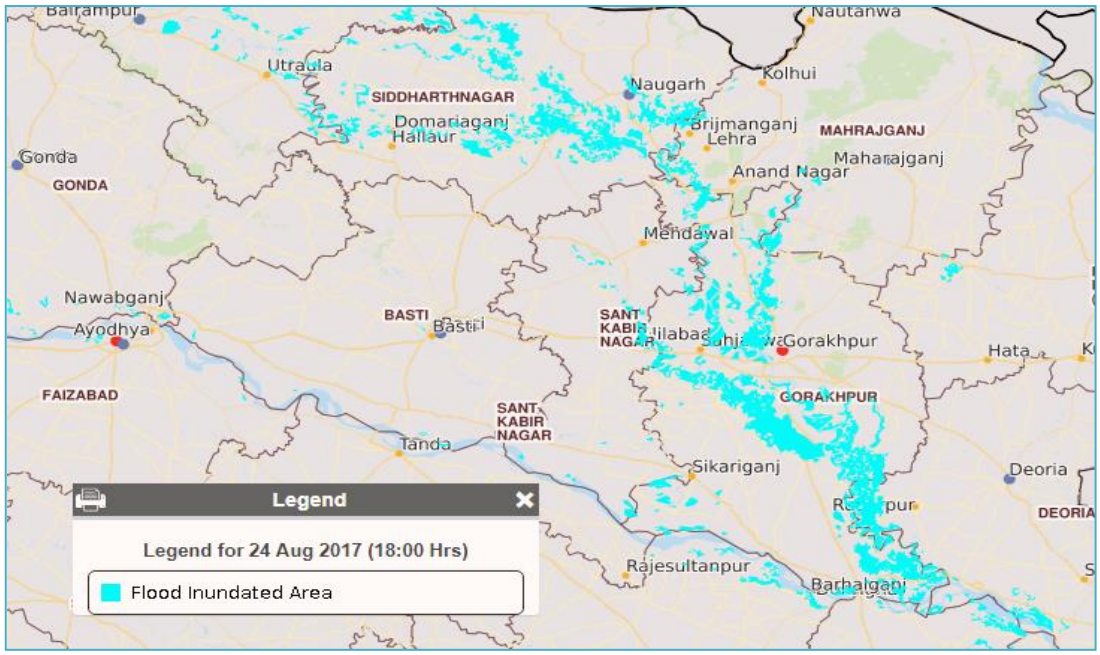


Figure 42 – Showcasing Flood Inundated Area

- User can also view and download the reports and maps for corresponding disasters by clicking on the icons placed at left to the layer

3.3. DSS Tools

Data alone is not only sufficient for decision making; In addition to data powerful tools and processes are required to optimal use of the data in disaster management. For this, NDEM

GUI based Decision Support System (DSS) tools for generating decision supporting functions. These tools include;

I. **Evacuation Plan-** Generating the risk zones and finding best relief shelters
II. **Proximity-** finding the facilities around a point with in specified distance
III. **Route Analysis-**finding route between disaster incident(source) and emergency facilities like hospital, relief shelter (destination)
IV. **Multilayer Analysis-** analysis of disaster specific layers with base layers.
V. **Spatial Query Builder**- querying of a spatial layers

3.3.1. Evacuation Plan

Evacuation plan is the one of the important DSS tools which aids the disaster managers to identify

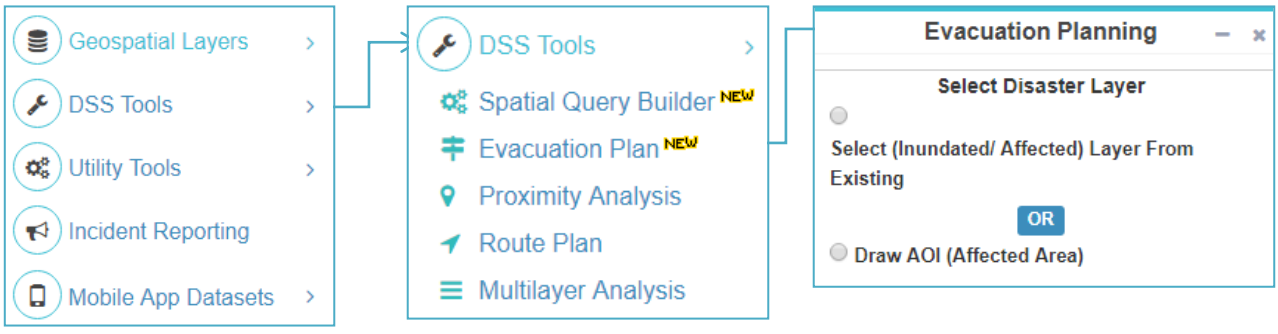
(i) Extent of area for evacuating people under specific disaster condition,

(ii) The list of villages

(iii) The list of Relief Shelters

The evacuation tool provides effected villages to be evacuated along with identification of suitable relief shelters for facilitating rehabilitation measures.

Evacuation planning can be done for Flood inundated areas separately. On execution of this tool it generates risk zone map. These risk zones are divided into 3 categories mainly High, Moderate & Low risk zones with default buffer zones 5, 10 & 15 respectively, which can be changed manually by the user. Further, it generates top 10 nearby best relief shelters for a selected a village. These relief shelters are prioritized based on its altitude, far away from risk zone, nearer to hospital, travel time etc.



➢ Computing evacuation plan for Flood/Heavy Rains Inundation Layers

☞ Click DSS Tools > Evacuation Plan > *go to* Evacuation planning window > Inundation Layers > Select Disaster Layer > Select Zone Ranges > *click* Generate Risk Zones > *click* Identify Relief Shelters > Select village on map / Choose from drop down menu > *click* Find Relief Shelters >

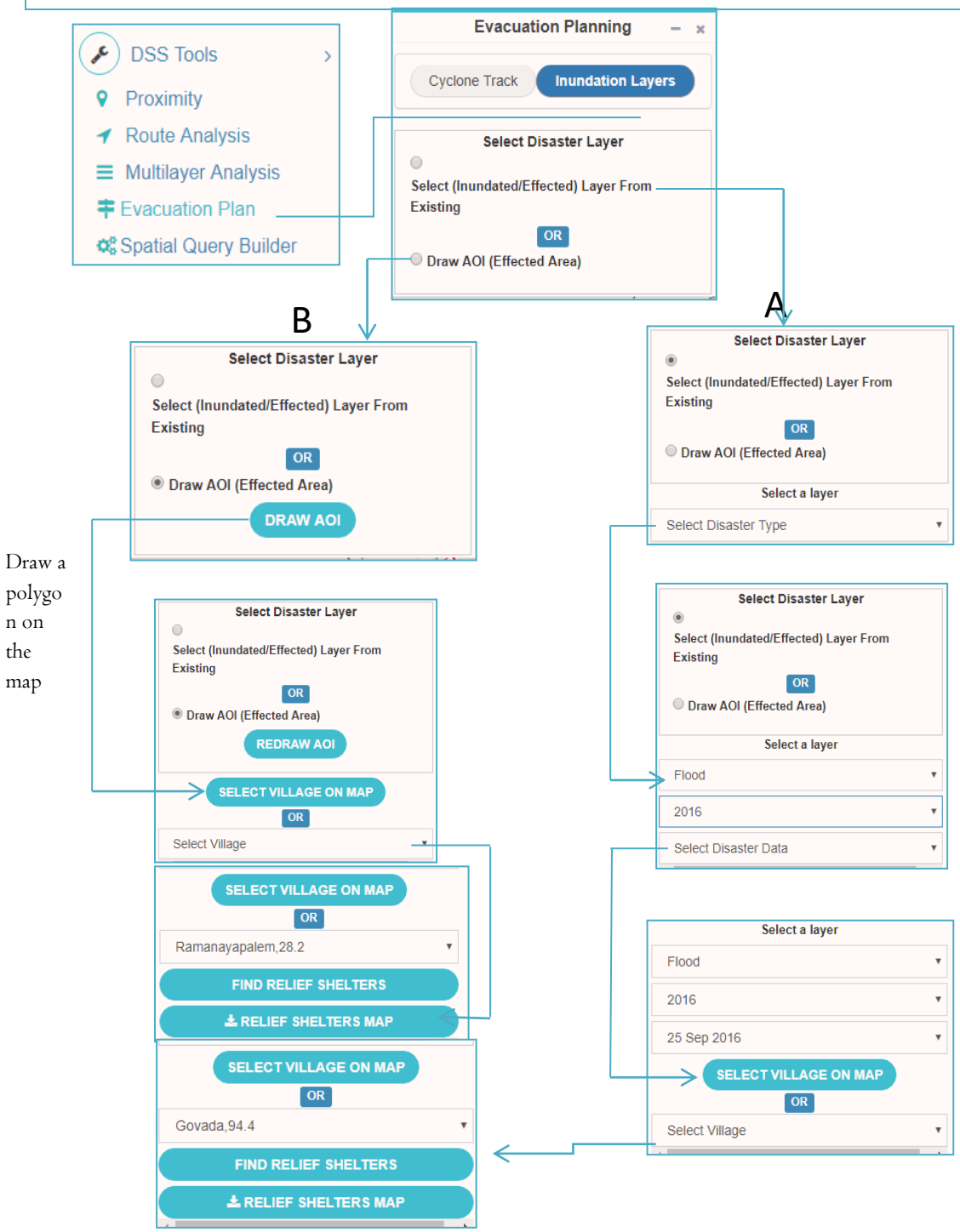


Figure 43: GUI of Evacuation Plan for Inundated area

- Evacuation plan for Inundation layers can be done in two ways; one is by selecting a disaster layer and second is by drawing a polygon for Area of Interest from the selected layer.

☞ Click DSS Tools > Evacuation Plan > *go to* Evacuation planning window > *click* Inundation Layers

A. *Mark* Select Layer from Existing > Select Disaster Layer > Select Village > Find Relief Shelters

B. *Mark* Draw AOI > *Select* Draw AOI > Draw a Polygon on the map > Select Village > Find Relief Shelters

A

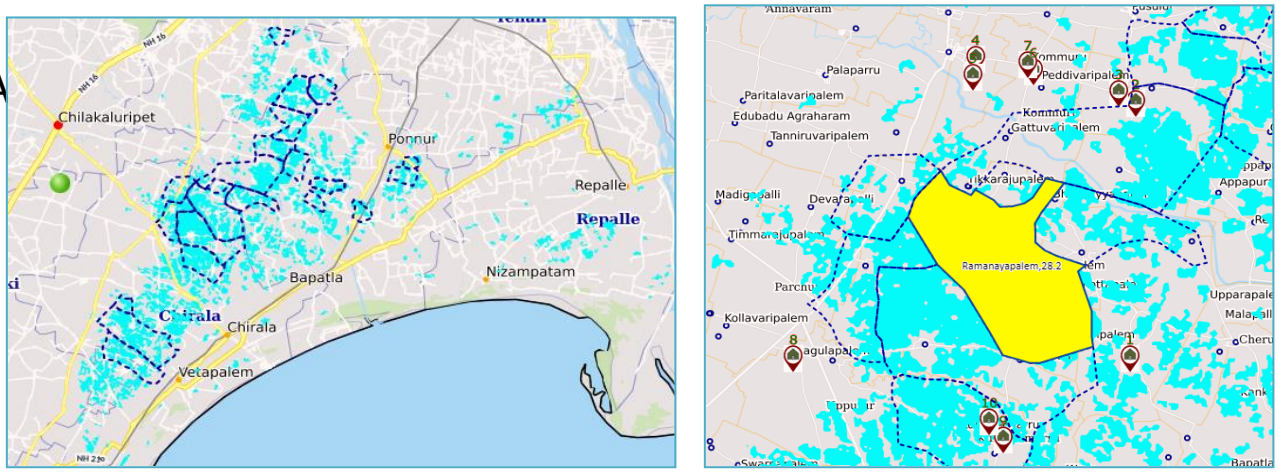


Figure 44 - Evacuation plan for Flood Inundated Area

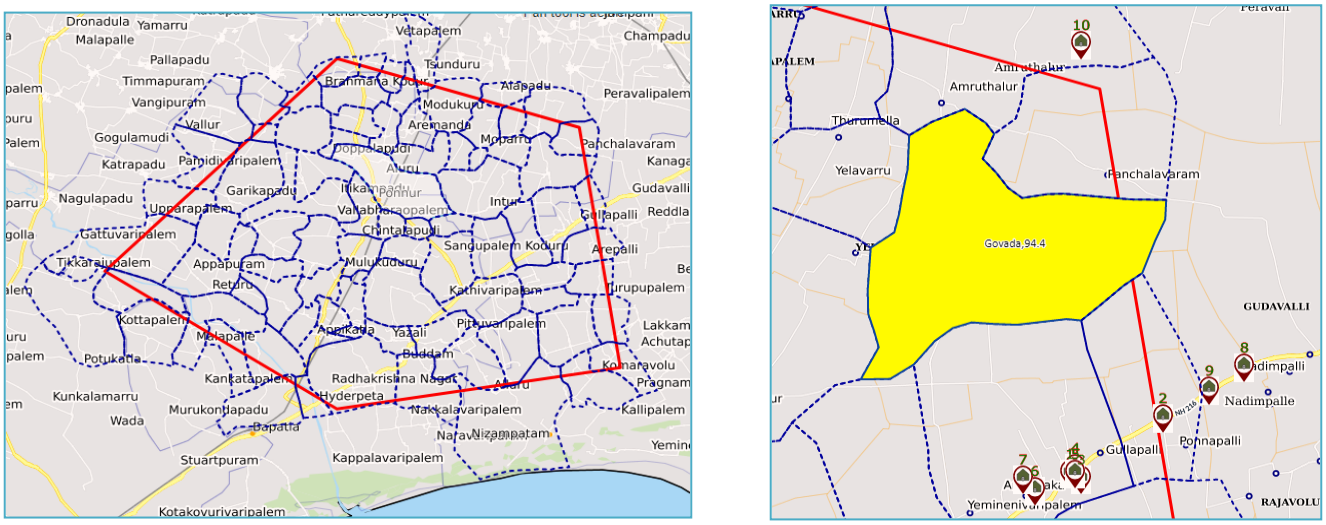


Figure 45 - Evacuation plan for an area of interest (AOI)

Deliverables of Evacuations plan:

After successful running of evacuation plan tool, a user can down load the following products/reports

I. Risk Area Map (for cyclone tracks input)

II. List of affected villages Map(for both cyclone track and inundation inputs)

III. List of best relief shelters for any selected village

3.3.2. Proximity

This tool is used to identify the facilities in a buffer zone around a selected point with in specified distance (ex: 5Km, 20Km, 50Km etc.)

☞ Click DSS Tools > Proximity > Facilities within proximity

In the '**Facilities within Proximity**' window, User can select any point on the map canvas or can enter Latitude-Longitude manually. And select '**Buffer Distance**' *(*in Kms*)*, then choose '**facility**' in the drop down window.

☞ Select/Latitude-Longitude > Buffer Distance > Facility > Sub-category > Find facility

User can take the print copy of proximity results; it contains the details of the facility and distance (in Kms) from selected point (Figure 47).

Follow these steps to identify a facility within a defined proximity;

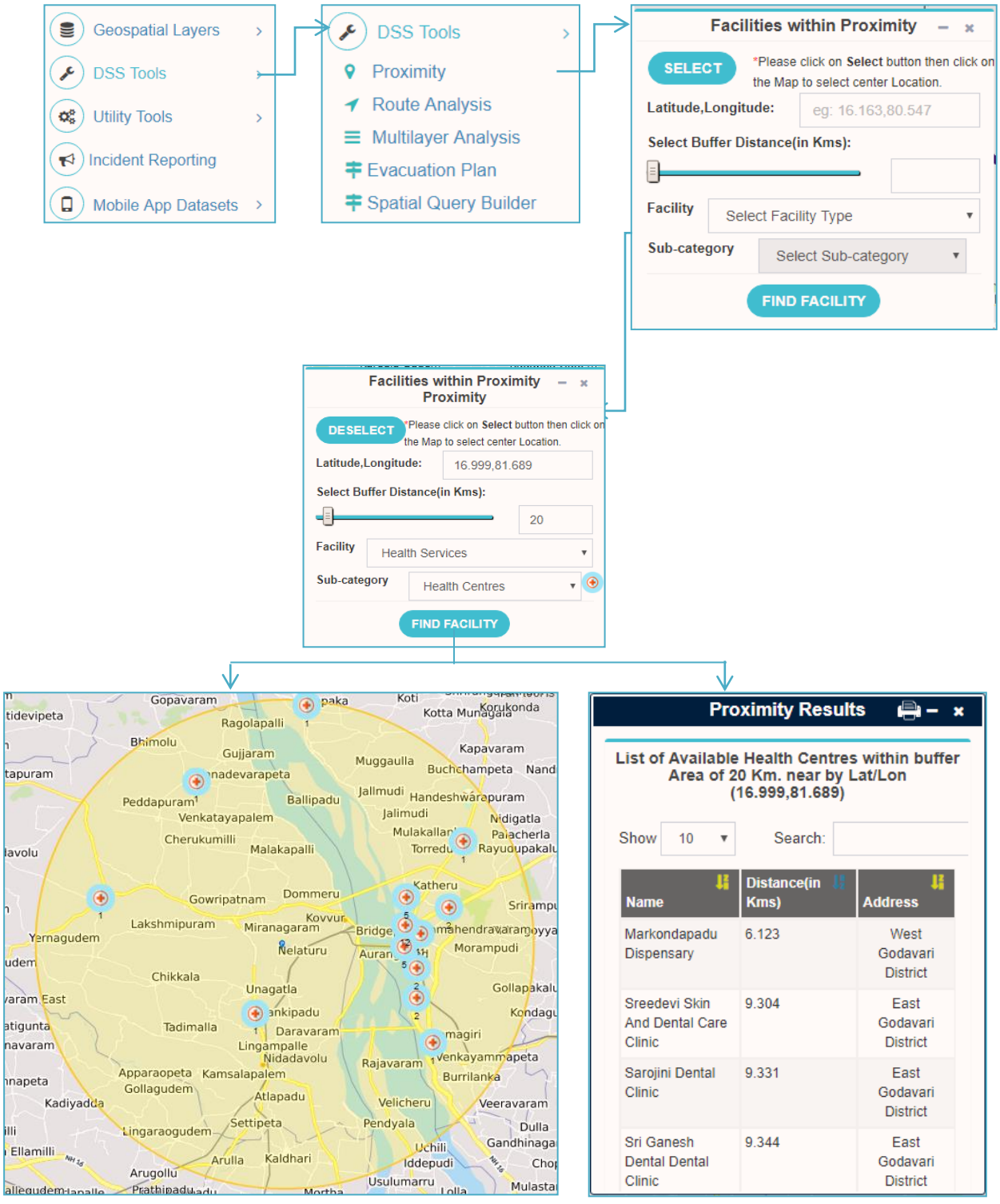


Figure 46 – Proximity Analysis: Health Centers in 20Km Buffer Zone

3.3.3. Route Analysis

In NDEM Portal optimal path between a source and destination is done in two ways,

1. **Shortest route by Time**
2. **Shortest route by Distance**

User can select Source Location and Destination Location by using **SELECT** button in the Optimal Route Finding Tool window or type names of the locations inside the search box.

> ☞ Click DSS Tools > Route Analysis > Optimal Route Finding Tool window > SELECT Source & Destination > Find Shortest Route

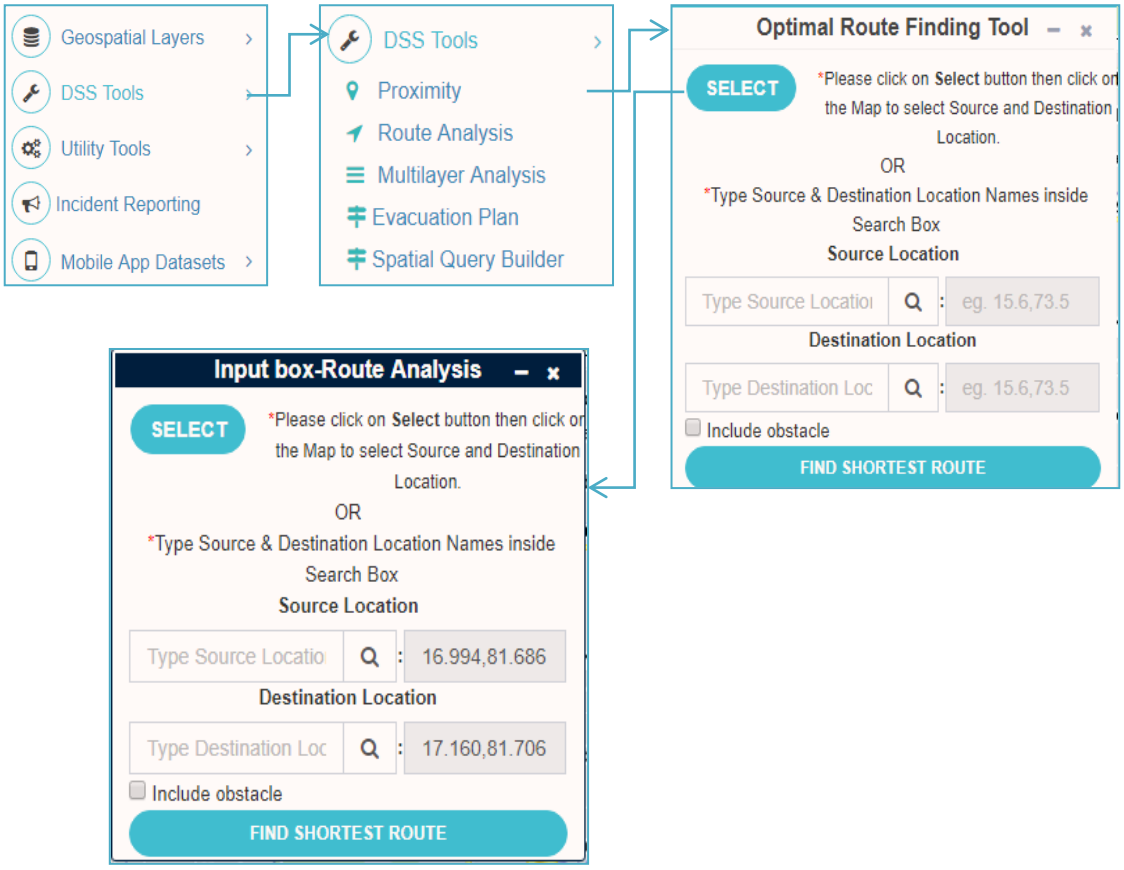


Figure 47: GUI for route plan tool

After clicking on the Find Shortest Route, Two possible routes displays on the map area. The Blue line route defines '**shortest route by Distance**' and the Green line route defines '**shortest route by Time**'.

Simultaneously an **Optimal Route Results** window opens; it shows the name of the road, Distance (in Km) and time takes to travel on the road.

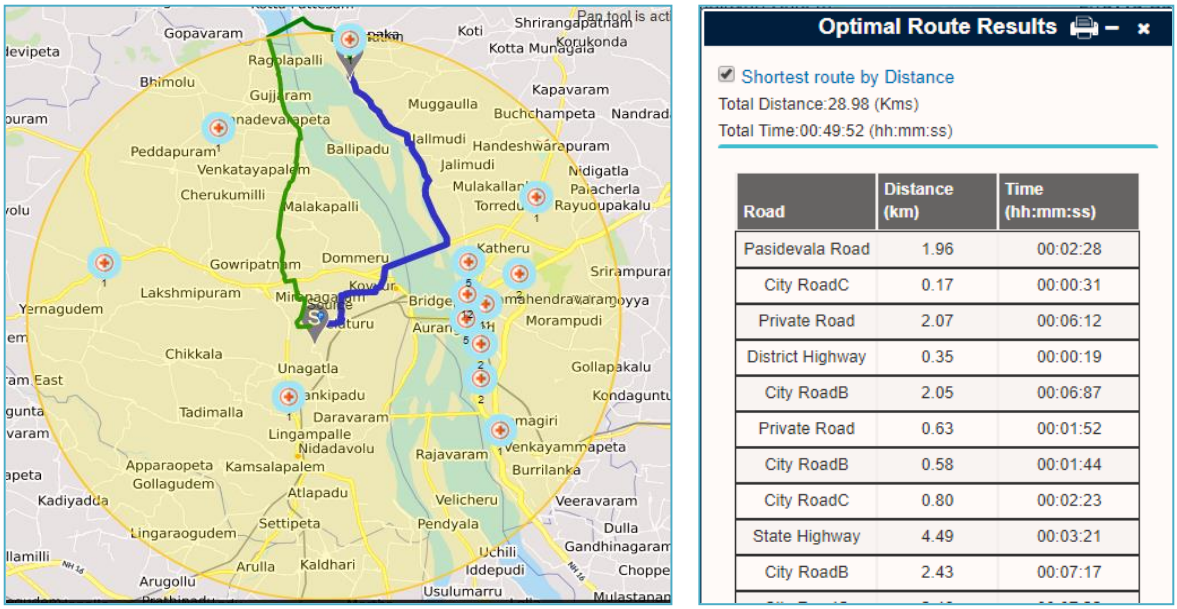


Figure 48 - Route Analysis between a source and destination

3.3.3.1. Route Analysis by Including Obstacle

Route analysis can be done by including obstacles/barriers; there are three types of obstacles in **Optimal Route Finding Tool** window, check the *Include obstacle* in the bottom of the window. A drop down menu **Select Obstacle Type** appears, in this menu three choices are there i.e. Line/Polygon/Disaster Specific Layer. Line, Polygon can be drawn manually and Disaster specific layer is selected form historical disaster data.

To include obstacle follow the steps till *Optimal Route Finding Tool* window in route analysis, Select Source & Destination locations, now mark the check box '*Include Obstacle*' in the drop down menu select obstacle type.

> ☞ Click DSS Tools > Route Analysis > Optimal Route Finding Tool window > SELECT Source & Destination > mark Include Obstacle > Select Obstacle Type > Draw Line/Polygon or Select disaster layer > Find Shortest Route

➢ Finding optimal route by including line as barrier

It generates the shortest/optimal route between any source and destination by avoiding the specified barriers (Figure 50).

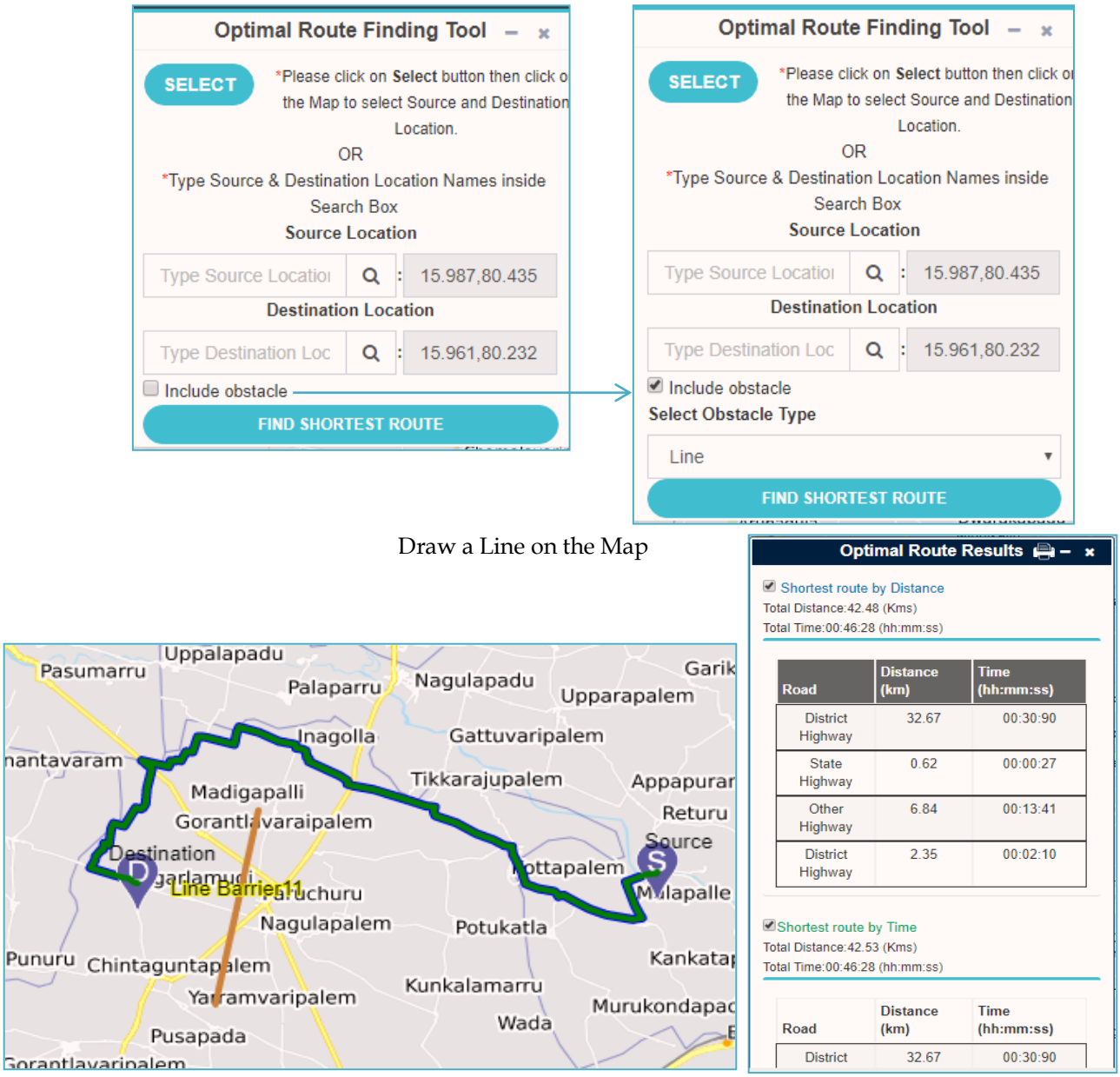


Figure 49 - Route Analysis Avoiding Line Barrier

Similarly user can select/draw polygon as barrier for finding optimal route along with polygon barrier

➢ Finding optimal route by including disaster layer as barrier

Users can also compute the optimal distance between the disaster site and emergency facilities by avoiding the disaster layers (Figure 51).

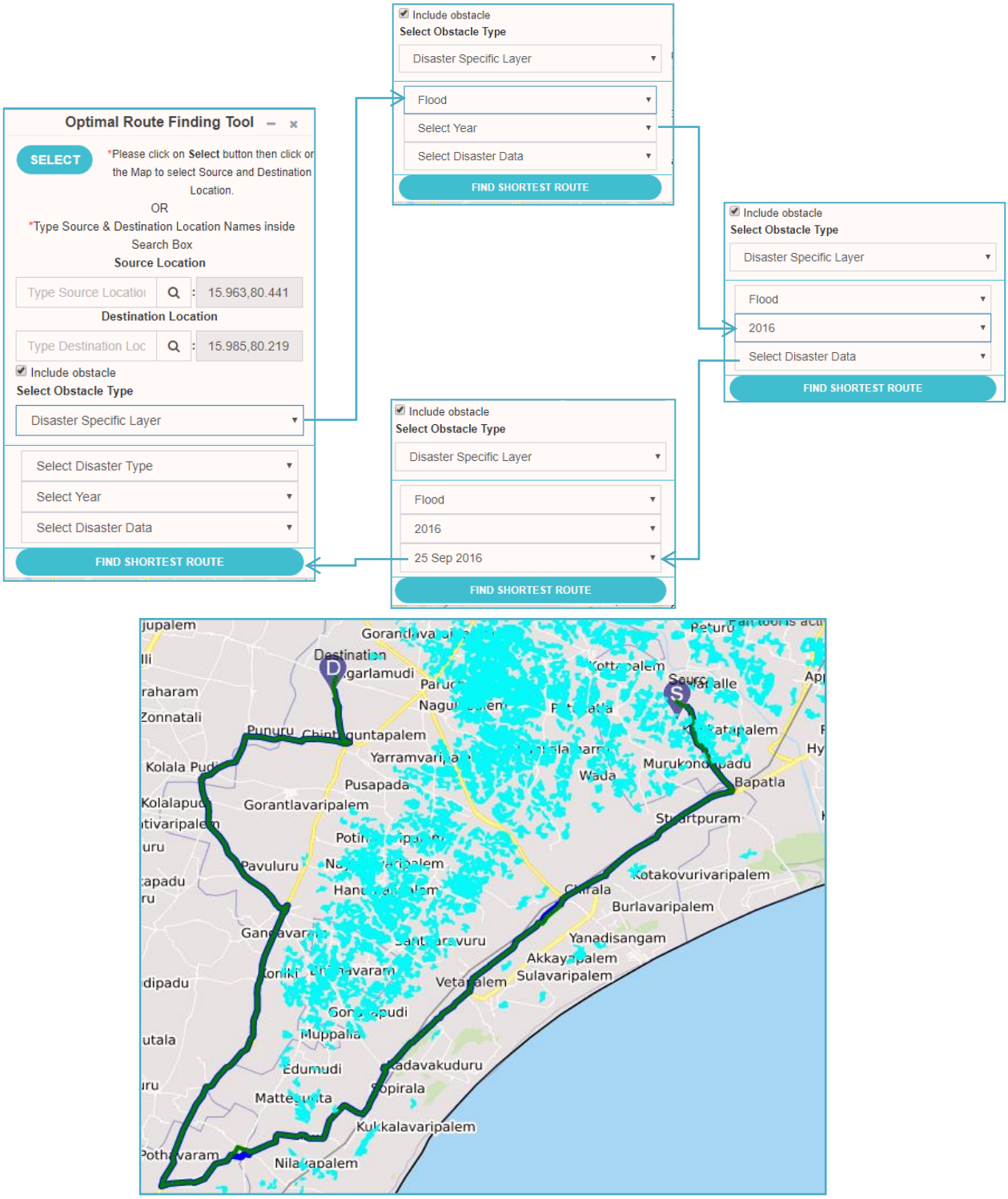
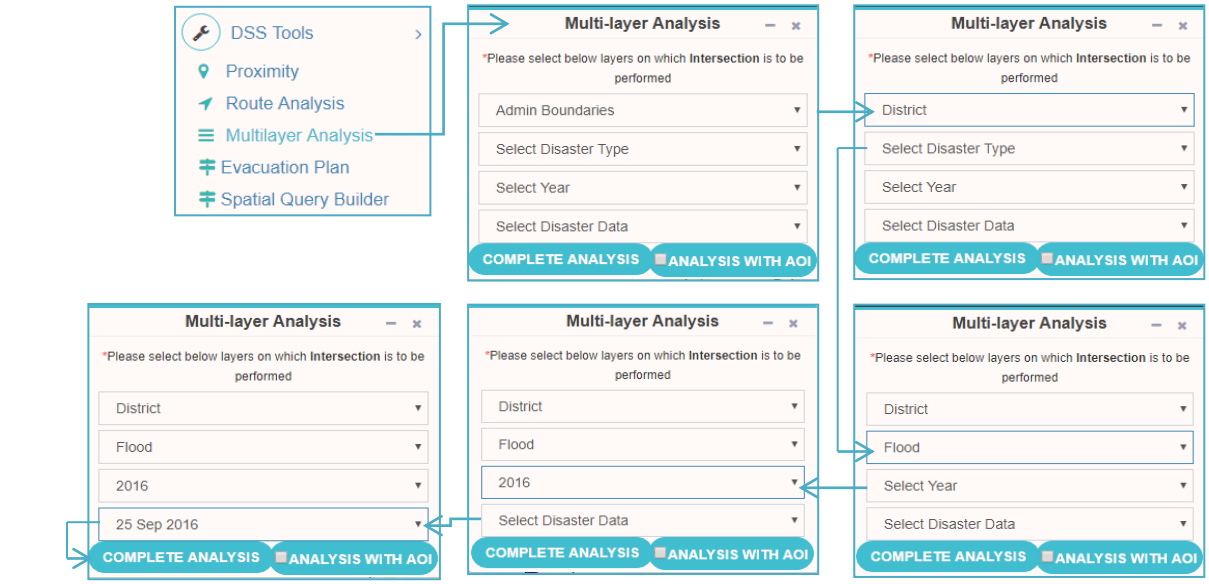


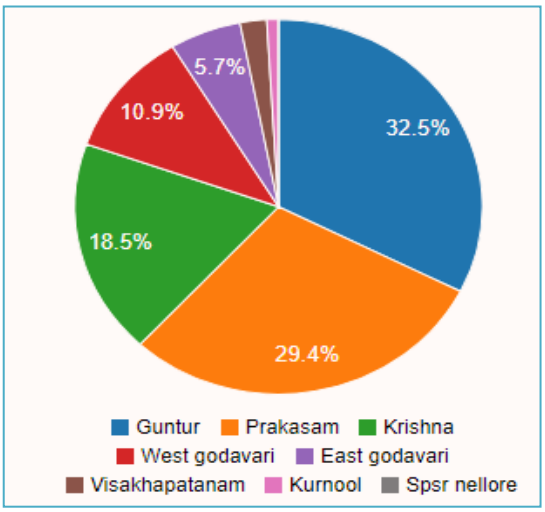
Figure 50 - Route Analysis Avoiding Flood Inundated Area

3.3.4. Multi-Layer Analysis

Multi-Layer analysis is used to analyze the percentage area of affected Districts, Taluk & Villages due to disasters (ex: Flood, Heavy Rains, and Cyclone etc.). And the same analysis can be performed with *Area of Interest* by drawing a simple polygon instead of choosing a disaster layer.

☞ Click DSS Tools > Multilayer Analysis > *Go to* Multilayer Analysis window > Select Admin Boundary (District/Taluk/Village) > Select Disaster Type (Flood/Cyclone/Forest fire/Heavy Rains) > Select Year > Select Disaster Data > *Click* Complete Analysis





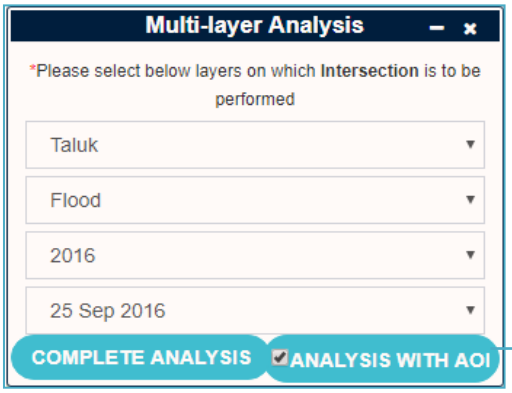
Analysis Results

Name	Inundated Area in Sqkm
Guntur	214.3453
Prakasam	194.2756
Krishna	122.3546
West godavari	71.8959
East godavari	37.3650
Visakhapatanam	13.9400
Kurnool	5.9981
Spsr nellore	0.1175

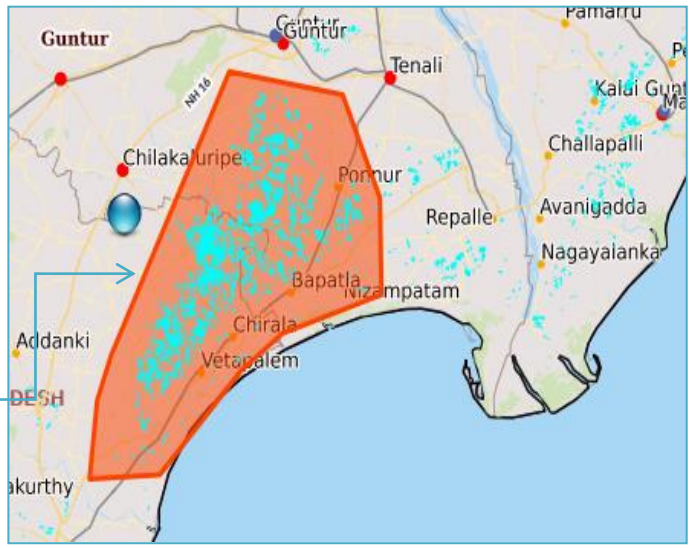
Figure 51 Multi-layer Analysis - Pie chart of Flood Inundated area at District level

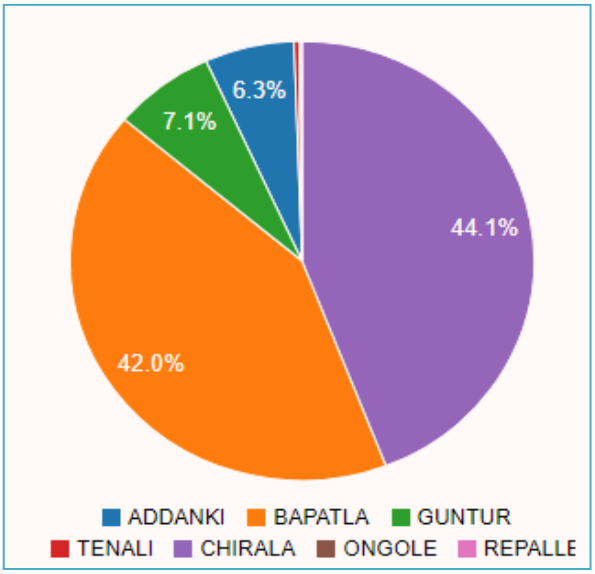
3.3.4.1. Multi-layer Analysis with AOI

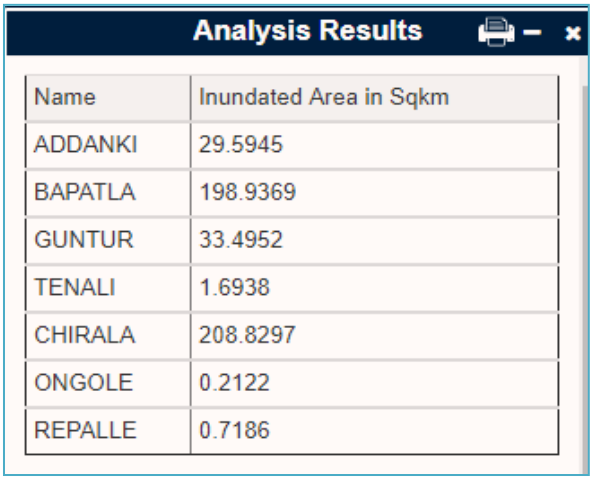
Follow the steps as in Multi-layer Analysis till *Select Disaster Data*. Now mark the check box of '*Analysis with AOI'*, a pop-up window is shown by asking "Please draw AOI/Polygon over disaster affected area on Map". Draw a polygon on the map and then the tool will be executed



*AOI - Area Of Interest







Analysis Results

Name	Inundated Area in Sqkm
ADDANKI	29.5945
BAPATLA	198.9369
GUNTUR	33.4952
TENALI	1.6938
CHIRALA	208.8297
ONGOLE	0.2122
REPALLE	0.7186

Figure 52: Multilayer Analysis with AOI at Taluk Level

3.3.5. Spatial Query Builder

Spatial query builder is used to query/filter the existing spatial layers and display particular data on the map. This tool is enabled for all base layers and Point of Interest (POI) data.

> ☞ Click Spatial query builder > go to Query analyst window > select Facility > select Sub-category > select Attribute > select an Operand > select Value > click Apply

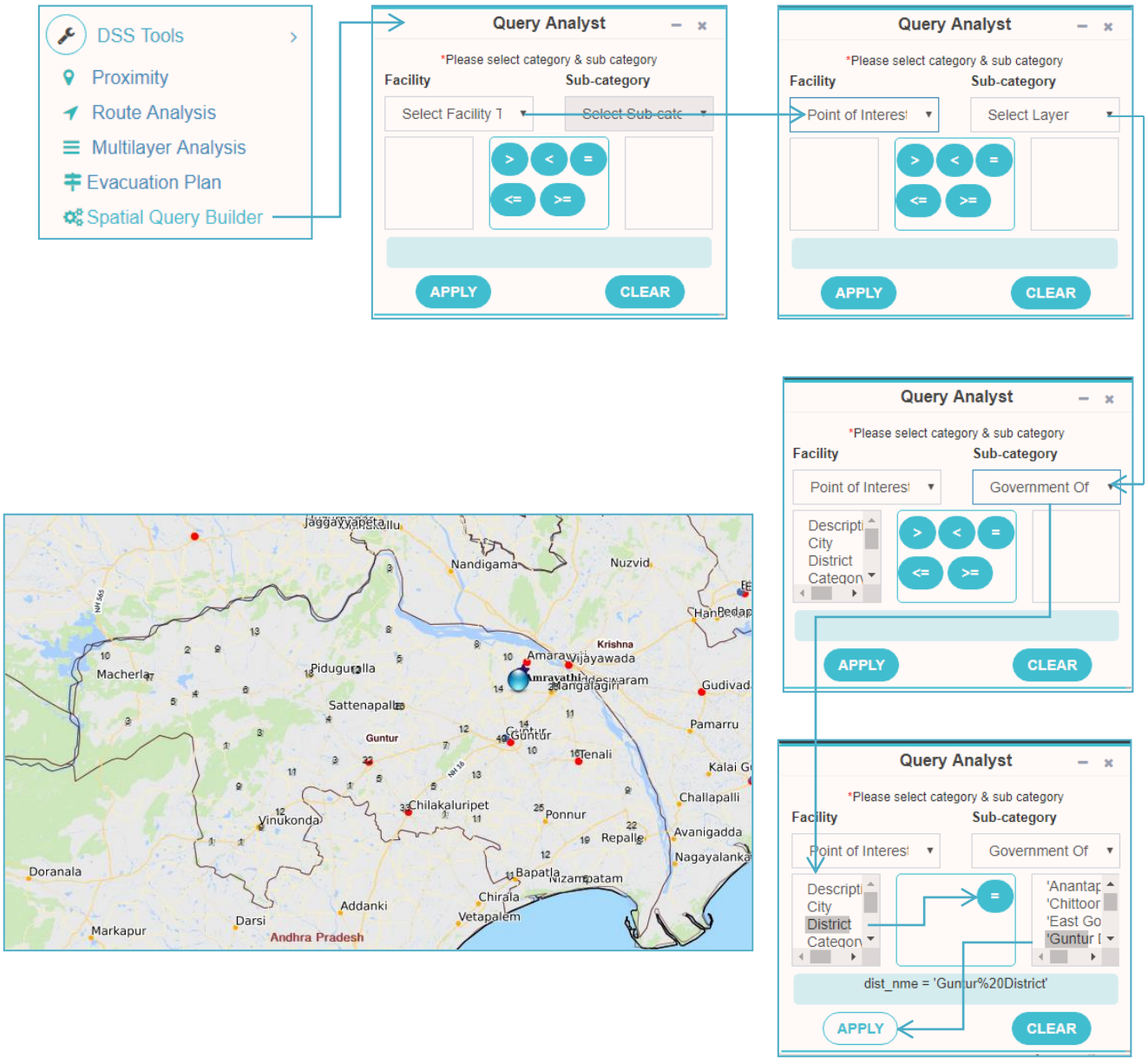


Figure 53 – Spatial query builder output

3.4. Utility Tools

Utility tools perform simple map functions/operations like distance and area measurement, search and visualization of external WMS/Vector data on the map etc. These tools include;

1. **Distance Measurement-** for measuring area on the map
2. **Area Measurement-** for measuring distance on the map
3. **Information Here –** to get information at any point
4. **Geospatial Search-** Searching of geospatial layers (POI, State/city/town/hospital)
5. **Add Geospatial Data –** Adding of user geospatial data on map.

3.4.1. Distance Measurement

To measure distance between any two points on the Map;

> ☞ Click Utility tools > Distance Measurement > Select any two points on the map.

Figure 54 - Distance Measurement

3.4.2. Area Measurement

To measure area on the map;

☞ Click Utility Tools > Area Measurement > Draw a polygon on the map

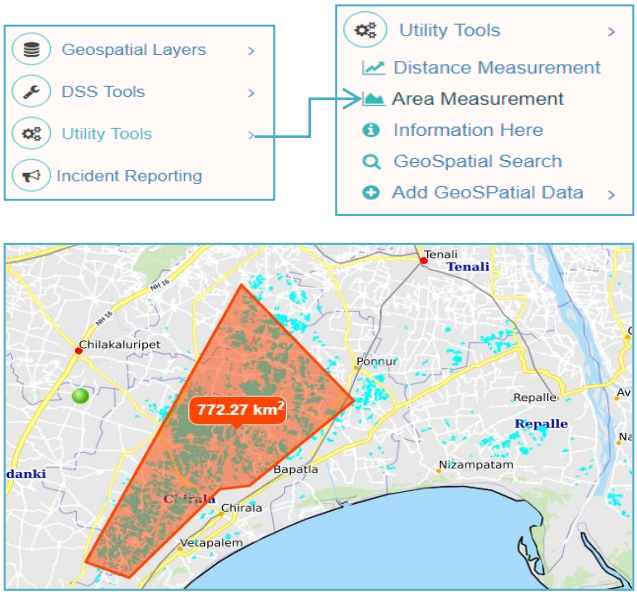


Figure 55 - Area Measurement

3.4.3. Information Here (Spatial information of any point on a map)

This tool is used to find location details at any click on the map

☞ Click Utility Tools > Information here > *Click* on the map

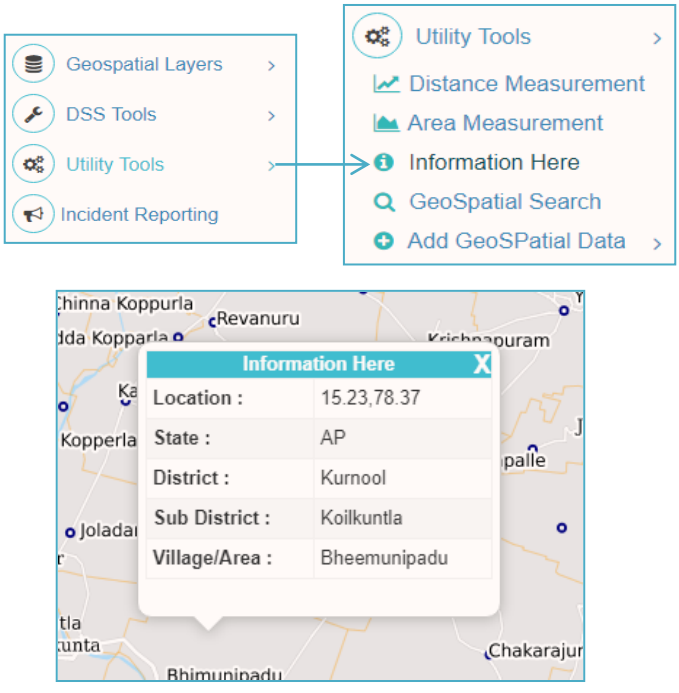
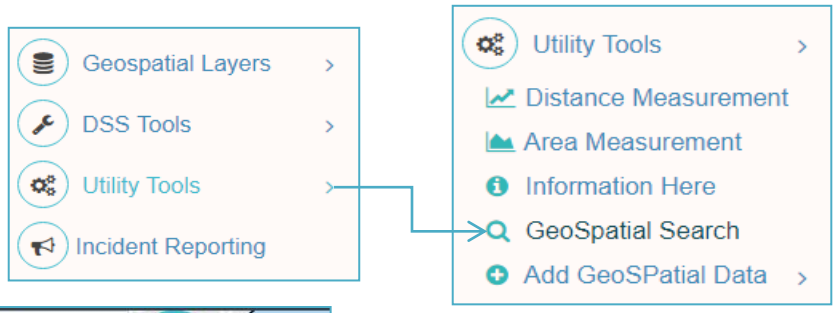


Figure 56- Information Here output

3.5. Geospatial Search: It is used to search the map with any key word like hospital, town name

☞ Click Utility Tools > Geospatial Search > Input POI/Area name > select an option from drop down menu



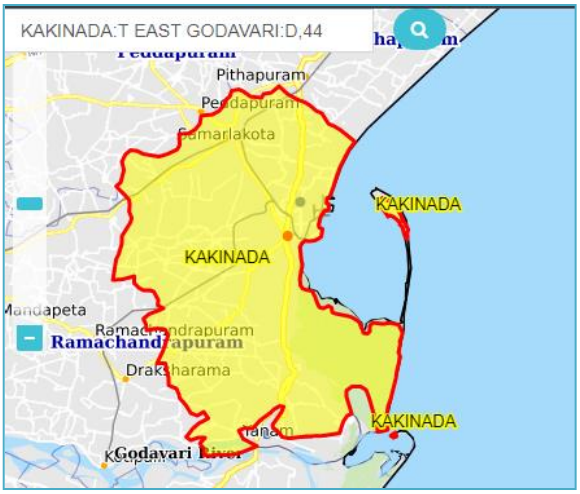


Figure 57 - Geospatial search for Area

Figure 58 - Geospatial search for Hospital (i.e. POI)

3.6. Add Geospatial Data

Through this module user can view the geospatial data on the map other than the data provided by NDEM. User can upload two types of data i.e. Vector and WMS data. Under Vector user can upload KML or Geo-JSON files. KML is native format of Google Maps, hence user can download the Google Earth files in KML format (Note: not KMZ format) and upload the same in this module. WMS services are usually contains an URL, Enter the URL and Layer name in the given fields to fetch the layer from the source.

☞ Click Utility Tools > Add Geospatial Data > Select Vector/WMS >

1. **Vector > Click Choose File > Upload the file > Click View Data on Map**
2. **WMS > Enter the WMS URL > Click Load**

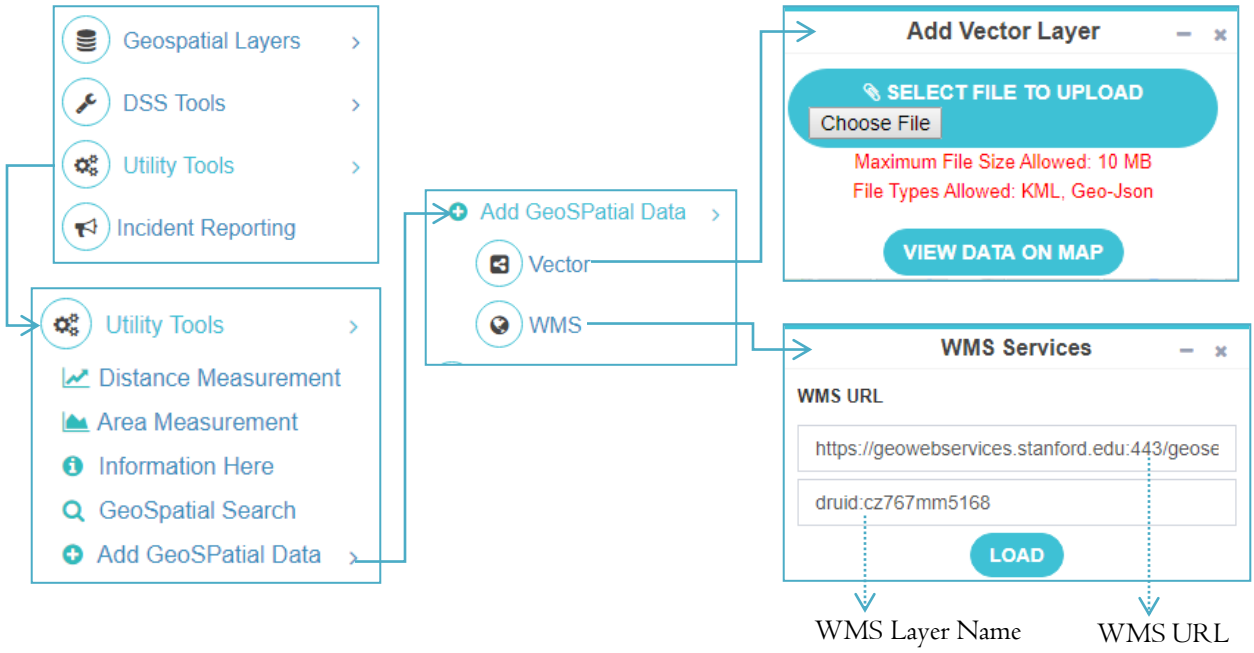


Figure 59 – Adding of External WMS

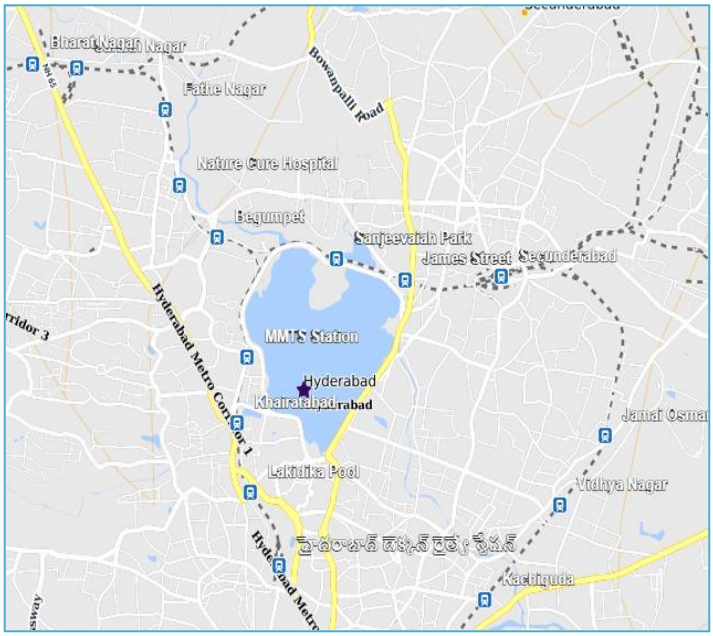


Figure 60 – Adding of KML file

3.7. Incident Reporting

User can report an incident occurred at any place by using *Incident reporting*.

> ☞ Click Incident Reporting > *Click* SELECT > select a point on the map or input the coordinates where incident occurred > Enter Incident Detail, Reporter name, mobile no. > *Click* Report Incident

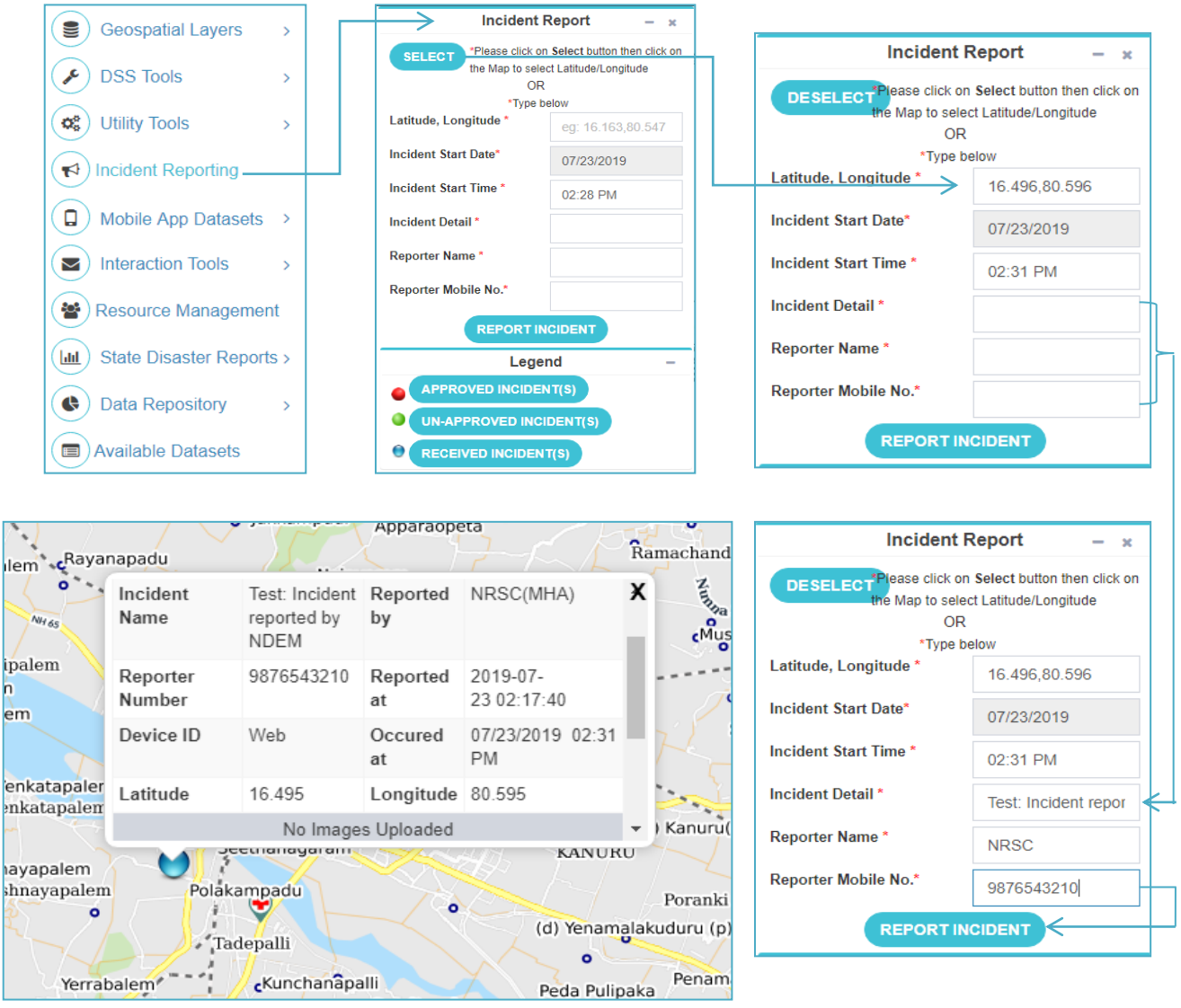


Figure 61 - Incident reporting from portal

User can update the location by using *SELECT* option in the pop-up window, highlighted from the previously reported incident.

3.8. Mobile App Datasets

NDEM Geoportal is an equipped with a mobile application to support in disaster/emergency management starting from reporting incident to providing relief measures. The NDEM Mobile Application provides the following four important modules for disaster management.

- Incident Report
- Relief Management
- Geo-Spatial Data collection
- Geo-tagging

The calls (incident reports) and datasets which are sent and uploaded from mobile app respectively can view on NDEM geoportal under Mobile App Datasets tab.

☞ Click on **Mobile App Datasets** in Left Panel (figure 61)

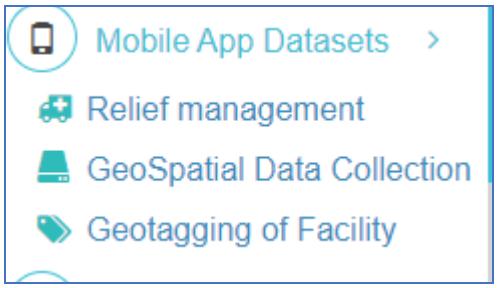


Figure 62: Mobile App Datasets tab in Left Panel

3.8.1.1. Relief Management

Relief Management application is used by field officials to send calls or quick information about the disaster during disaster response activities. The information that can be sent from the mobile device is organized into the following four modules.

- **Distress Call**: It is like a SOS message. The module sends a pre-defined short message along with location coordinates and mobile ID with time stamp.
- **Emergency Call**: It is used for sending a short message from the site requesting specific help / support such as "send water bottles", "send medical kits" etc.

- **First Info Report**: For sending a qualitative report of the disaster situation along with field photographs and location coordinates in a specified format.
- **Summary Report**: To send quantitative report of the disaster situation along with field photographs and location coordinates in a specified format.

In this tab, the data sets which are collected under Relief Management module can be visualized on the map.

☞	Click on Relief Management under Mobile App Datasets tab.
☞	Check one of the four sub modules from Relief Management module (Say Distress Call).
☞	All the Distress call are visualized on the map (figure 62) and call details are displayed in table.
☞	Click on any distress call icon on map to display the call details and status (figure 63).
☞	Officials can respond to distress calls by clicking "**Take Action**" button and giving required details(figure 63)
☞	SMS will be sent to concerned official updating the status

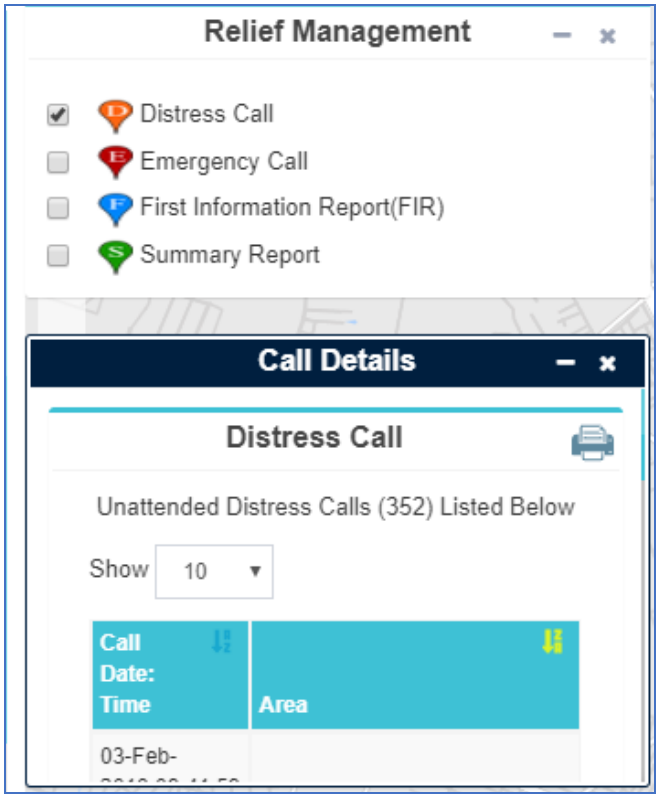


Figure 63: Selecting Distress Call from Relief Management menu

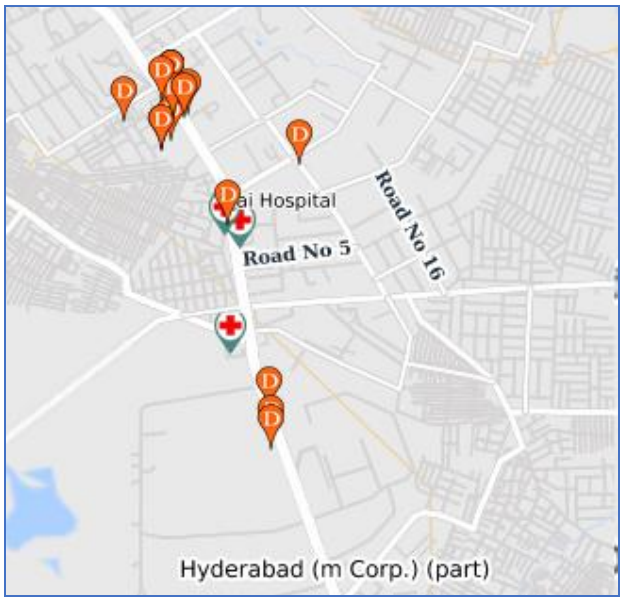


Figure 65: View of Disaster Calls on Map Viewer

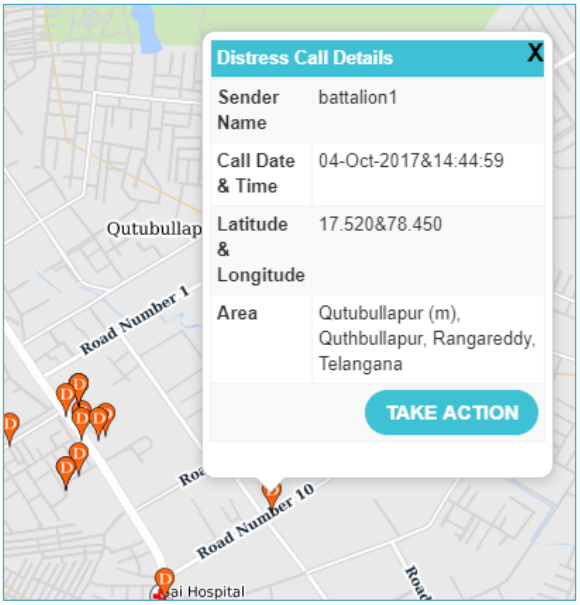


Figure 64: Disaster Call details

Design for Emergency call is same as Distress Call. During Rescue operation, personnel on the ground can give periodic updates to the official in control room as more detailed report through First Information Report. Images that were sent along with the report also can be visualized on the map (figure 65). Similarly, Summary report can be send at closer of the event with the complete event report.

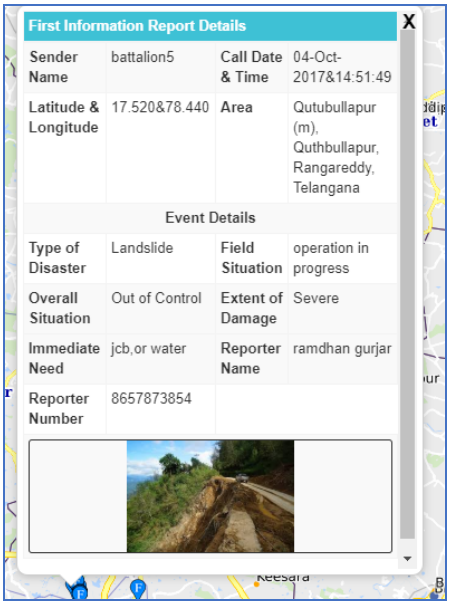


Figure 66: Showing FIR Details on map

3.8.1.2. Geospatial Data Collection:

Using this application one can collect the field level geo spatial data of emergency facilities in real/near-real time with photographs and send to server. Information on the following four category facilities can be sent from the mobile devices.

- **Medical facilities**: Type of hospital, facilities available, services available etc
- **Relief Shelters**: Type of shelter, capacity, facilities available etc
- **Police Station**: Zone, Area name, Contact number etc.
- **Civil Supply Godown**: Type of godown, capacity etc.

In this tab, the data sets which are collected under Geo-spatial Data Collection module are visualized on the map

☞	Click on **Geospatial data collection** under Mobile App Datasets tab
☞	Select Hospital Facility from Geospatial Data input box.
☞	Hospital Details can be visualized and related points are overlaid on map (figure 6.7)
☞	Details of hospitals can be obtained by clicking icon on map or by clicking respective hospital list (figure 6.8).
☞	Attributes of various facilities can be added from portal by clicking on "Edit Data" button (figure 6.9).

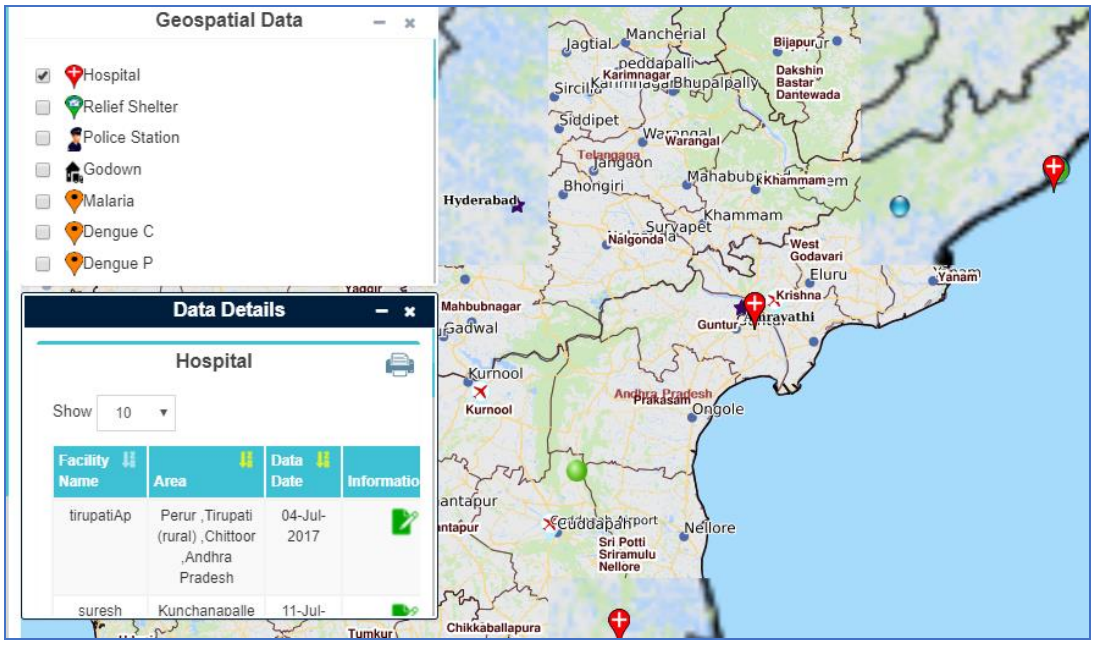


Figure 67: Geo Spatial Data Collection- Hospital details

Click on any hospital on map to view the details as show in the Figure 68.

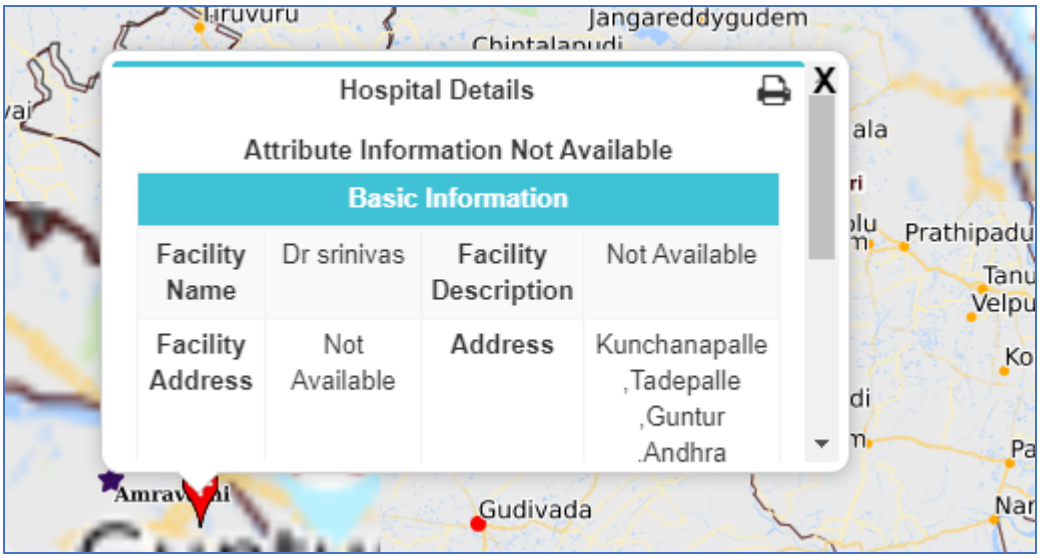


Figure 68: Hospital location details

The attributes of the collected features (under Geo-Spatial Data Collection and Geo-tagging modules) can also be edited and updated in the portal.

☞	Click on Edit icon a form will popups as shown in the Figure 69.
☞	Fill the required fields and click on '**UDATE ATTRIBUTE**' button to update the modifications.

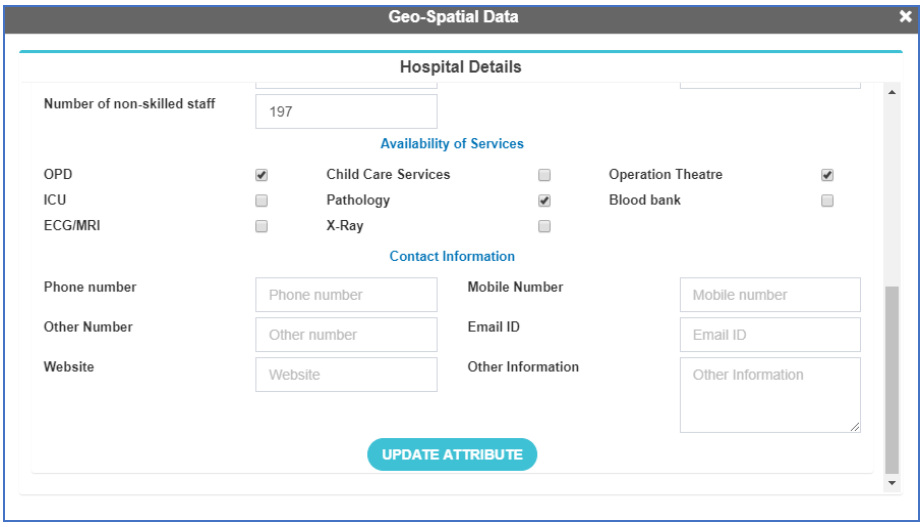


Figure 69: GUI for attribute update form

3.8.1.3. Geo-tagging for Emergency facilities

Under this tab the facilities which are collected using Geo-tagging module in the Mobile App are visualized on the map viewer

- ☞ Click on **Geotagging facility** under Mobile App Datasets App
- ☞ Check any facility (Say Relief Shelters)
- ☞ The collected relief shelter locations are showed on the map viewer
- ☞ Click ion relief shelter icon on map to see the feature detils

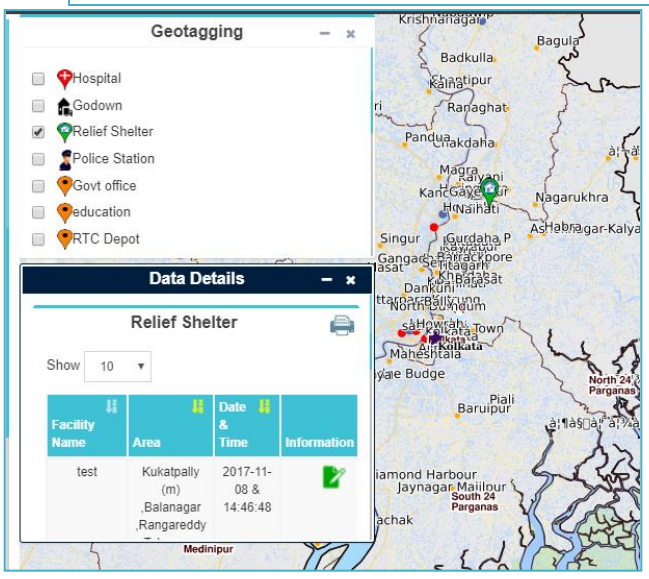


Figure 71: Viewing of Facilities under Geotagging module

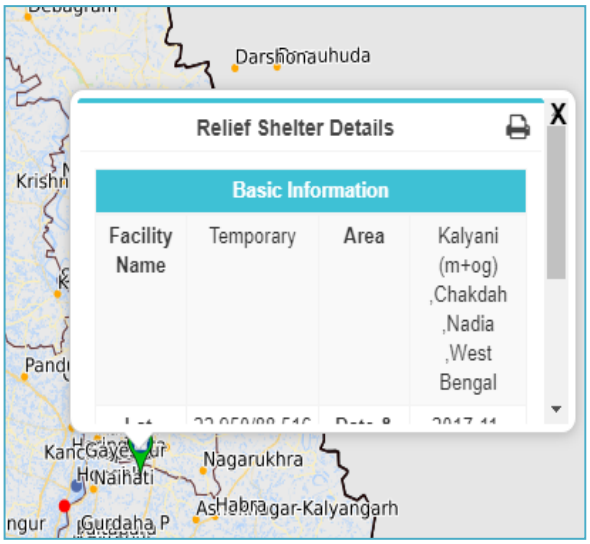


Figure 70: Relief Shelter Facility details

3.9. Interaction Tools

Interaction services provide the single point communication system for all users. Through this portal, user can closely interact to each other in different mode. A user can interact with disaster management officials up to Mandal/Taluk level through tools provided in the Interaction toolset. It include:

1. **SMS**
2. **Broadcast Message**
3. **Mail Box**

3.9.1. SMS

User can send an Individual message or a Group message. Group SMS involves pre integration of contact details of each district up to mandal level.

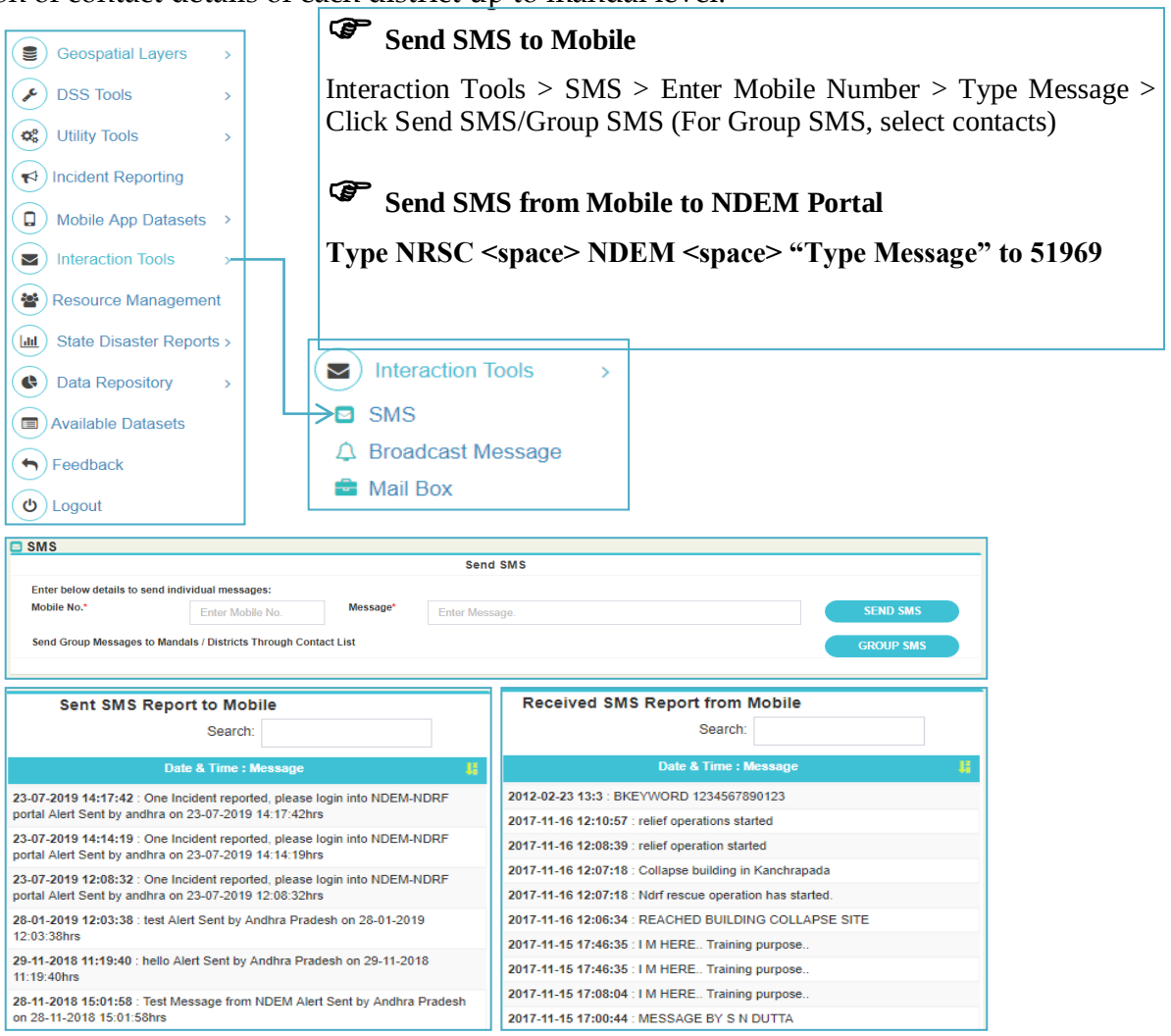


Figure 72 – GUI for sending SMS

3.9.2. Mail Box

Interaction portal also provides an option to compose, visualize received and sent mails. Inbox contains received mails. User can read, forward and delete these mails. Authorized user can send Mail to selected/all districts and states and can receive mails vice versa.

☞ Click on **Interaction Tools -> Mail Box**

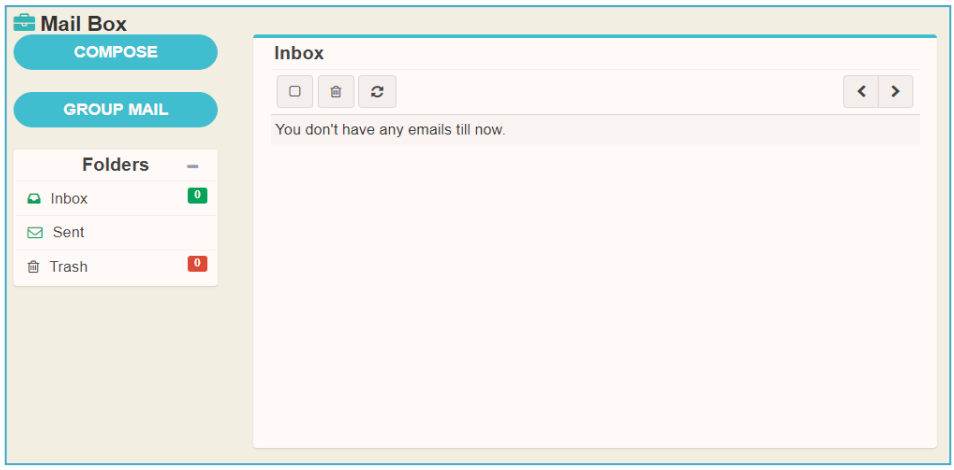


Figure 73 - Inbox for Mailbox

3.9.2.1. Compose Mail

☞ *Select* Interaction Tools > *select* Mail Box > *Click* Compose > Type District/State name in TO text box > Add Subject > Enter your message > Attach file if contains > *Click* SEND

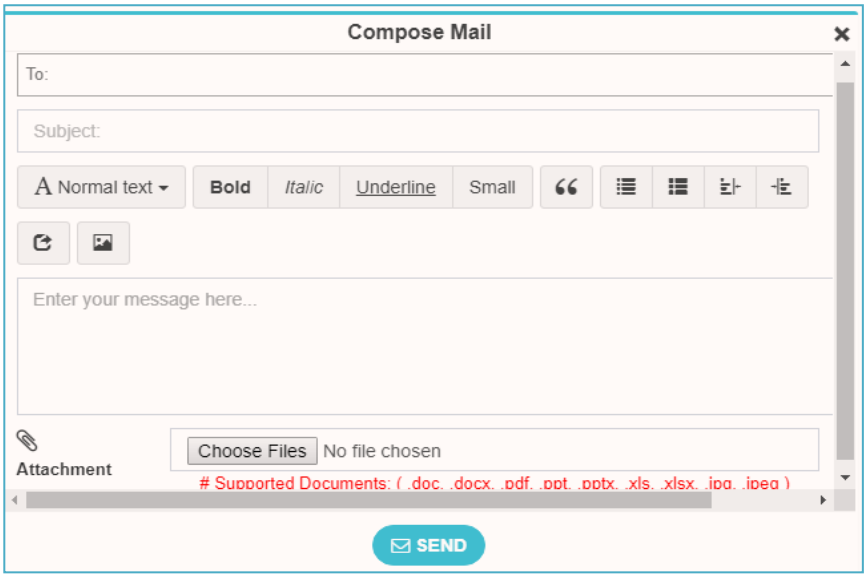


Figure 74 – Composing of a Mail

3.9.2.2. Group Mail

☞ *Select* Interaction Tools > *select* Mail Box > *Click* Group Mail > Select one or more Districts > Enter your message > Attach file if contains > *Click* Send to Selected Contacts

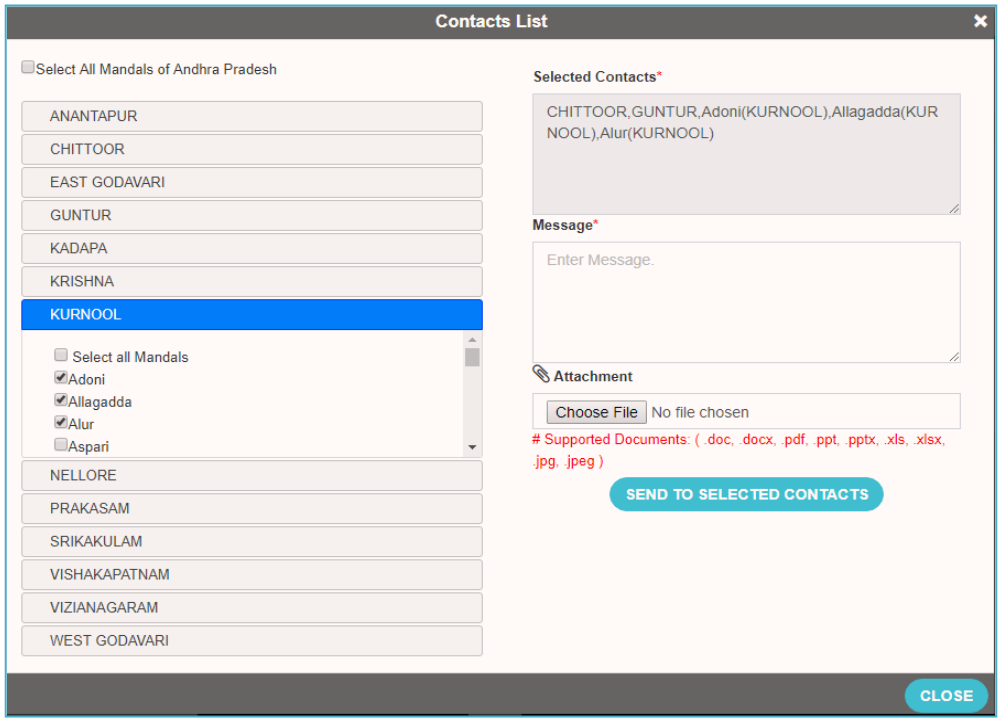


Figure 75 - Adding contacts in group mail

3.9.2.3. Broadcast Message

☞ Click on Interaction Tools -> Broadcast Message

This module Broadcasts a message to all the NDEM users by the approval of a moderator. There are two moderators MHA & NRSC. Choose one of the moderators, and enter your message. If any attachment is there upload it by clicking on choose file. User can send this message to all the registered mobile numbers on NDEM by marking the Send SMS checkbox, then click Broadcast. The selected moderator has to approve or reject the broadcast message. If it is approved, the message will appear in the published messages in Broadcast message window.

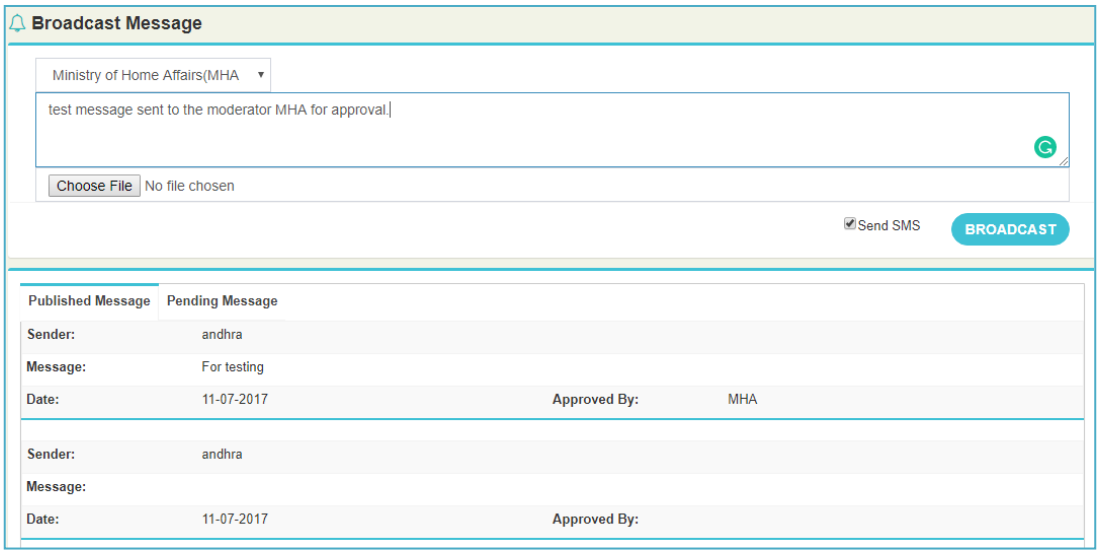


Figure 76 - Broadcast Message Service

3.10. Resource Management

This module is used to manage the resources (allocation and reallocation) in the godowns across the country. It gives an overview of the available resources in a particular godown and distribution of these resources to the relief shelters during disaster by creating a rescue team. User can add a new godown to the existed list by using its latitude and longitude. Each godown contains a list of categories under which commodities can be added in Allocation & Reallocation tab.

☞	Click **on Resource Management** under left panel

For ease of management this module is divided into three Sub modules (Figure 78)

- **Resource Inventory**- For adding data
- **Allocation Re Allocation –** distribution of resources
- **Reports –** Transaction reports

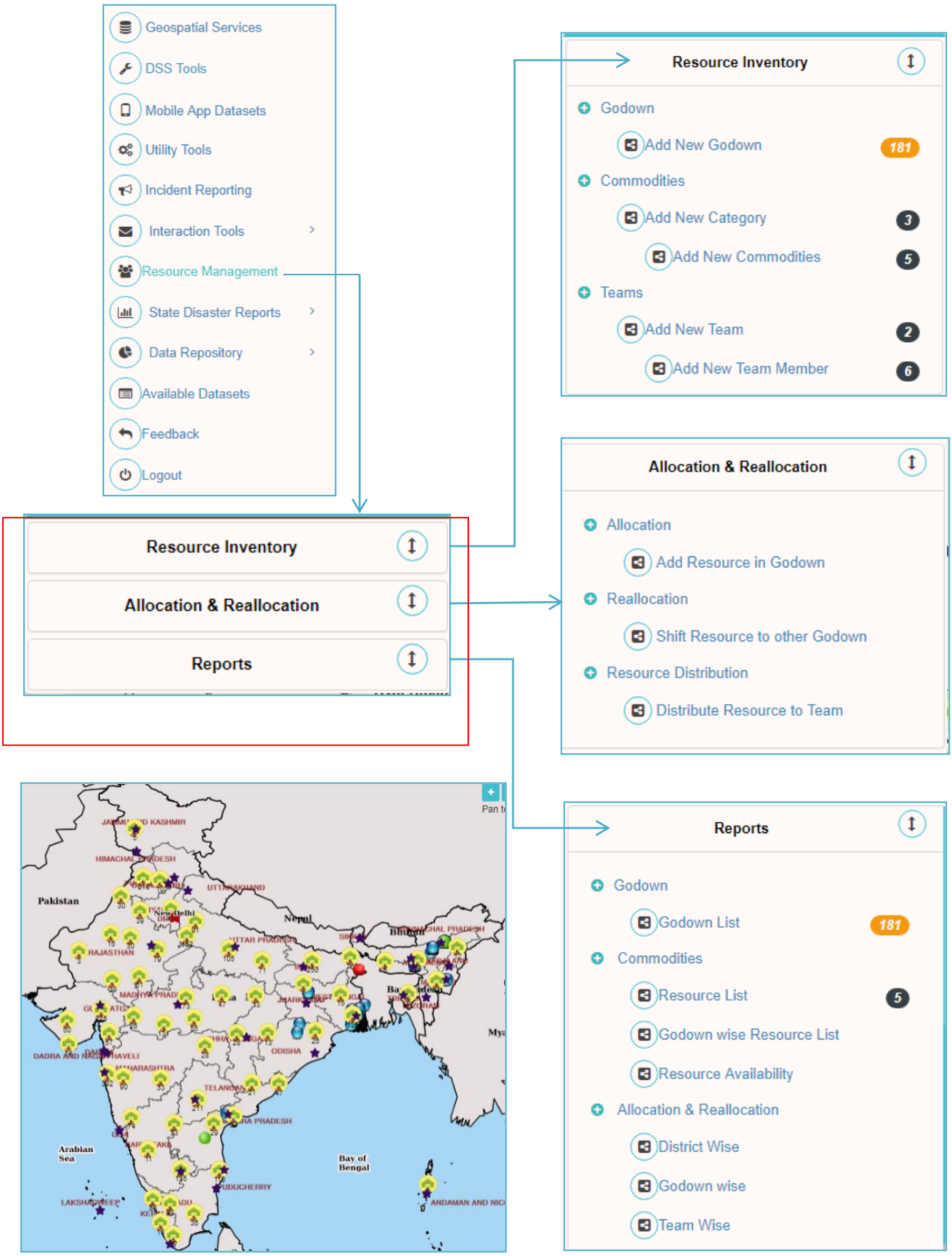


Figure 77 - Godown locations across India

3.10.1. Resource Inventory

Resource management inventory sub module can be used to add Godown, add category details and team details.

3.10.1.1. Godown

User can add a new godown to the existing list of godowns. This godown can be either permanent or temporary type. The location of the godown can be chosen on the map or user can input the latitude & latitude up to three decimal digits.

- ☞ Select **Resource Management** tab under left panel
- ☞ Click on **Resource Inventory**
- ☞ Select **Godown**
- ☞ Click on **Add Godown** and a form will popup (figure 77)
- ☞ Fill the required fields and click on **ADD GODOWN** button

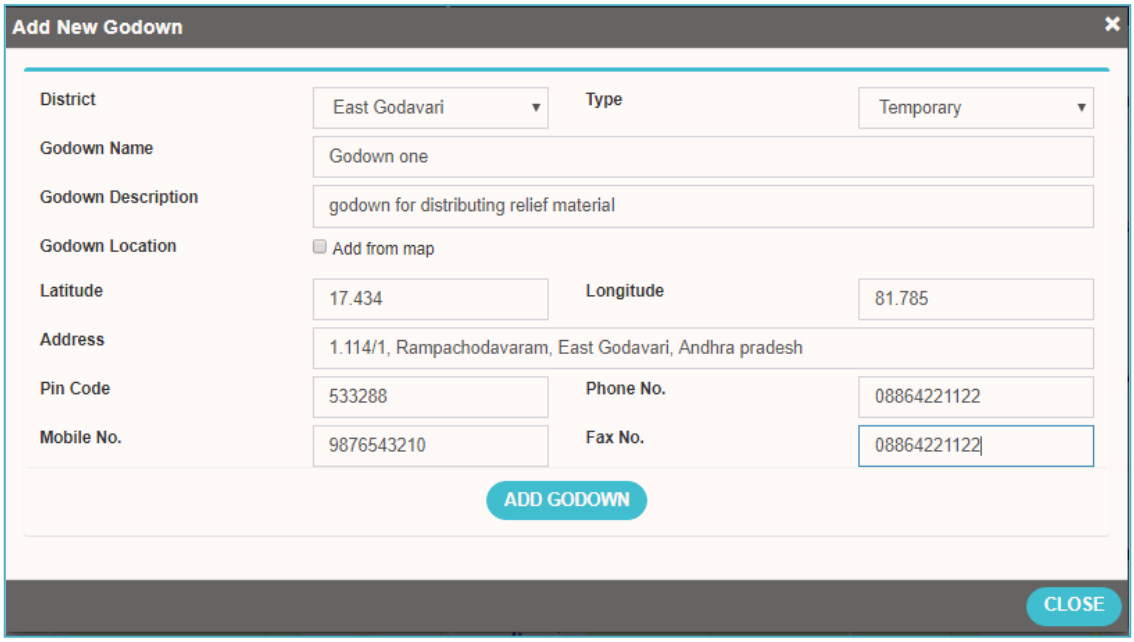


Figure 78 - Adding a new godown

3.10.1.2. Commodities

Users can add commodities category types and commodities under this tab

- ☞ Select **Resource Management** tab under left panel
- ☞ Click on **Resource Inventory**
- ☞ Select **Commodities**
- ☞ Click on **Add New Category/ Add New Commodities** and a form will popups (figure 78, figure 79)
- ☞ Fill the required fields and click on **ADD CATEGORY/ADD RESOURCE** button

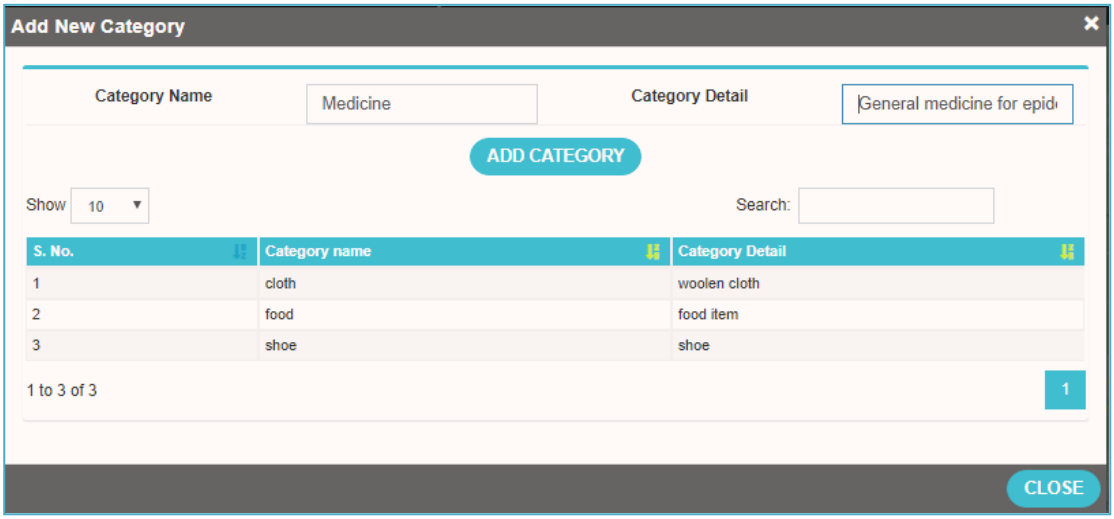


Figure 79 - Adding new category

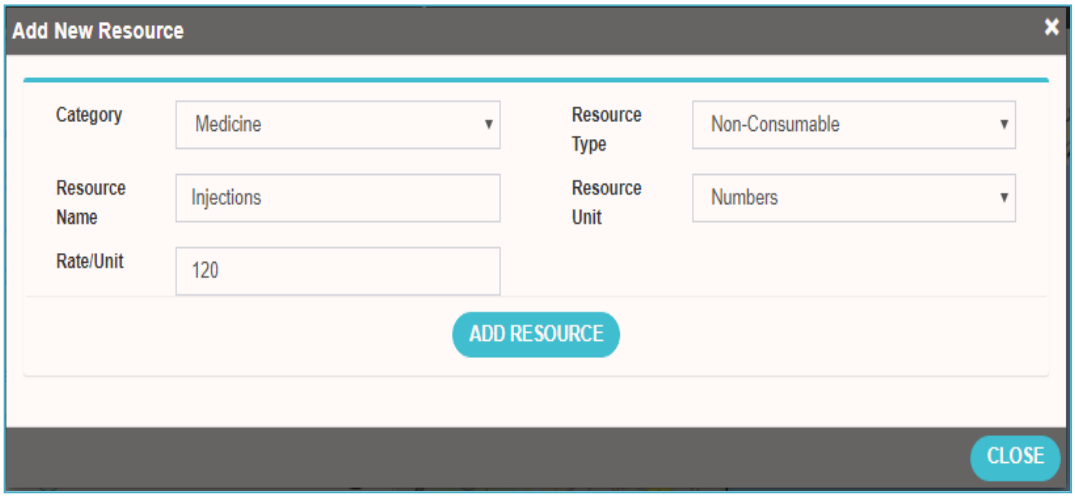


Figure 80 - Adding new resource/commodity

3.10.1.3. Teams

User can create a rescue team, to distribute the relief material to the relief shelters or to the mass. Each team contains a leader and members. It holds a record of physical allocation of relief material to the team.

- ☞ Select **Resource Management** tab under left panel
- ☞ Click on **Resource Inventory**
- ☞ Select **Teams**
- ☞ Click on **Add New Teams/ Add New Team Member** and a form will popups (figure 80, figure 81)
- ☞ Fill the required fields and click on **ADD TEAM/ADD TEAM MEMBER** button

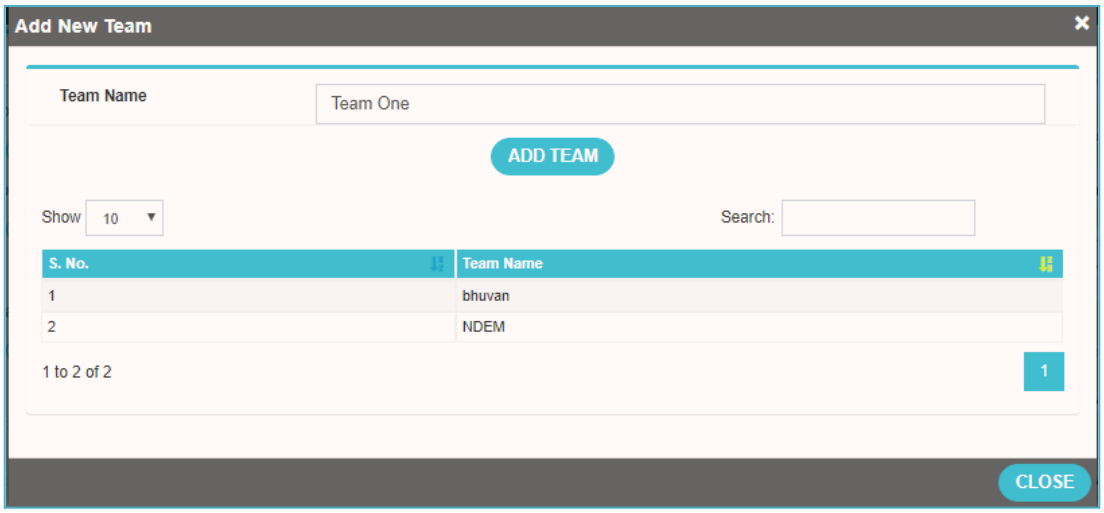


Figure 81 - Creating a new team

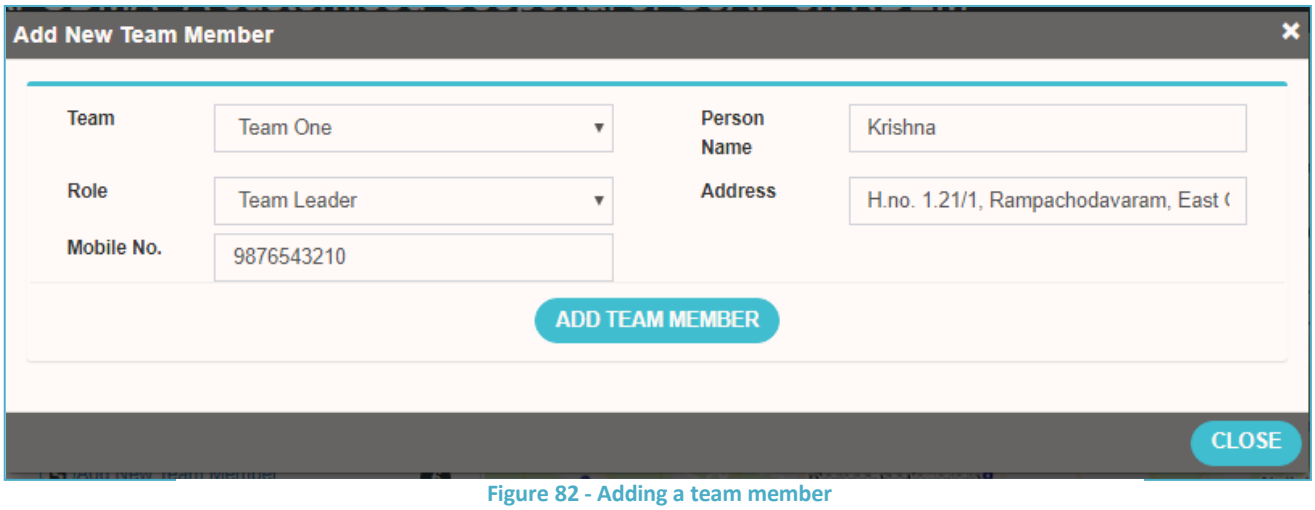


Figure 82 - Adding a team member

3.10.2. Allocation & Reallocation

Users allocate resources to any Godown as per the need or relocate the resources from one Godown to another or distribute the resources among different teams.

3.10.2.1. Allocation

Under this tab user can allocate the resources to a particular godown

- ☞ Select **Resource Management** tab under left panel
- ☞ Click on **Allocation & Reallocation**
- ☞ Select **Allocation**
- ☞ Click on **Add Resource in Godown** and a form will popups (figure 82)
- ☞ Fill the required fields and click on **SUBMIT** button to allocate the resource to the godown

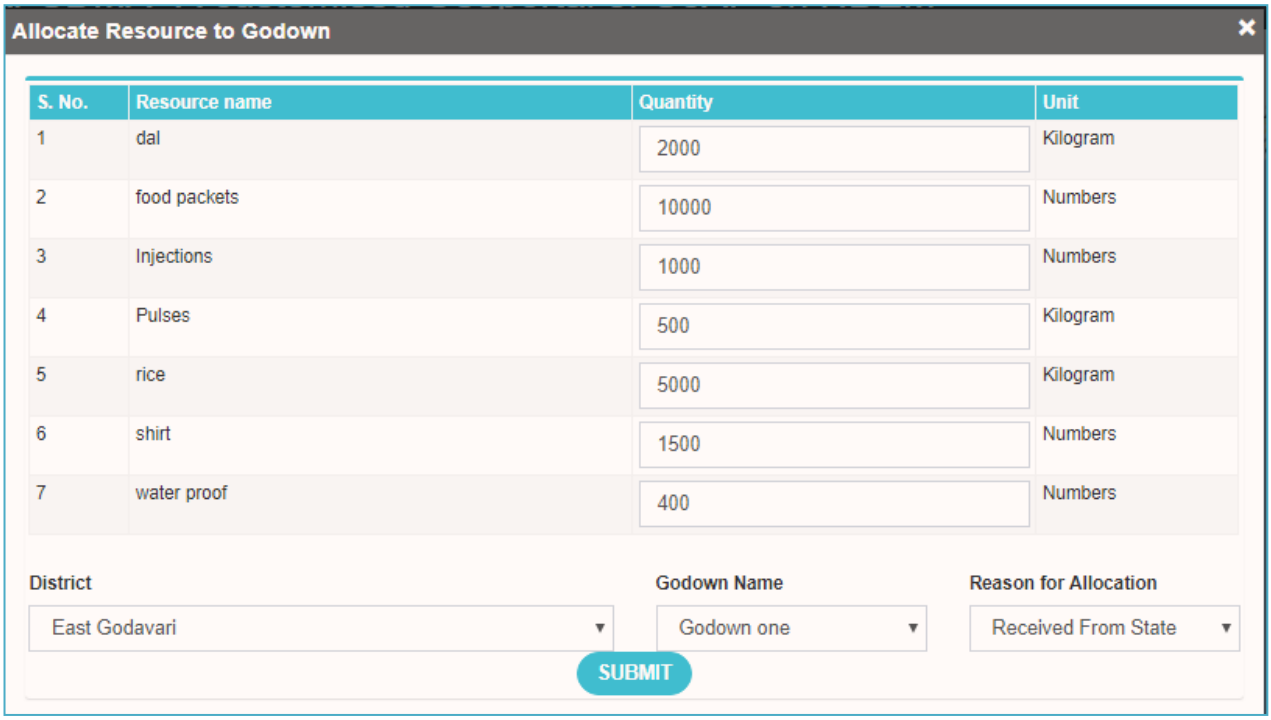


Figure 83 - Allocating Resources to Godowns

3.10.2.2. Reallocation

Users can allocate their resources from one godown to another godown by using Reallocation tab.

- ☞ Select **Resource Management** tab under left panel
- ☞ Click on **Allocation & Reallocation**
- ☞ Select Rea**llocation**
- ☞ Click on **Shift Resource to other Godown** and a form will popups (figure 2)
- ☞ Select the source and destination godowns to reallocate the resources from source godown to the destination godown (figure 83).

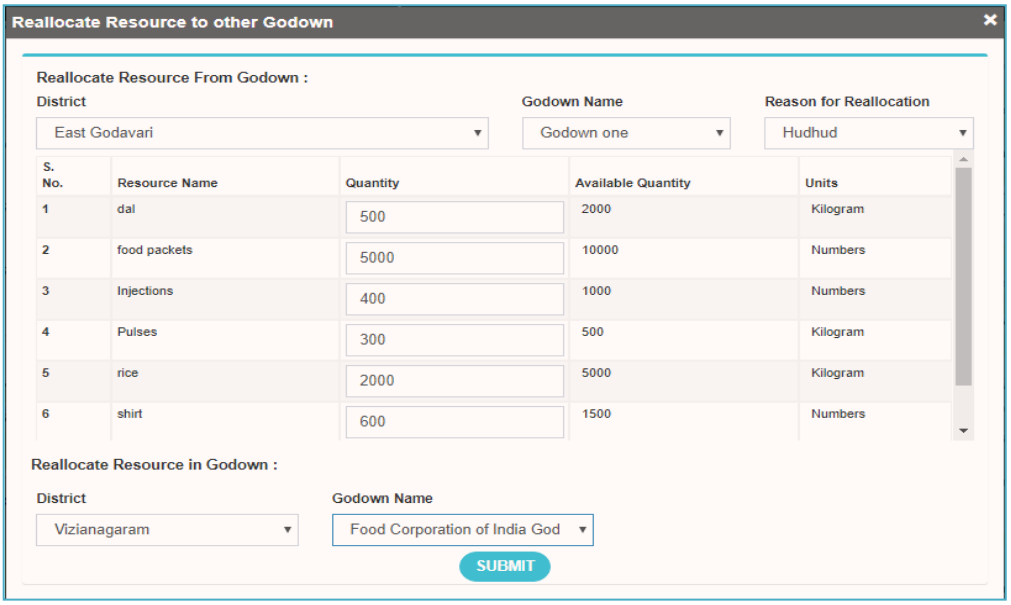


Figure 84 - Reallocating Resources to another Godown

3.10.2.3. Resource Distribution

In Resource Management module user can distribute the available resources to the teams based on the reasons.

- ☞ Select Resource Management tab under left panel
- ☞ Click on Allocation & Reallocation
- ☞ Select Resource Distribution
- ☞ Click on Distribute Resource to Team and a form will popups (figure 84)
- ☞ Select the source and destination godowns to reallocate the resources from source godown to the destination godown (figure 83).

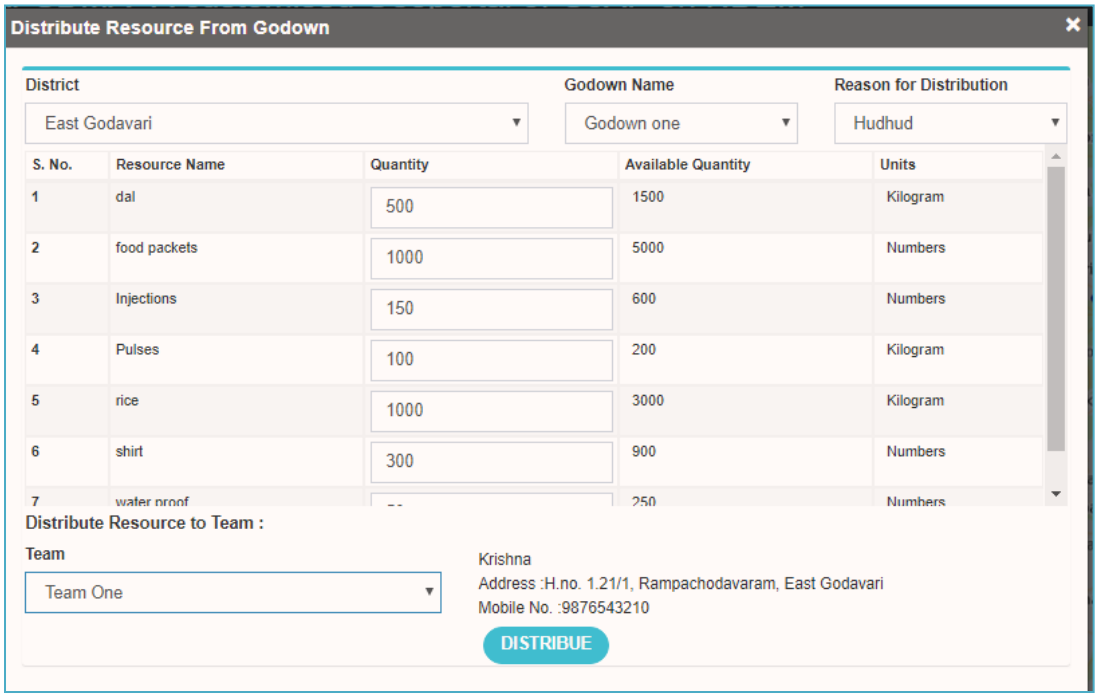


Figure 85 - - Distribution of Resources to Rescue Team

3.10.3. Reports

In this tab, User can get the detailed reports about available Godowns and commodities and the distributed resources in godown wise, district wise and team wise.

3.10.3.1. Godown List

☞ Click on **Reports ->Godown ->Godowns List ->** Select the **District** Name -> Select **Godown** Name

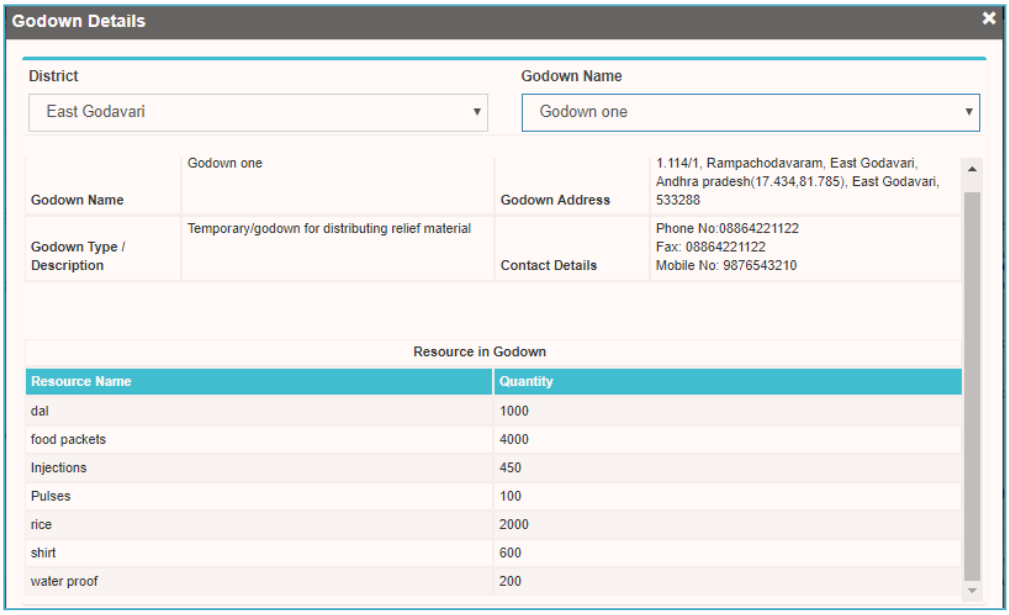


Figure 86 - Details of a Godown in a District

3.10.3.2. Commodities

- **Resource list:** It gives an report of the available resources and its quantity in the entire state.

☞ Click on **Reports ->Commodities ->Resource List ->** a window popups (figure 86)

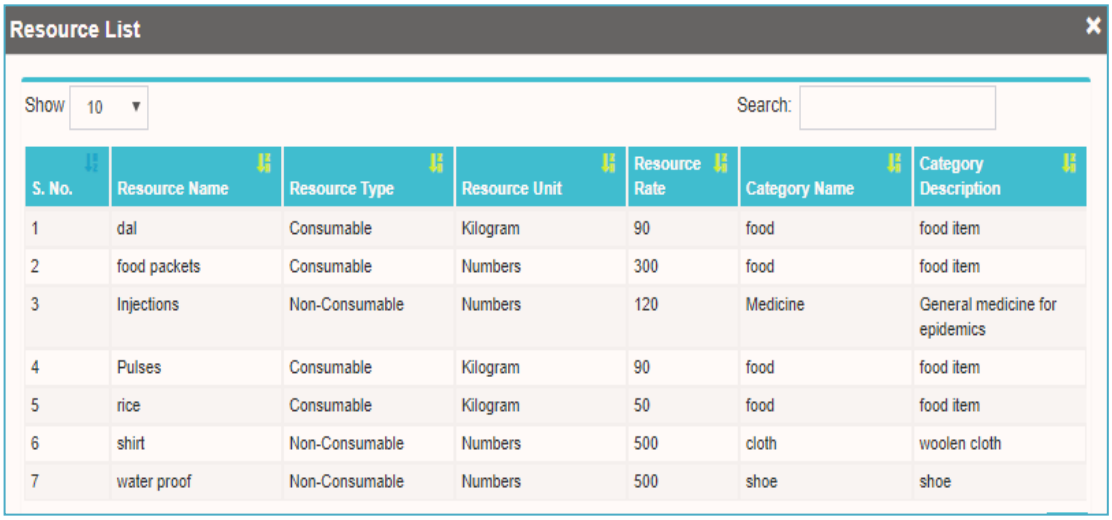


Figure 87 - Available Resources in a State

- **Godown wise resource list:** It gives information of a particular godown in a selected district with the details of available quantity of resources.

☞ Click on **Reports ->Commodities ->Godown wise Resource List ->** a window popups (figure 87)

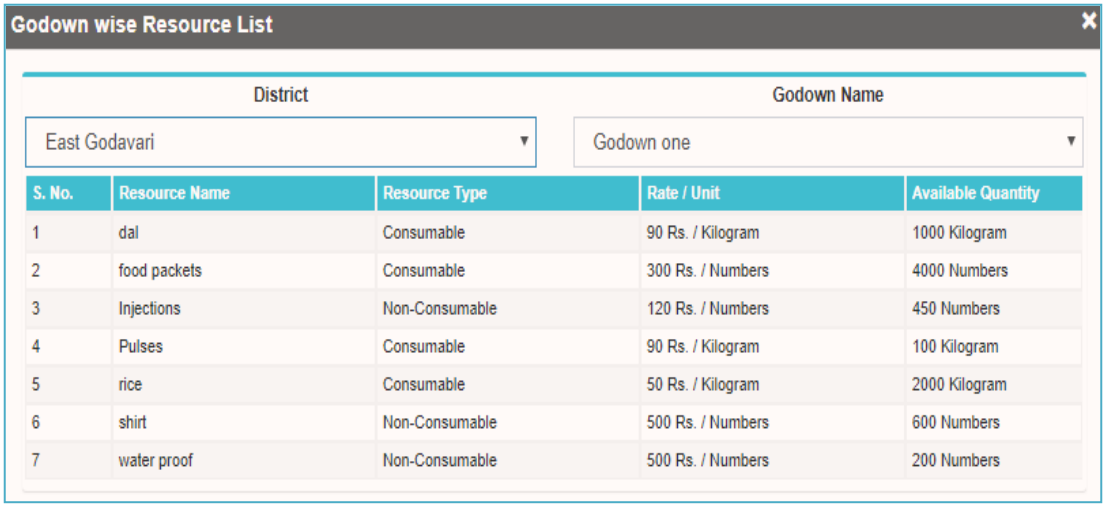


Figure 88 - Available Resources in a Godown

- **Resource availability:** User can view available quantity of a resource in a particular district. It displays the entire godowns list containing selected resource type and available quantity.

☞ Click on **Reports ->Commodities ->Resource Availability ->** a window popups (figure 88)

Figure 89 - Available quantity of a resource in all godowns in a district

3.10.3.3. Allocation & Reallocation

It gives the detailed report about the resources allocated between the godowns.

- **District wise** – It is a report of allocation and reallocations done in a selected district.

☞ Click on Reports ->Allocation & Reallocation ->District wise -> a window popups (figure 89)

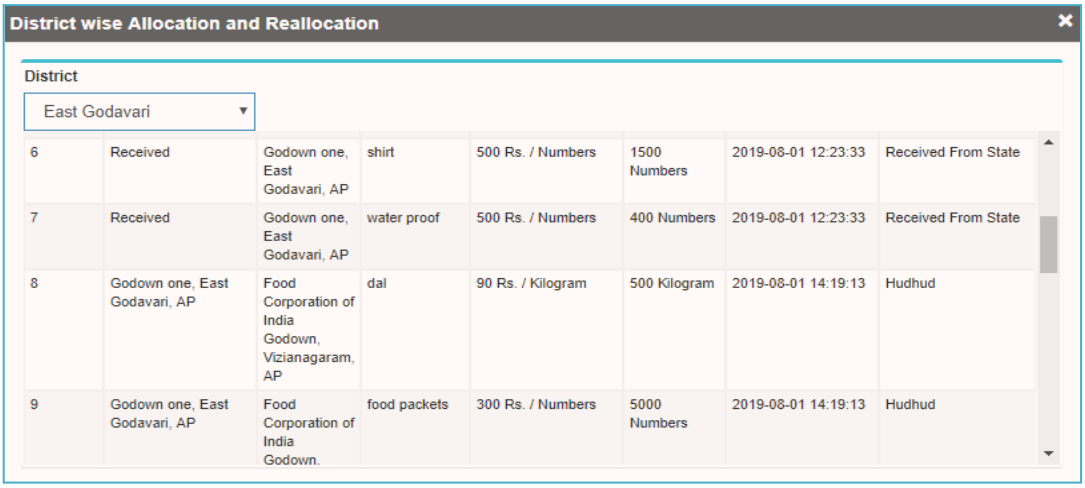


Figure 90 - Allocation & Reallocation of resources done in East Godavari district

- **Godown wise** – It is a report of allocation and reallocations done for a particular godown in a selected district.

☞ Click on **Reports ->Allocation & Reallocation ->Godown wise ->** a window popups (figure 90)

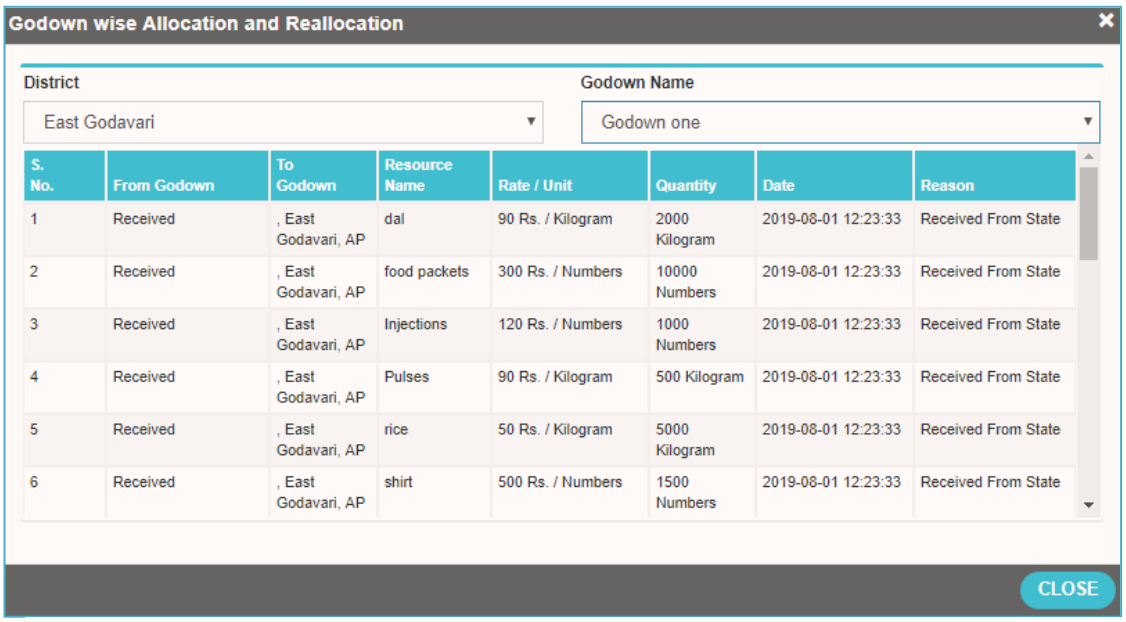


Figure 91 – List if resources in a godown

- **Team wise** – It is a report of resources given to a team for distribution and the goods returned to the godown.

☞ Click on **Reports ->Allocation & Reallocation ->Team wise ->** a window popups (figure 91)

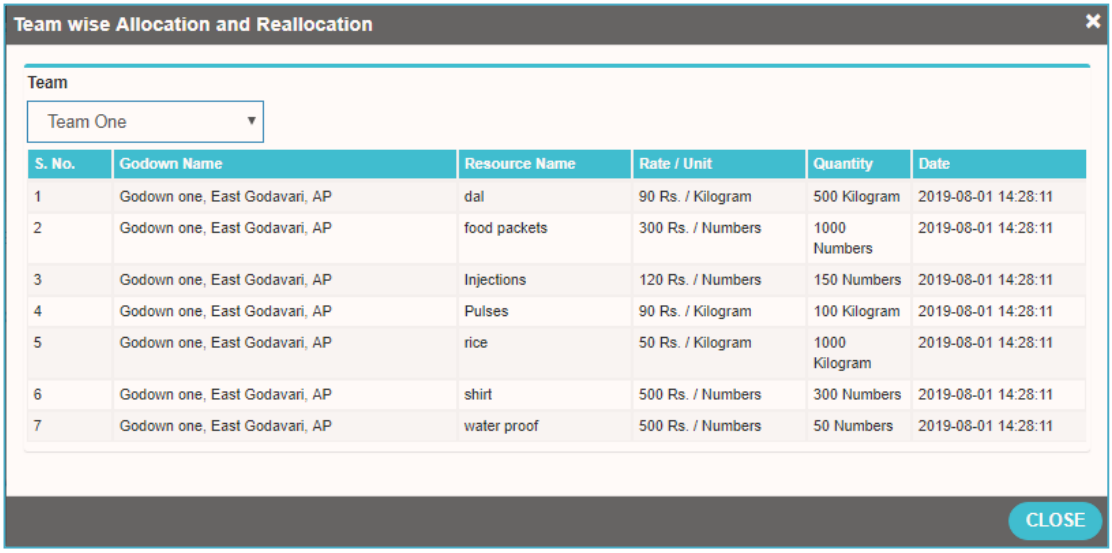


Figure 92 - Distribution of resources to a team

3.11. State Disaster Reports

State wise users can upload their daily rain fall and damage statistics under State Disaster reports tab (Figure 94)

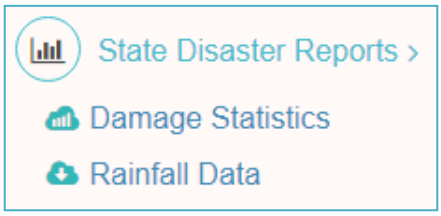


Figure 93: GUI for State Disaster Reports Tab

3.11.1. Damage statistics

By using this tab, Users can add the damage statistics about any disaster occurred in a state.

- ☞ Click on State Disaster Reports -> Damage statistics -> a window popups (figure 93) -> click on **ADD DISASTER DAMAGE STATISTICS** button and a form popups (figure 94)
- ☞ Fill the required fields (District Name, Disaster type Date of Disaster Occurred and affected People etc)
- ☞ Fill the details under all the tabs (Lives & Livestock, Agriculture & Housing, Infrastructure 1, Infrastructure 2 and Helth)
- ☞ Click on **SUBMIT** button to submit the details

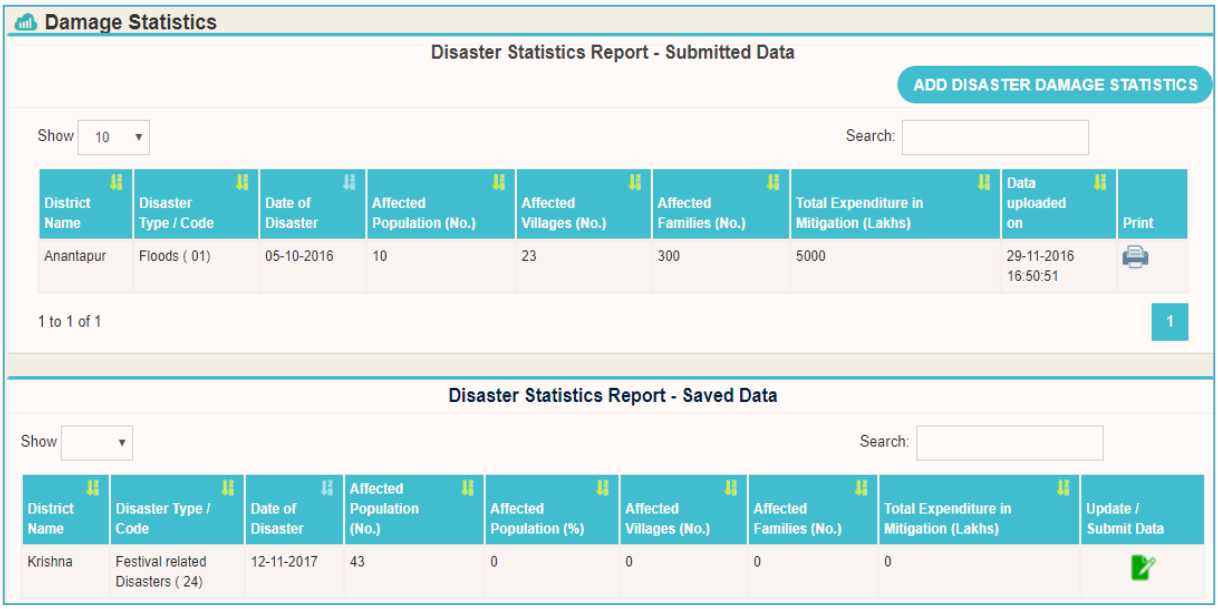


Figure 94 - Disaster Statistics Dashboard

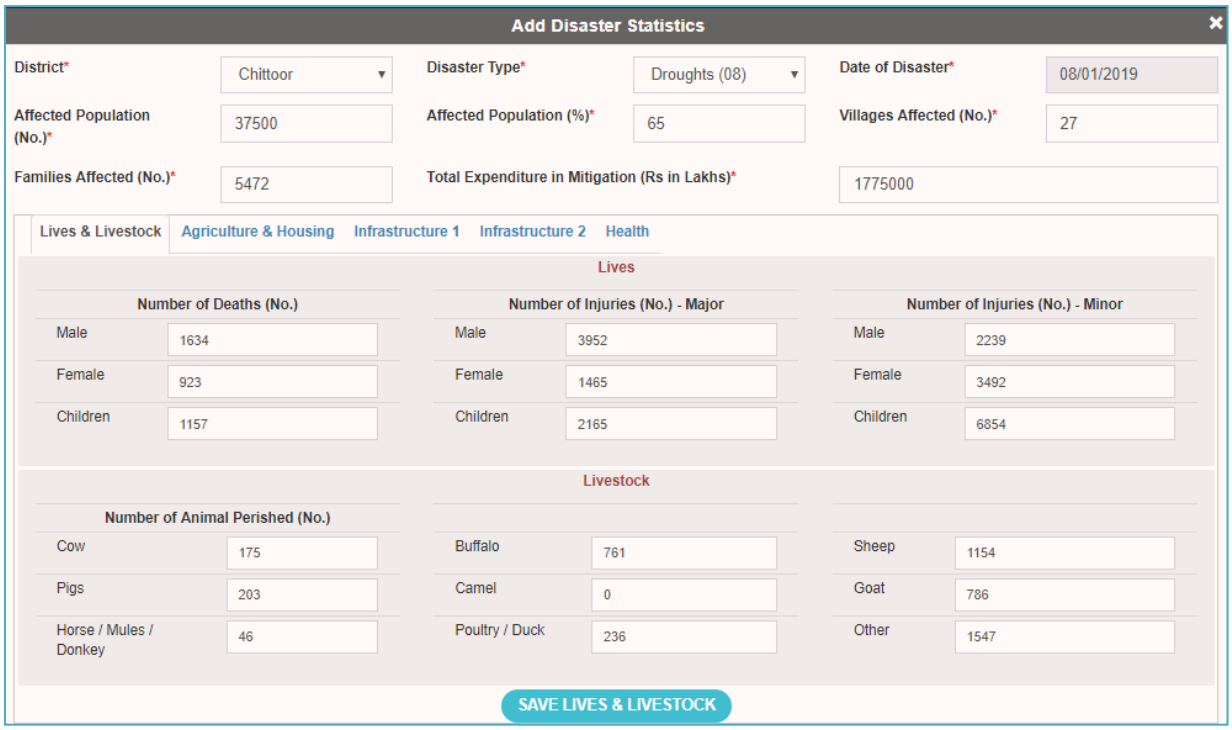


Figure 95 - Input box for Add Disaster Damage Statistics

3.11.2. Rainfall Data

User can upload their State/District daily rainfall data using this module and can be viewd historical statistics.

3.11.2.1. Uploading of Rainfall Data

☞ Click on State Disaster Reports -> **Rainfall Data** -> two separate forms appear

☞ Left form can be used to submit the rainfall statistics (Figure 96) and right-side form will be used to view the submitted/historical rainfall statistics dats.

☞ Select the date and fill the required fields (Rainfall, affected disstricts, No of villages affected, No of population affected etc)

☞ Click on **SUBMIT** button to submit the details

3.11.2.2. Viewing of uploaded rainfall data

- The uploaded rainfall data (till date) can be viewed in right side form as shown in the **Error! Reference source not found.**.
- Users can search the historical data by putting required data in the search bar located top right side of the form

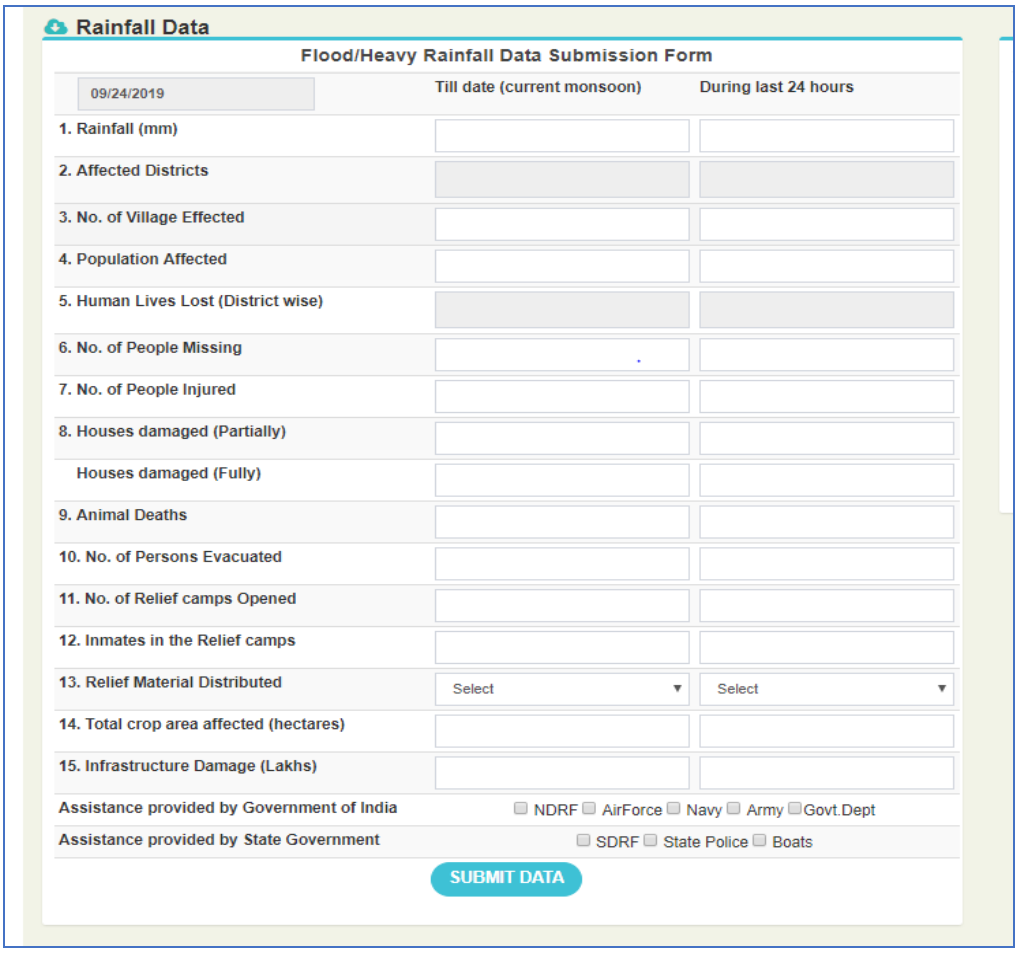


Figure 96: GUI for Rainfall Data Submission form

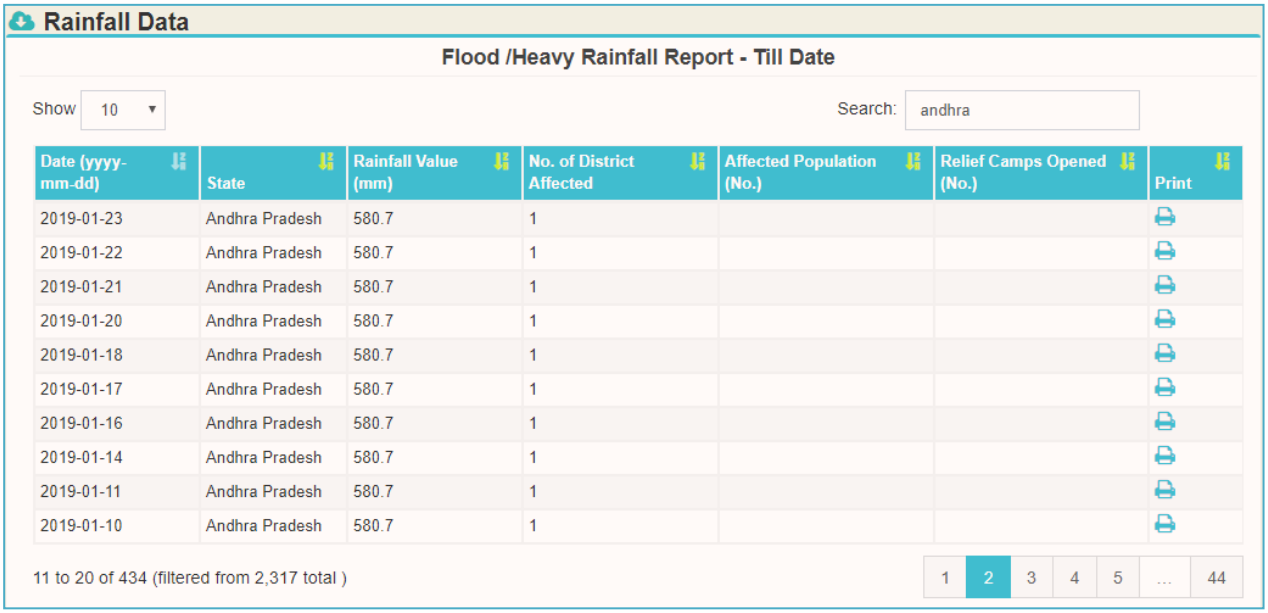


Figure 97: – Historical rain fall data

3.12. Data Repository

Comprehensive outputs of the disaster event in the form of reports and maps are present in this module. In addition to this, it also consists of database from India Disaster Resource Network and Health Databases.

It includes;

1. Downloadable Products
2. IDRN Database
3. Census Database 2011
4. Reports

3.12.1. Downloadable Products

User can download the disaster specific maps and reports uploaded during the disasters; these reports contain Geo-PDF, PDF and XLS documents etc.

☞ Click on **Data Repository -> Downloadable Products ->** List the all available maps and reports in right side

☞ By Clicking on map or report button, Users can view or download the any map or report corresponding to any event

☞ Users can filter the reports by selecting Disaster type or year and also by searching with any keyword (search bar is provided top right side)

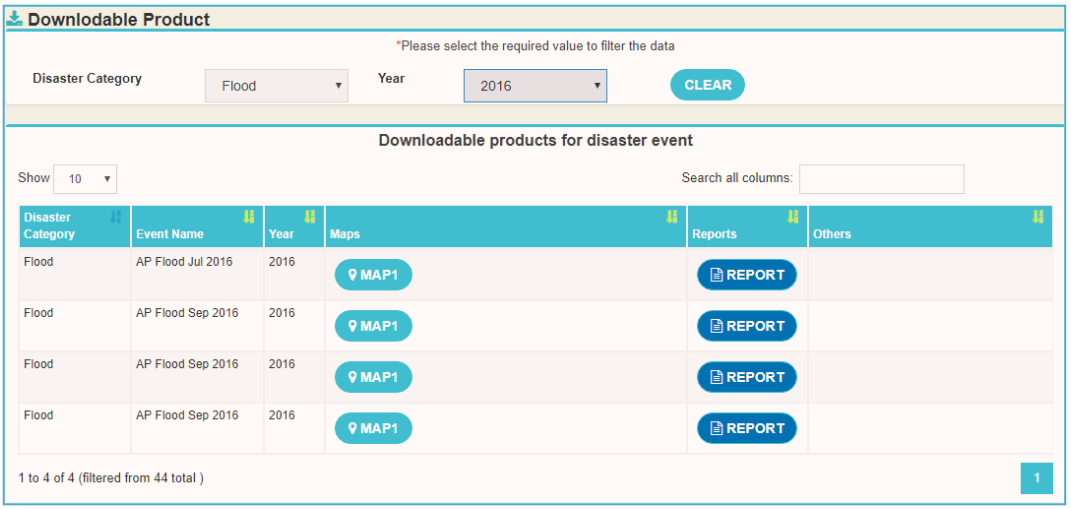
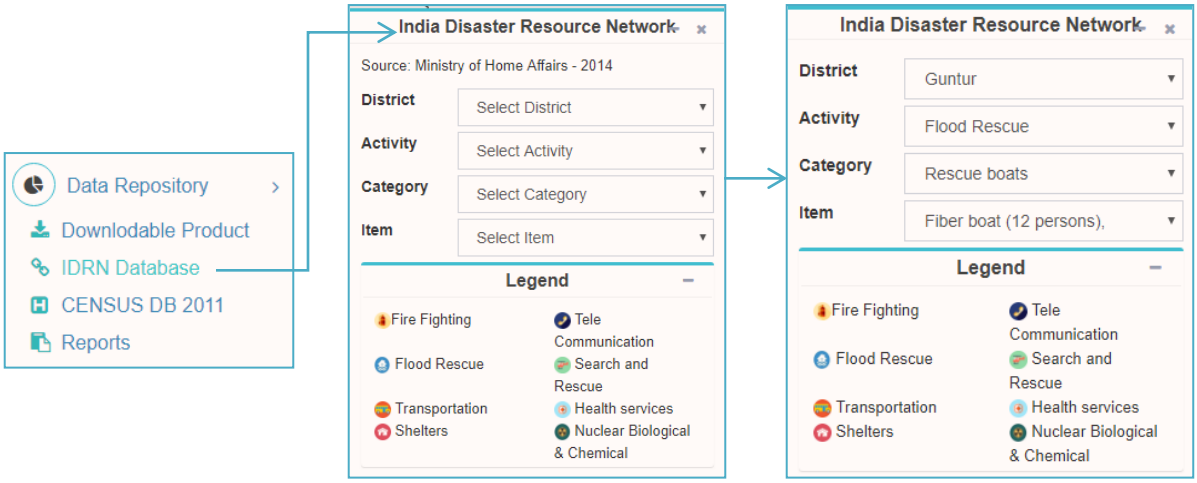


Figure 98 - GUI for downloadable products of a state

It is Inventory of resources that enlists equipment and human resources, collated from districts, states and national level line departments and agencies.

> ☞ Click Data repository > IDRN database > go to IDRN window > select District > select Activity > select Category > slect Item > IDRN results window



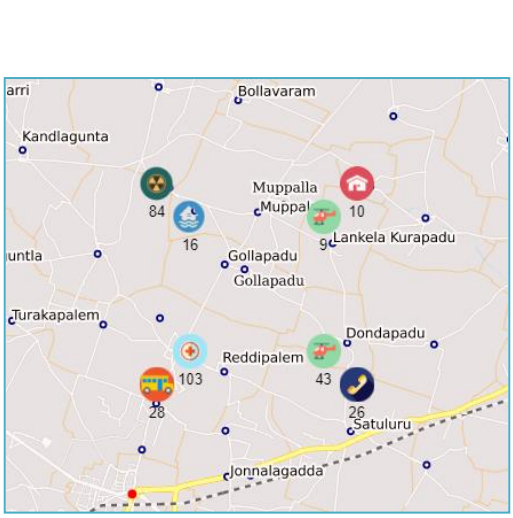


Figure 100: Location of available resources equipment

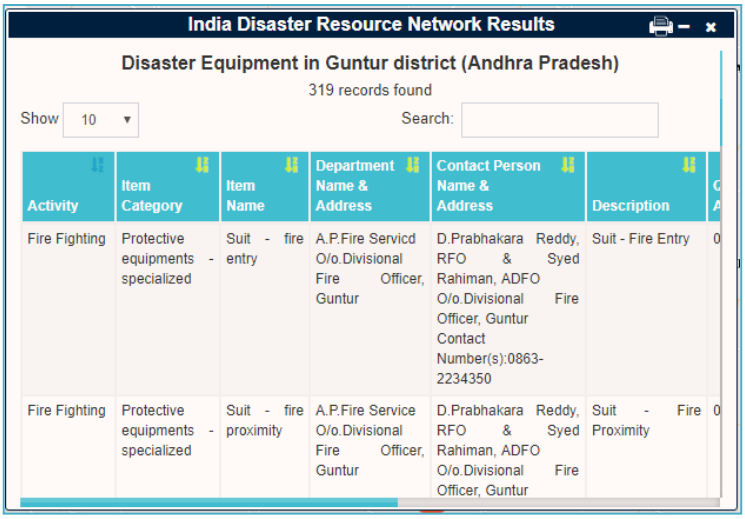


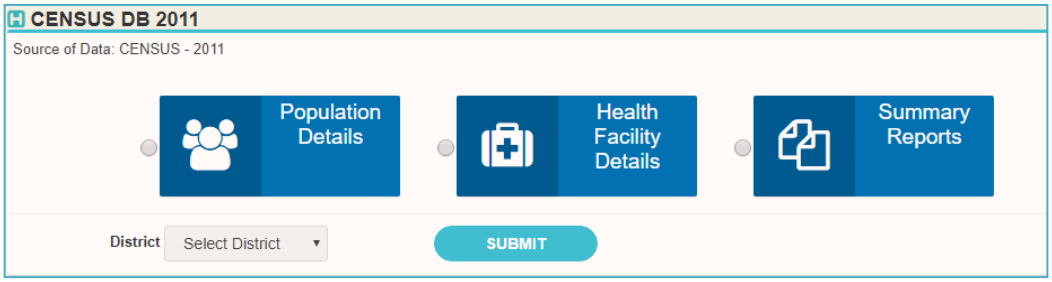
Figure 99: – Details of each resourc equipment

On using Feature Information tool on these facilities user will get to know the identity of the each facility and contact details.

3.12.3. Census Database – 2011

This module contains Census reports for all the states at district level and district health facilities with contact details.

☞ Click Data Repository > Census DB 2011 > *mark* Population details/Health facility details/Summary reports > *select* District > *click* Submit



Visakhapatnam District Population Details

No. of People		No. of People b/w 0 to 6 yrs		No. of Literates	
Male	1903894	Male	231675	Male	1151086
Female	1885929	Female	225379	Female	81123
Total People	3789823	Total People	457054	Total People	1981214
No. of Rural People		**No. of Rural People b/w 0 to 6 yrs**		**No. of Rural Literates**	
Male	1138827	Male	150431	Male	580399
Female	1139156	Female	147138	Female	401393
Total People	2277983	Total People	297569	Total People	945290
No. of Urban People		**No. of Urban People b/w 0 to 6 yrs**		**No. of Urban Literates**	
Male	765067	Male	81244	Male	570687
Female	746773	Female	78241	Female	281560
Total People	1511840	Total People	159485	Total People	1035924

Figure 101- District level population details

Visakhapatnam District Health Facility Contact Detail

Show 10 Search:

Health Facility Type	Health Facility Name	Address	Contact Detail
Community Health Centers	KOTAURATLA (Community Health Centre)		
Community Health Centers	KINTHARELU (Community Health Centre)		
Community Health Centers	INJARI (Community Health Centre)		
Community Health Centers	DARELI (Community Health Centre)		
Community Health Centers	CHODAVARAM (Community Health Centre)		
Community Health Centers	BAYYAVARAM (Community Health Centre)		
Dental College -UG only	Gitam Dental College	Gandhinagar Campus Rushi Konda NA - 530045	NA NA NA
Dispensaries	Sri Samba Murthy Nagar Dispensary (Deptt. of Shipping, Visakhapatnam Port Trust)	Sri Samba Murthy Nagar Housing Colony Kancharapalem NA - 530008	NA NA NA
Dispensaries	Health Centre-II (Ministry of Steel, Rashtriya Ispat Nigam Ltd)	Sector-2 Visakhapatnam Steel Plant Ukkunagaram - NA	NA NA NA
Dispensaries	Salagramapuram Dispensary (Deptt. of Shipping)	Salagramapuram Housing Colony Salagramapuram NA - 530024	NA NA NA

11 to 20 of 997 1 2 3 4 5 ... 100

Figure 102 - District level health facility contact details

3.12.4. Reports

This module gives the graphical representations for the layers statistics (category wise) for a given State (Figure 104).

☞ Click on Data Repository -> **Reports**

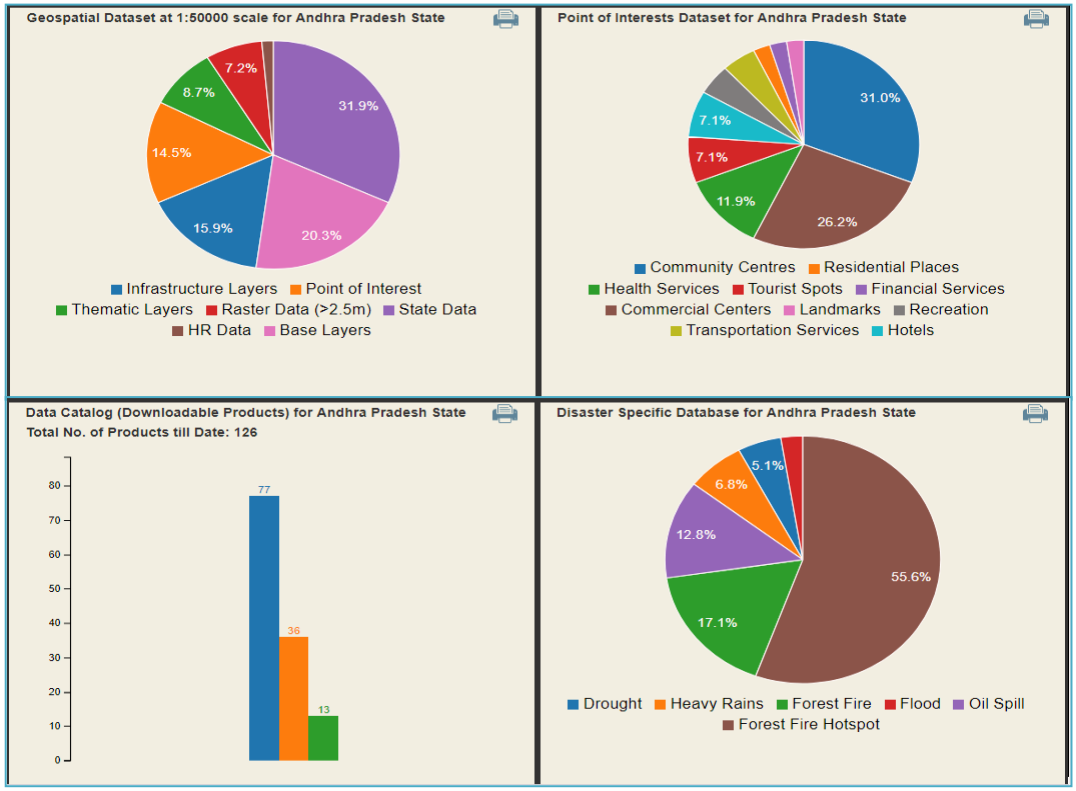


Figure 103 - Statistics of available datasets

3.13. Data Inventory

It is an Index of the portal; it holds the brief information and location of the data products that are available in each category.

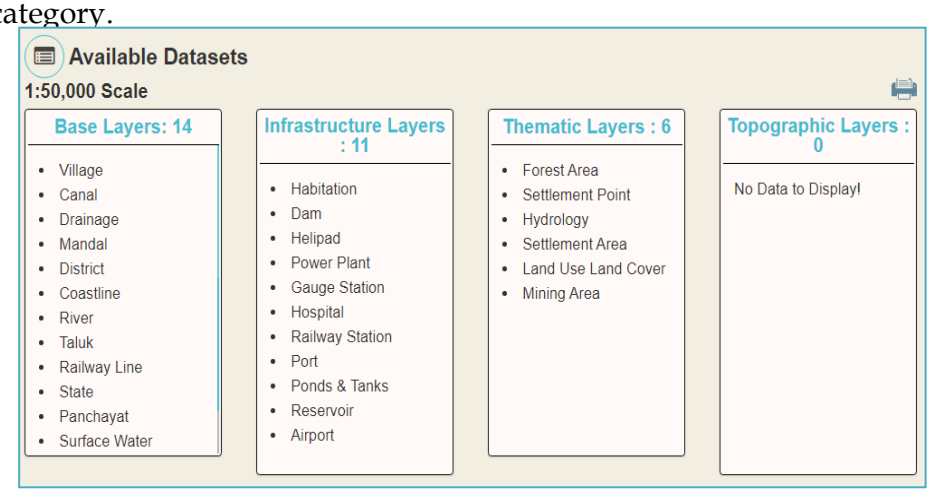


Figure 104 - Available data sets at 1:50K scale module

3.14. Feedback

User's valuable feedback is very helpful to NDEM for improving the performance and developing new modules.

- ☞ Go to the Feedback in the menu, click on it.
- ☞ Check the mandatory fields which are highlighted by * mark.
- ☞ Then mark the choices for each question.
- ☞ If any suggestions are there, user can enter in the text box given below to it.
- ☞ Click on **submit** button to submit the feedback

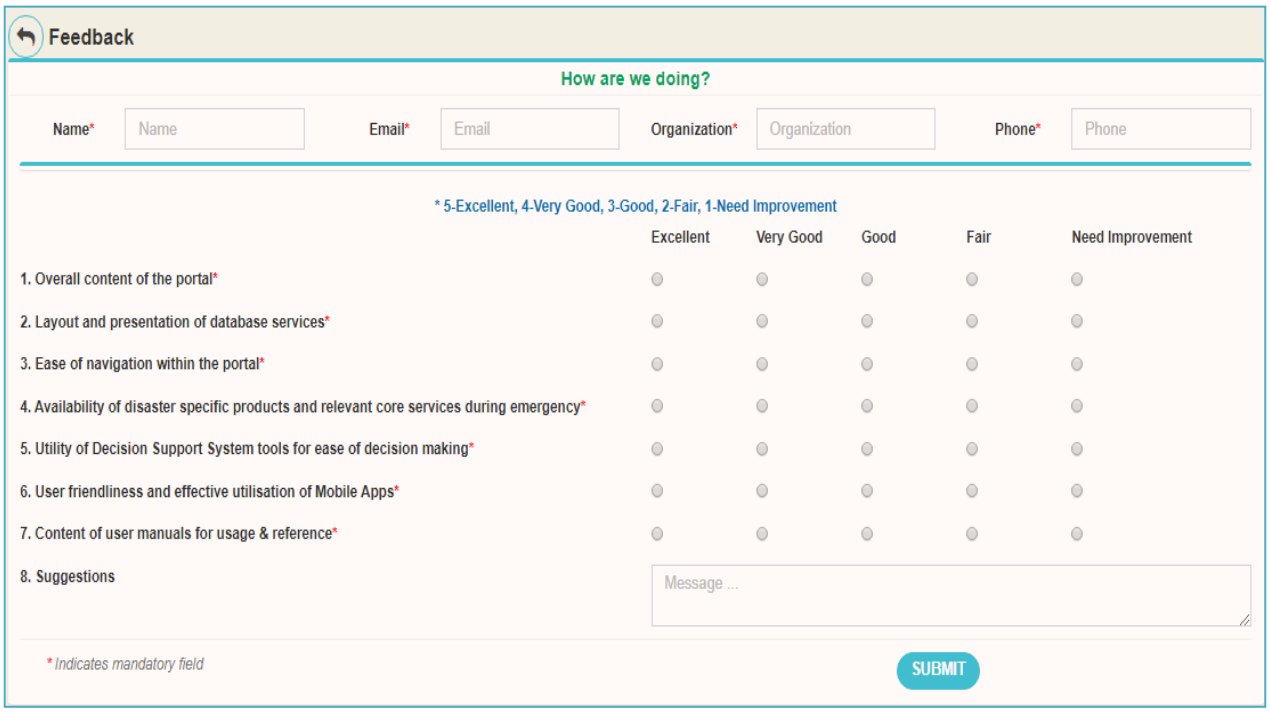


Figure 105 – Feedback form

4. Mobile Applications

Mobile technologies are transforming the ways people seek, receive and share information. With the evolution of smartphones and tablets, mobile apps influenced the day to day activities. Similarly Mobile Apps plays a significant role in disaster management starting from reporting an incident to seeking of information from field. The use of mobile applications in disaster/emergency management has greatly improved relief operations due to the leading advances in telecommunication, Remote Sensing and GIS techniques.

For support in disaster/emergency management activities, the mobile application titled "**NDEM**" is developed and the link to download the apk is provided in NDEM Home page under 'DOWNLOAD MOBILE APPS' section.

☞ Goto **DOWNLOAD MOBILE APPS** Section -> click on '**NDEM**' on the Home page

4.1. Specifications for Mobile Apps

- **Platform:** Currently this application is developed for android platform
- **Android Version**: It work for android 5.0 or higher
- **Internet Connection**: Mobile should have an active internet connection
- **GPS:** Mobile should be equipped with GPS facility to tag the incidents
- **Camera**: High Resolution camera for taking field photos

4.2. Installing Mobile Apps

After downloading apk , click /tap on the downloaded apk to install the application as shown in the Figure 107.

After completion of installing application open the app from the local storage

For first time opening application, allow the following key permissions for smooth functioning of the application (Figure 108)

- **Location** : for accessing current location and auto filling of geo-location In the application forms
- **Taking pictures and Record vedio**: for recording Phostos and vedio while in any incident
- **Send and View SMS: For sending and viewing sms**
- **Allow Media (Photos and files)**: To send photos from local gallery.

NDEM Mobile Application is made available in bilingual (English and Hindi) for ease of access and operations. After successful opening of the application the GUI looks like as shown in the Figure110. User can switch between English and Hindi by clicking on the respective button place at top right-side of the application.

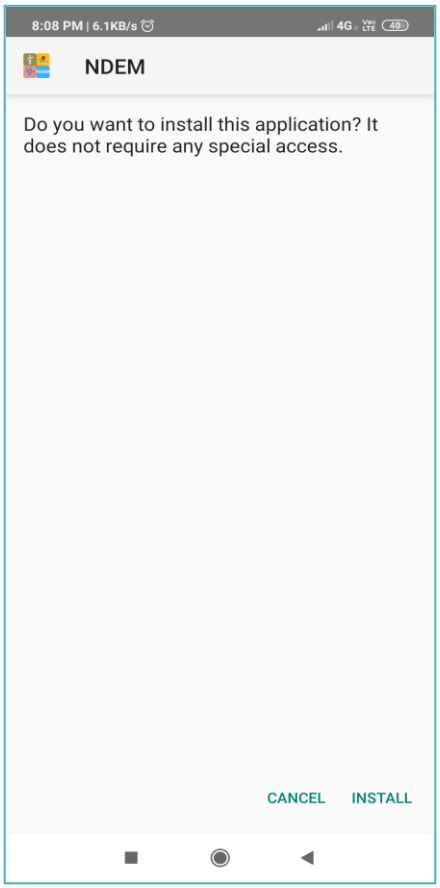


Figure 106 Installing of Mobile App

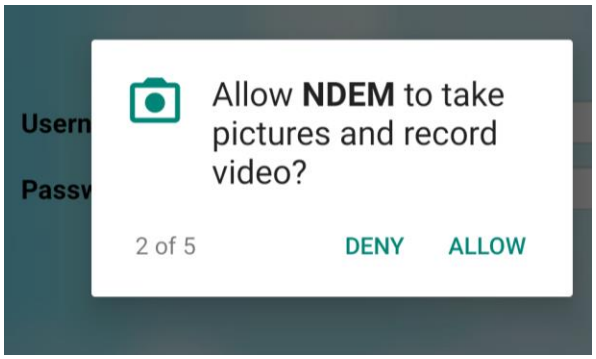


Figure 107: Permissions For Mobile Applications

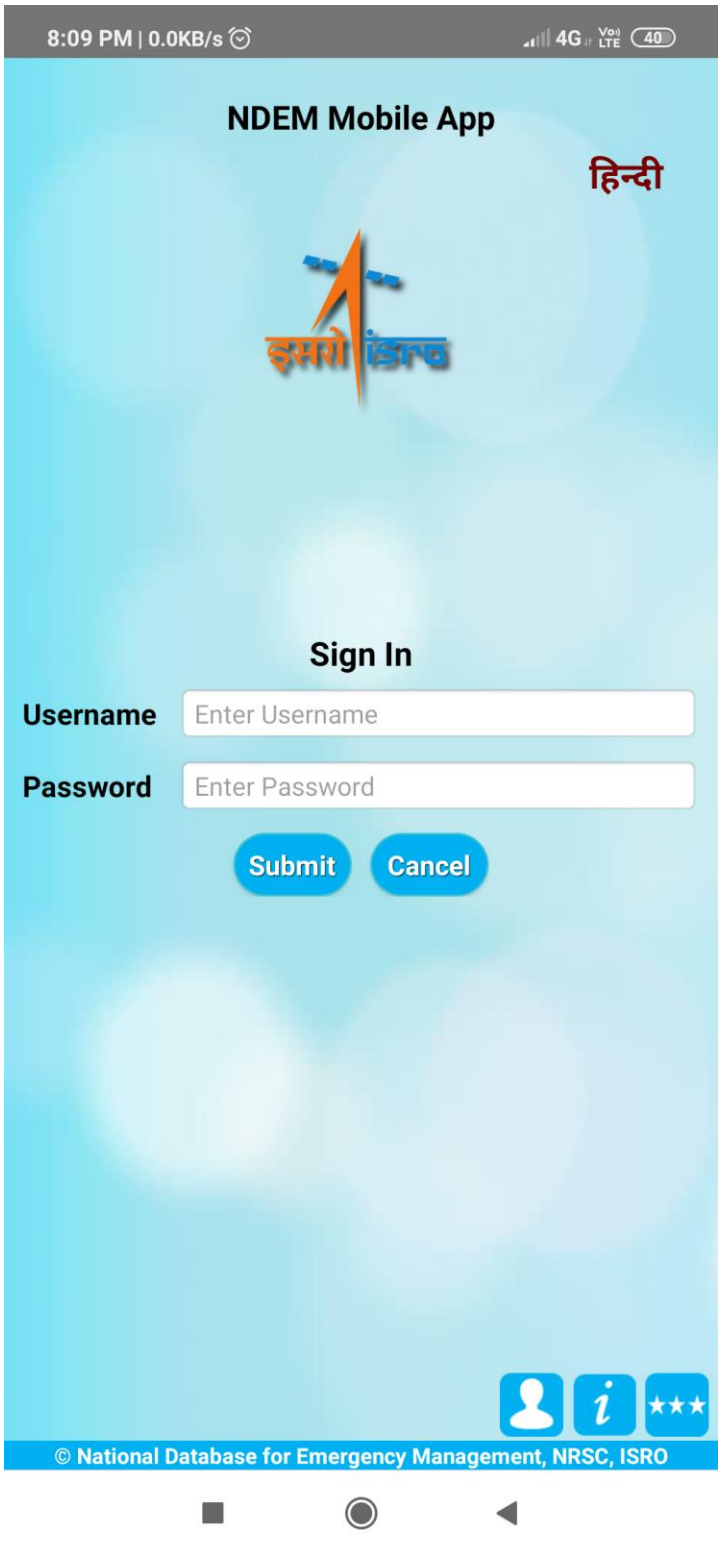


Figure108: Mobile App GUI in English

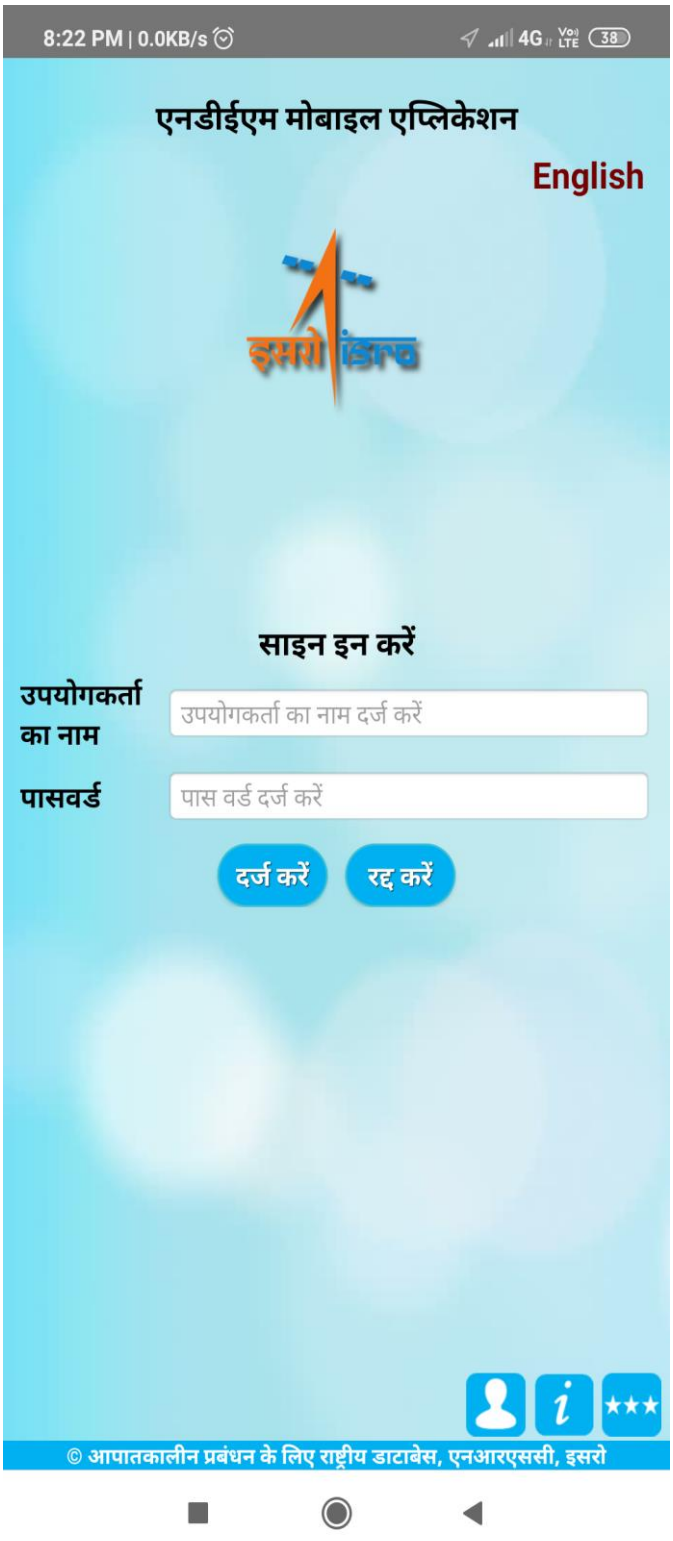


Figure109: Mobile App GUI in Hindi

4.3. Functions of Mobile App

For using the NDEM Mobile Application the user needs the login credentials. These credentials are the same as the NDEM Portal credentials. (For user credentials and accessing please refer section 1.4). Provide the user name and password and click on **Submit** button to proceed inside of the application. The NDEM Mobile App is equipped with the following modules

- **Incident Reporting-** to report any disaster incident
- **Relief Management-** to seek help and send report to authorities
- **Geo-Spatial Data Collection-** Spatial data collection
- **Geo-Tagging- Emergency facilities tagging**

Figure 110: GUI for Modules of Mobile Application

4.3.1. Incident Reporting

Any relief & rescue operations start from the incident reporting followed by the communication to the respective authorities, analysis of the magnitude of the event etc. Incident can be reported by State / NDRF official through mobile application or NDEM portal. The purpose of the incident report module is to intimate the geo-location of the incident along with other details of incident such as time, place of occurrence, etc., to the authorized officials for taking immediate actions. Once incident is reported, SMS would be delivered to concerned Battalion head and to Headquarters. The received incident appears in Blue colour on the map. Battalion has to forward the incident to Headquarter for further approval. After receiving forwarded incident, Headquarter can visualize the incident details in NDEM geoportal. The forwarded incident appears in Green colour on the map. Once the incident is approved, the Incident icon color changes to Red.

4.3.1.1. Reporting of an incident

☞ Click on Report Incident Module and the GUI will be shown as in Figure 111.

☞ Fill the required fields

- Enter Latitude and Longitude of incident location. (If GPS is enabled, the coordinates will be auto-filled)
- Select time and date of incident
- Enter Reporter name, Mobile Number and brief description about the incident (ex: fire accident, building collapse and landslide etc.)
- Take incident pictures by clicking on camera icon.
- Click on **submit** button report the incident

Figure 111: GUI for Incident Reporting

4.3.2. Relief Management

Relief refers to the provision of essential, appropriate and timely humanitarian support to those affected by a disaster/emergency.

☞	Click on **Relief Management** module
☞	Emergency call module has the following sub modules

- **Distress call**
- **Emergecny Call**
- **First Information Report**
- **Summary**

Figure112: GUI for sub modules of Relief Management

4.3.2.1. Distress call

It is a call to authority notifying them a person requiring an emergency.

- ☞ Click on Distress Calls
- ☞ Enter Latitude and Longitude (If GPS is enabled latitude and longitudes are filled automatically)
- ☞ Click on submit to submit the distress call

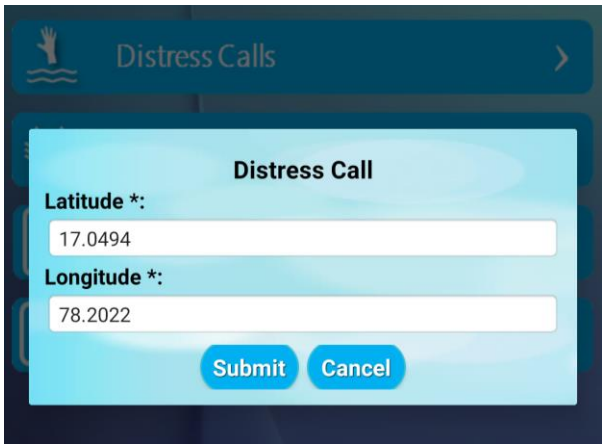


Figure 113: Sending a Distress call

4.3.2.2. Emergency Call

It is call to seek help (Food, Water & medical help) from authorities in an emergency situation.

- ☞ Click on Emergency Call
- ☞ Enter Latitude and Longitude (if GPS enabled latitude and longitudes are filled automatically)
- ☞ Select the Requirement from the drop down list (Ex: Food&water, Shelter, Mediacal Assistance and Transportation etc.)
- ☞ Click on **submit** button to submit the call

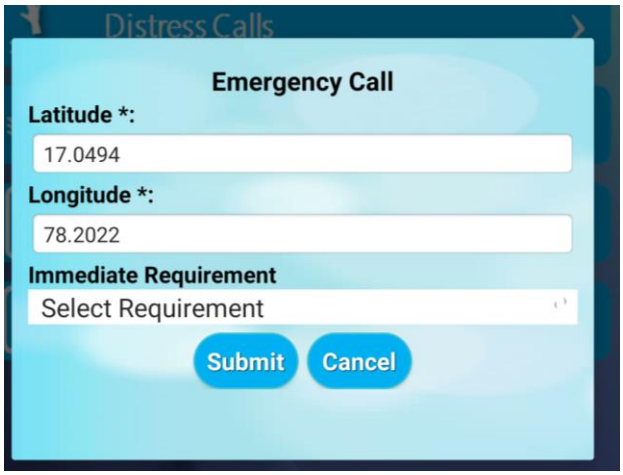


Figure 114: Sending an Emergency Call

User can view the submitted Distress and Emergency call by clicking on icon

Call summary is as shown in the Figure 116.

Figure 115: Call Summary List

4.3.2.3. First Information Report (FIR)

First Information Report (FIR) is detailed report about the disaster incident along with field photographs to be sent to the authorities.

- ☞ Click on First Information Report (FIR) module
- ☞ Select the required details like disaster type, Situation, Extent of Damage, Life Loss and Local Rescue help from their respective drop down lists
- ☞ Enter the Reporter Name and Mobile Number
- ☞ Select/Take the photos of incident intwo ways 1) click on camera to take the pictures from the mobile or 2) select the images from the local gallery by clicking on the icon (Note : User can select at a time 10 photos or uto 1mb size from the local gallery)
- ☞ Click on submit to send the First Information Report (FIR)

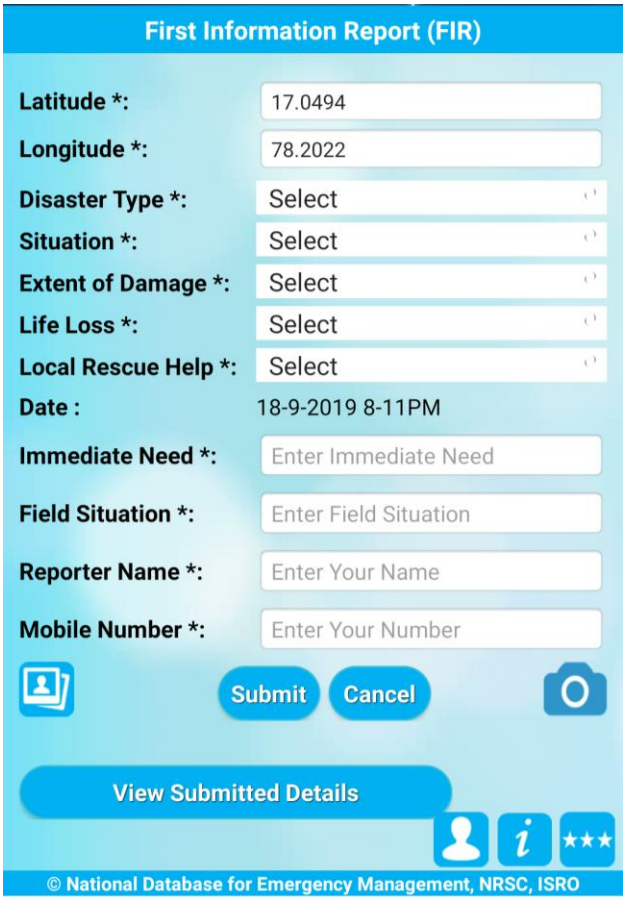


Figure 117: First Information Report

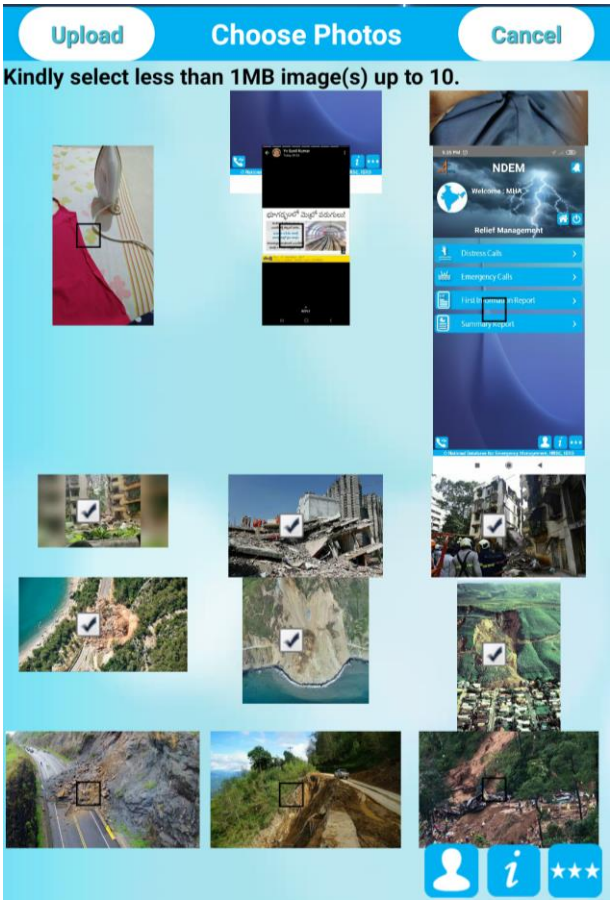


Figure 116: Attaching multiple images from local gallery

View Submitted FIRs

☞ Click on '**View Submitted Details**' button (figure 102) to visualize the FIR reports sent from the device with particular username as shown in Figure 118.

Figure 118: Submitted FIR

4.3.2.4. Summary Report

Summary report is used to send quantitative report of the disaster situation along with field photographs and location coordinates in a specified format

☞ Click on "Summary Report" button.

☞ If GPS/location is enabled, geo-coordinates are fetched automatically.

☞ Enter details such Number of people in relief camps, people affected, people yet to be rescued etc., and click on "Submit" button to send summary report (figure 3.8).

☞ Field photographs can be attach by clicking on camera button. User can send multiple images from Gallery as well.

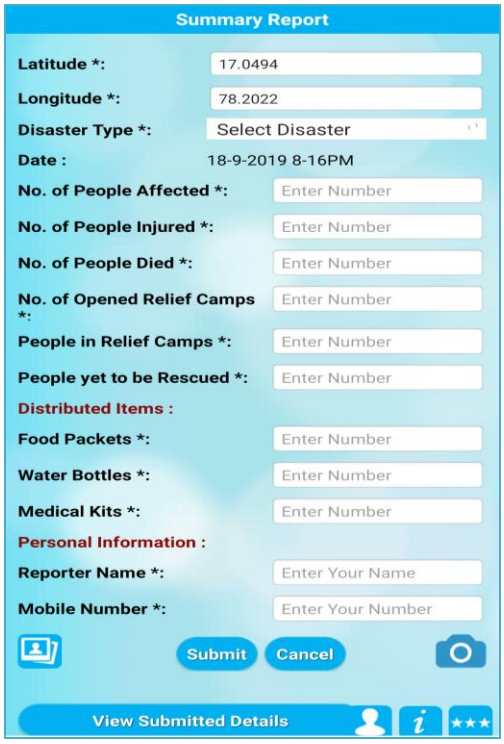


Figure 119: GUI for Summary Report

☞ Click on '**View Submitted Details**' button to visualize the **Summary Report** reports that sent from the device with particular username

4.3.3. Geo-Spatial Data Collection

By using this module users can geo-tag the emergency facilities like hospitals, relief shelters and medical facilities etc along with photographs in near real time.

☞	Click Geo-Spatial Data Collection module -> Form will appear
☞	Fill the required fields with the respective data
☞	User can attach photos by either using camera icon or from local gallery
☞	Click on **submit** button to submit the details

Figure 120: Geo Spatial data collection GUI

4.3.4. Geo-tagging

Geo tagging of emergency facilities using online maps can be done using this module.

- ☞ Click on Geo-tagging module
- ☞ Click anywhere on the map to add the facility. Green color point will be displayed.
- ☞ Click on add icon placed at bottom-left side and new form will be appear
- ☞ Fill the required fields and attaché camera image
- ☞ Click on submit button to add the facility on the map
- ☞ Facility will be added and displayed on the map in yellow color point

User can search already added features from data base by using provided by search option top left side.

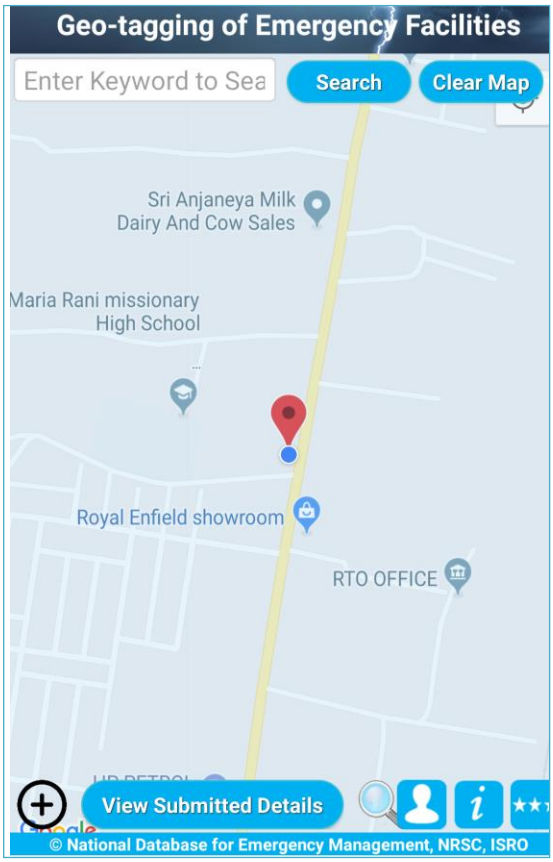


Figure 122: Geo-Tagging of Emergency facility

Figure 121: Form for Entering Details of facility

4.3.4.1. Finding features around point (Proximity)

☞ Click on icon a form will appear as shown in the Figure 124.

☞ Fill the required fields like latitude, longitude, facility type and buffer distance

☞ Click on Search button to display the features on the map

Figure 123: Performing Proximity around a point

4.3.5. Other Features

☞ The '**Relief Management'** and **'Geospatial data Collection'** modules can also work in offline mode. User can save the collected data locally and can sent saved data whenever the in online.

☞ Click on home icon to go back to home location of modules

☞ Click on to logout any time from mobile application

☞ Click on bell icon to view the notifications

☞ Click on icon to see the '**Contact Us'** details

☞ Click on icon to see descriptuion about the respective module

☞ Click on ion to give the feed back

Annexure-I

Request for User name and Password to access the NDEM Portal

-

State Name:

Details of the official to be authorized for accessing

1.	Name	
2.	Designation	
3.	Organization	
4.	Address	
5.	Email-id	
6.	Phone no	
7.	Mobile no*	
8.	Fax no.	

* Mobile number for receiving OTP (One Time Password)

(*Signature of the official*)

Details of the officer authorizing the official

1.	Name	
2.	Designation	
3.	Organization	
4.	Address	
5.	Email-id	
6.	Phone no	
7.	Mobile no	
8.	Fax no.	

I hereby certify that the above mentioned official is a permanent Government employee and he is authorized for obtaining the User name, Password for accessing the products hosted on the NDEM website.

The data/products accessed/downloaded will be used for official usage only. Necessary precautions will be taken for safety and security of the data as per the Government of India guidelines. It is also certified that the User name and Password will be kept confidential.

(*Signature of the competent authority with seal*)
(* Not below the rank of the Secretary, DM/Commissioner)

NATIONAL DATABASE FOR EMERGENCY MANAGEMEBNT,
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