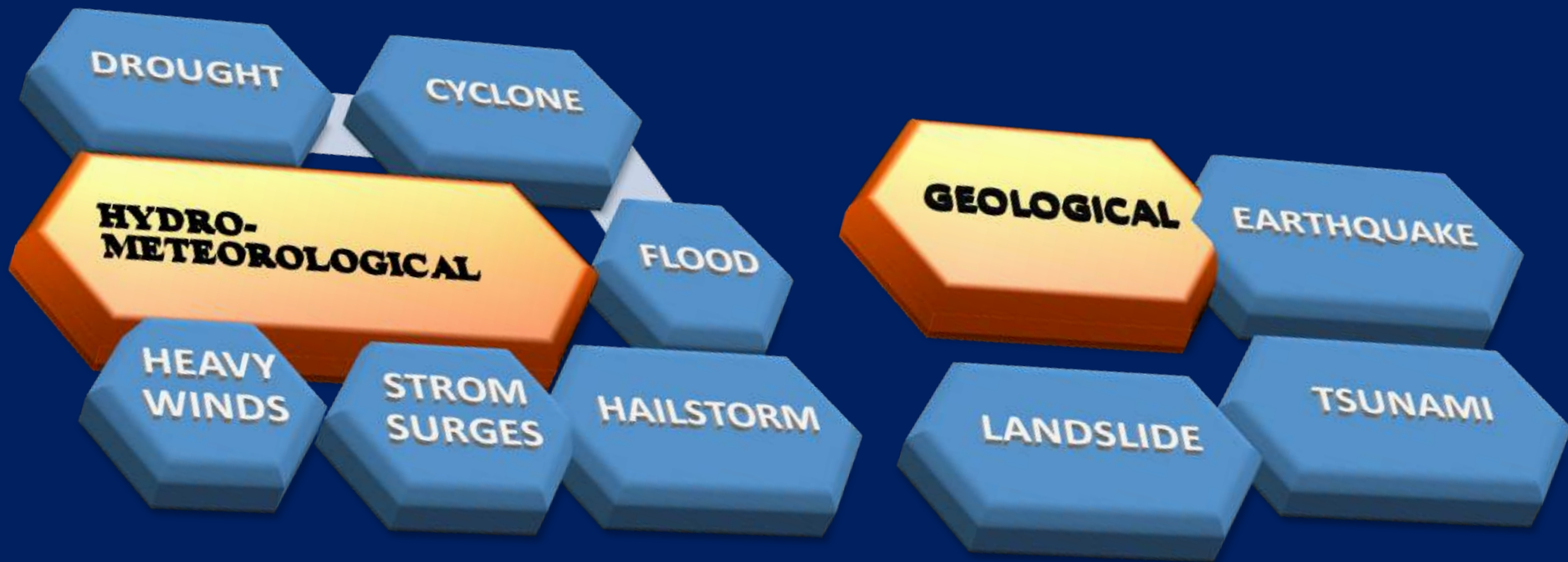


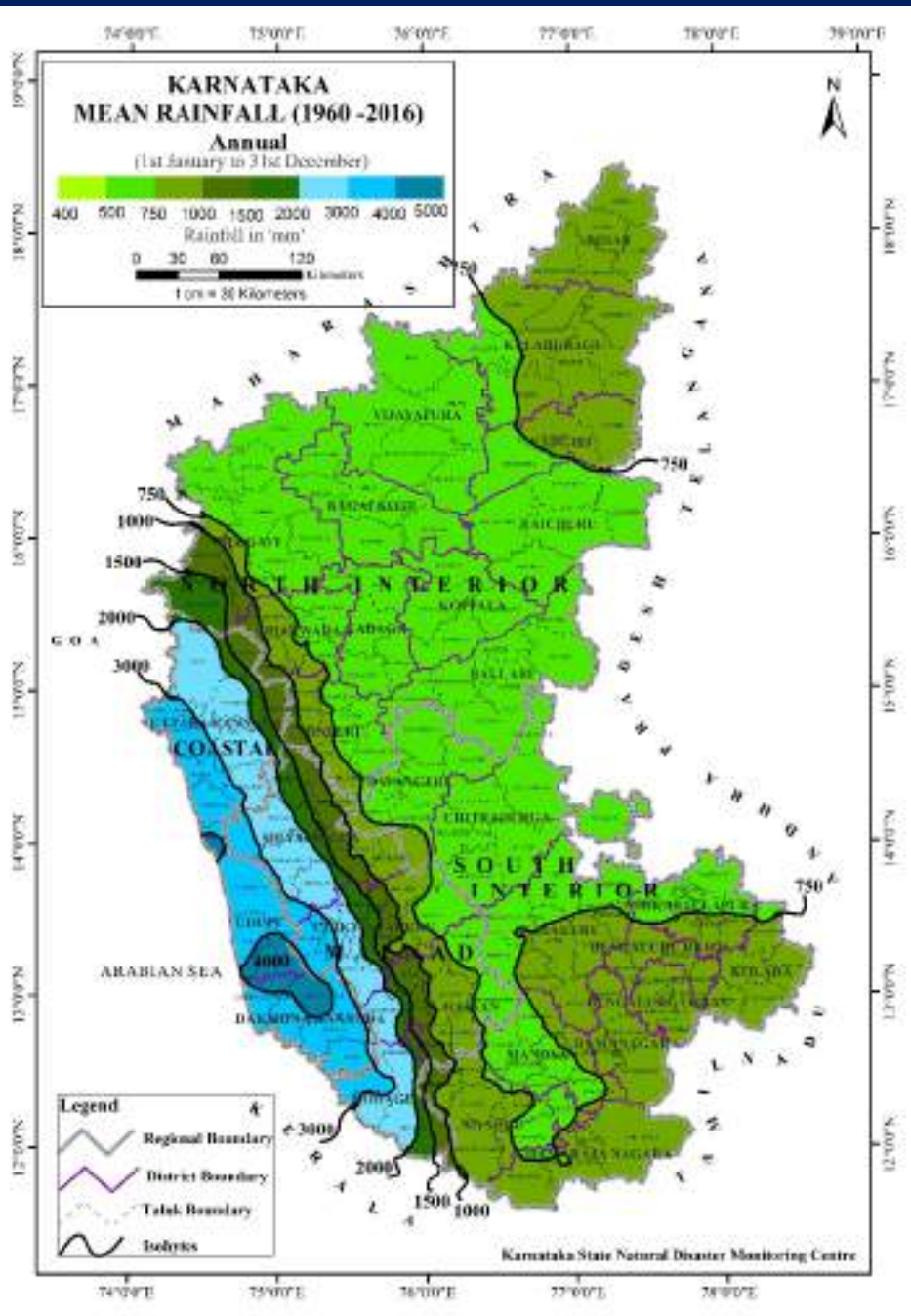
# Multi-Hazard Early Warning System in Karnataka-India

Dr. G S Srinivasa Reddy  
Director, KSNDMC  
[dmc.kar@gmail.com](mailto:dmc.kar@gmail.com)

Karnataka State Natural Disaster Monitoring Centre (KSNDMC)  
[www.ksndmc.org](http://www.ksndmc.org)

# Karnataka State is vulnerable to Hydro-Meteorological & Geological Hazards





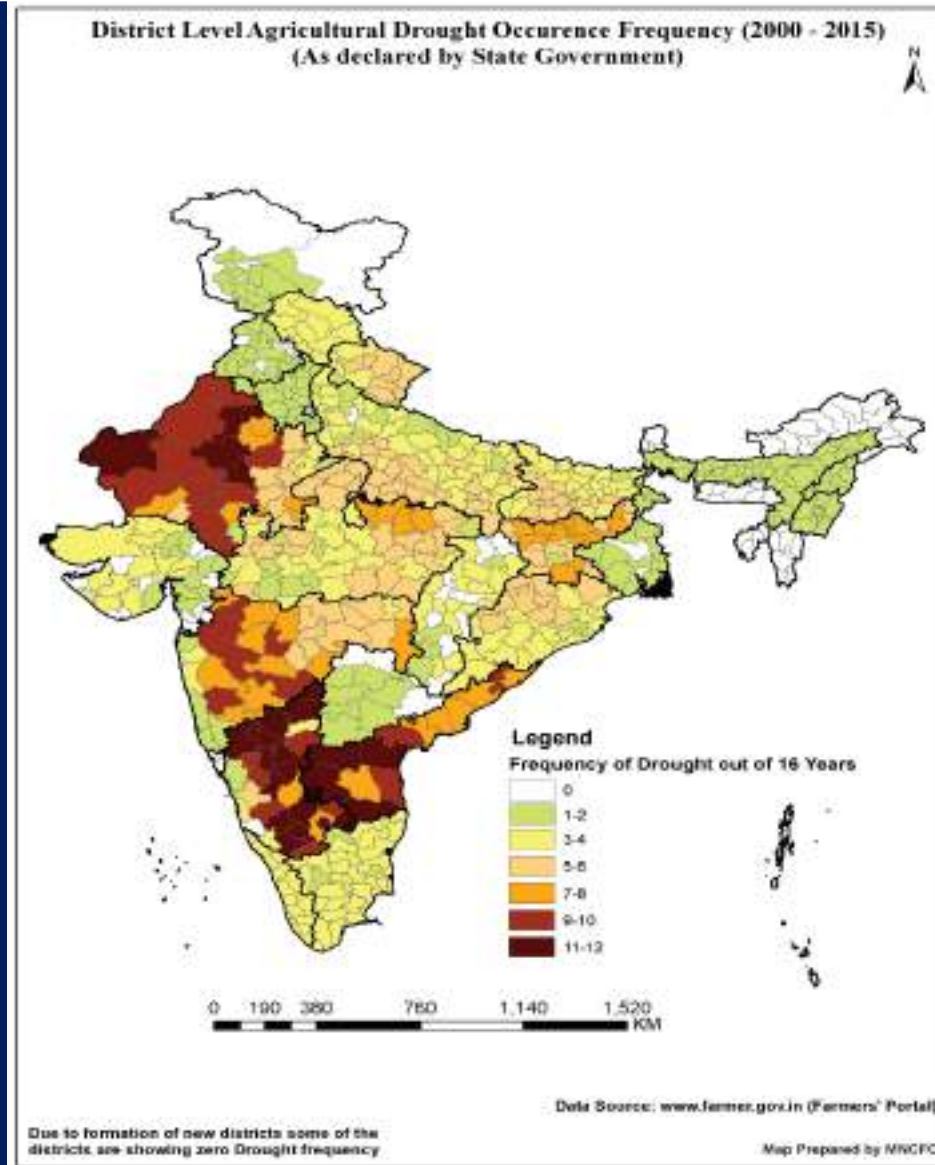
> 70% of Normal Annual Rainfall occurs during SW Monsoon Season

Spatial Rainfall distribution varies between ~5,000mm – 500mm

Hydro-Meteorological Hazards are recurring very frequently and with increased intensity, due to variations in the strength of the SW Monsoon and distribution of rainfall

# Drought

## Frequency of Occurrence of Drought (2000-2015)



# Floods-2018



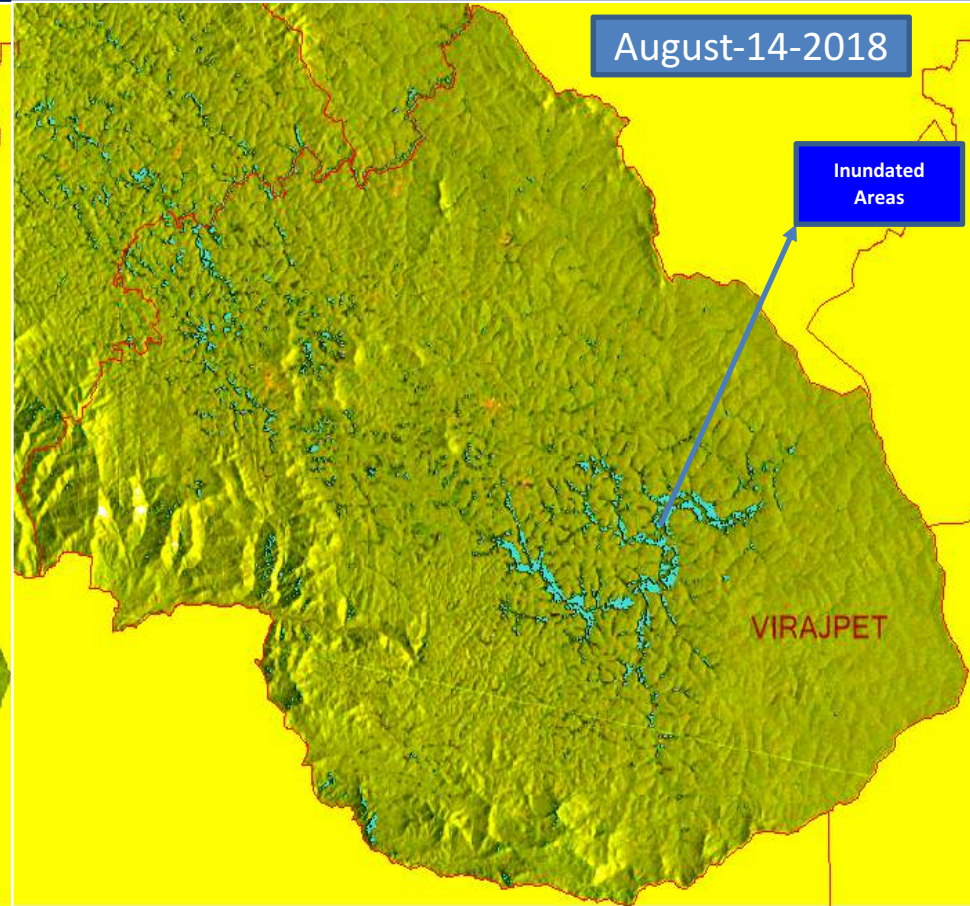
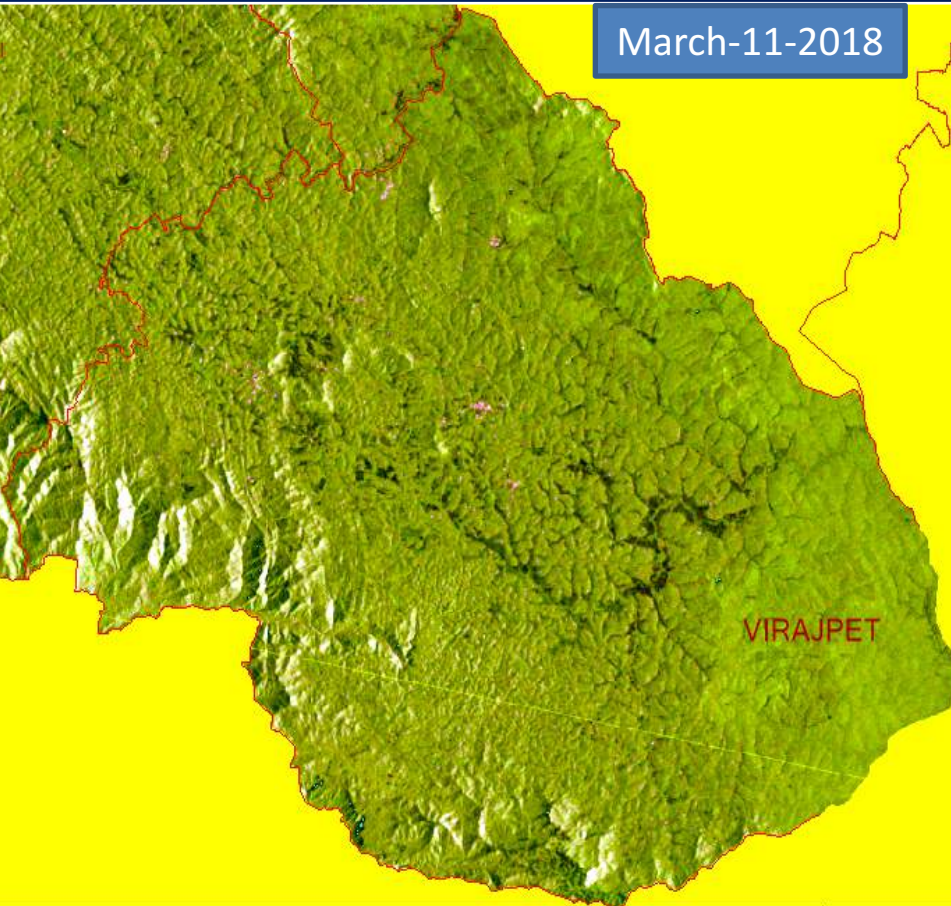
Destruction caused by floods in Kushalnagar, Kodagu



Near Edakumari between Mangaluru and Bengaluru



# Sentinel-1 -Synthetic Aperture Radar (SAR) sensor data with the spatial resolution of 20 m





**A house destroyed by landslides in Kaloor near Madikeri.**

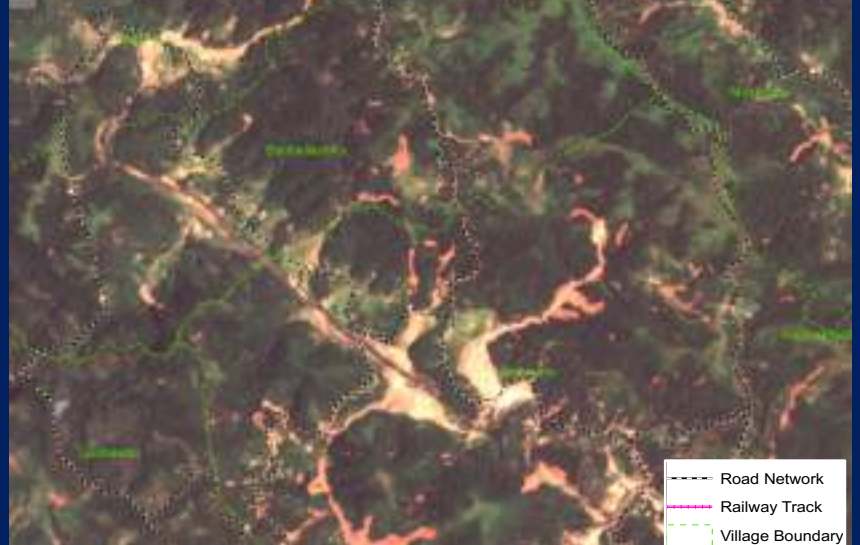


**Collapsed houses in landslides along Mangaluru road near Madikeri.**

**Pre Flood – Sentinel -2 Satellite Image (22 May 2018)**



**Post Flood – Sentinel -2 Satellite Image (9 Sep 2018)**



- Road Network
- Railway Track
- Village Boundary

# HYDRO-METEOROLOGICAL DISASTER MITIGATION PLAN

**VULNERABILITY, STUDY  
&  
MAPPING**

**REALTIME WEATHER DATA  
COLLECTION & ANALYSIS**

**WEATHER FORECASTING**

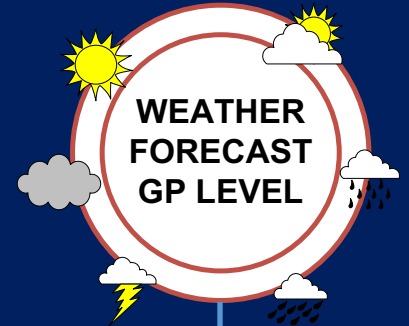
**FORECAST, ALERT  
&  
ADVISORY  
DISSEMINATION**



**HISTORICAL DATA**



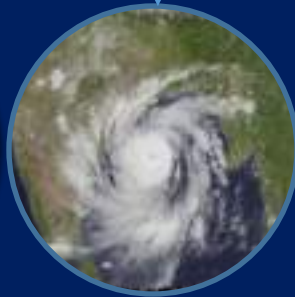
**REAL TIME WEATHER MONITORING**



**DROUGHT**



**FLOOD**



**CYCLONE**



**HAILSTROM**



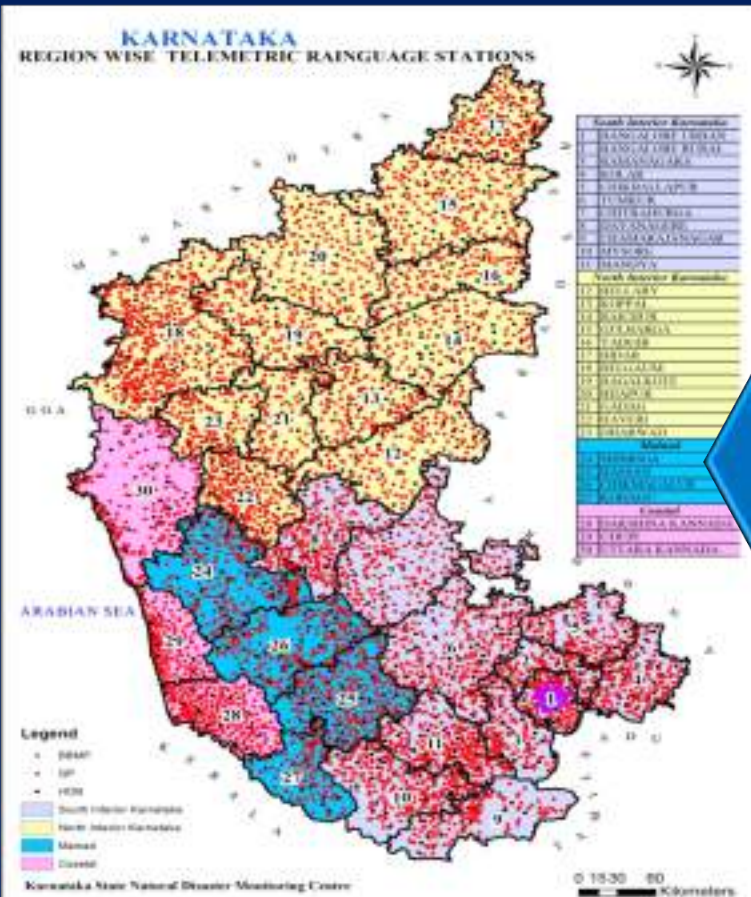
**HIGH TIDE**



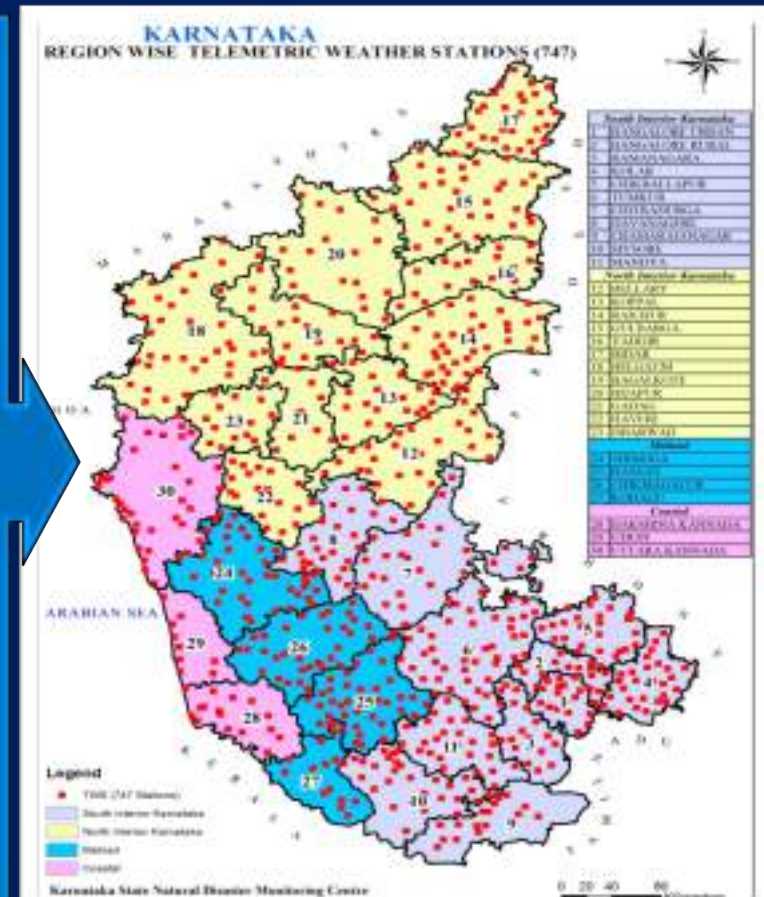
**SQUALL WINDS**

# Real Time Weather Monitoring

KSNDMC has been successfully maintaining a Network of Telemetric Rain Gauges (at Gramapanchayath level) and Weather Stations (at Hobli level)



THE  
WEATHER  
MONITORING  
NETWORK  
IS FIRST OF ITS  
KIND IN THE  
COUNTRY



**GPRS enabled and Solar Powered TRG Stations at Gramapanchayath level**  
**Total TRG Stations: 6,495**

**GPRS enabled and Solar Powered TWS Stations at Hobli level**  
**Total TWS Stations: 926**

# Weather Data Collection, Analysis, Report Generation And Dissemination is completely automated

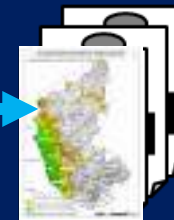
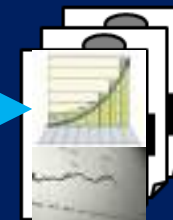
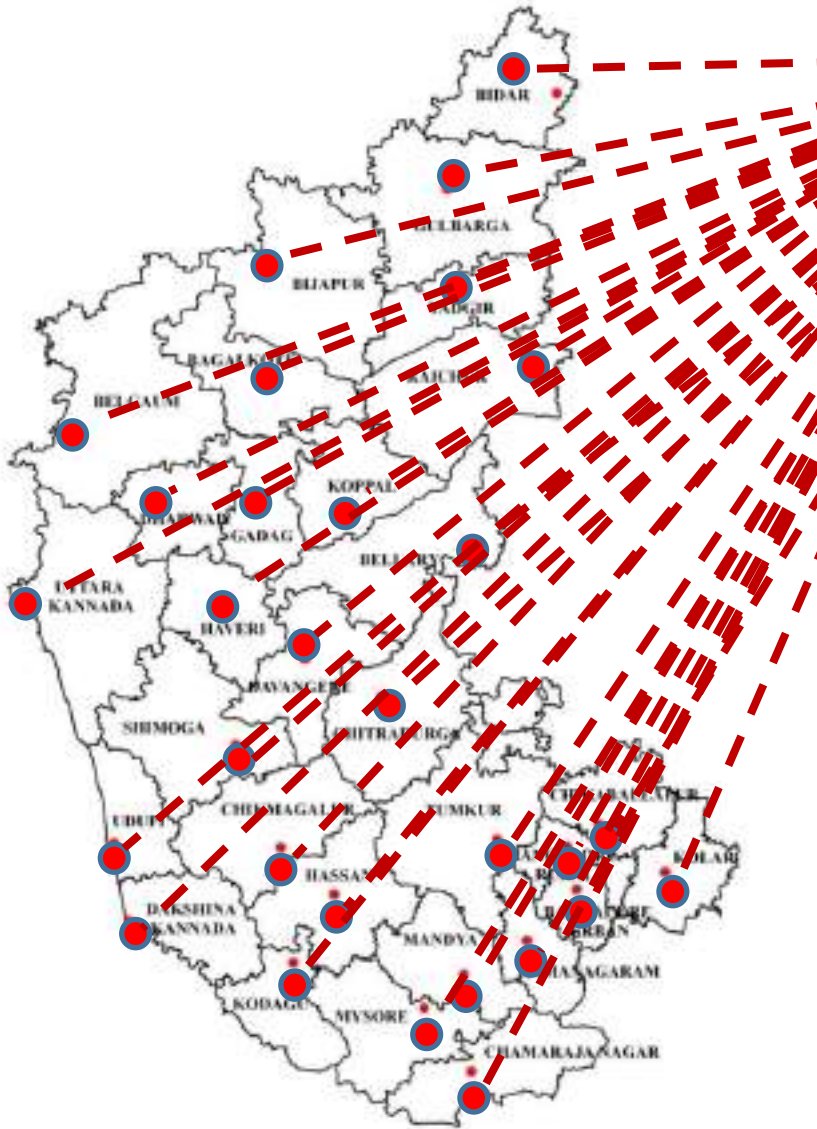
## Data Collection Mechanism

## GPRS TOWER

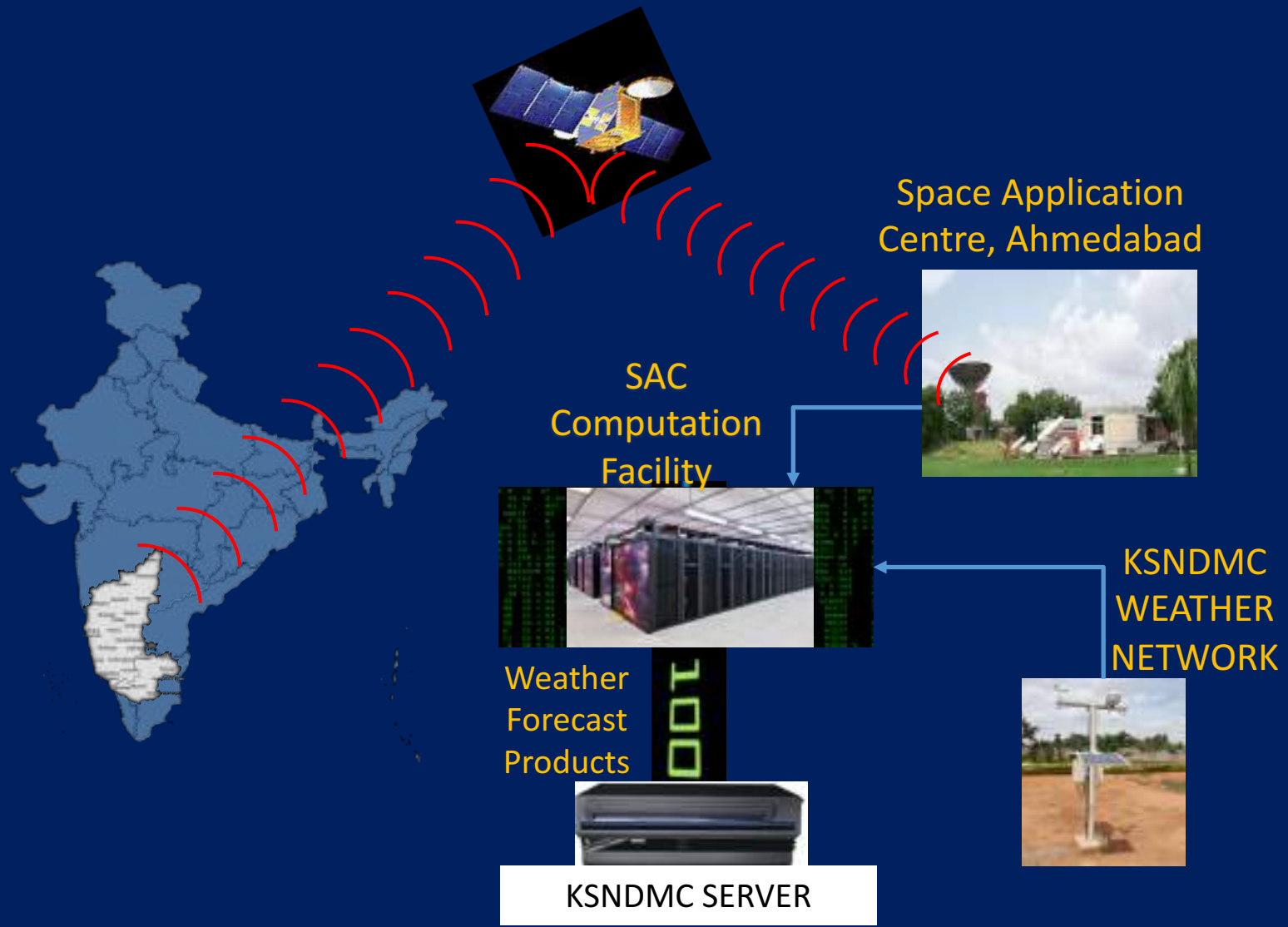
Internet

KSNDMC Server

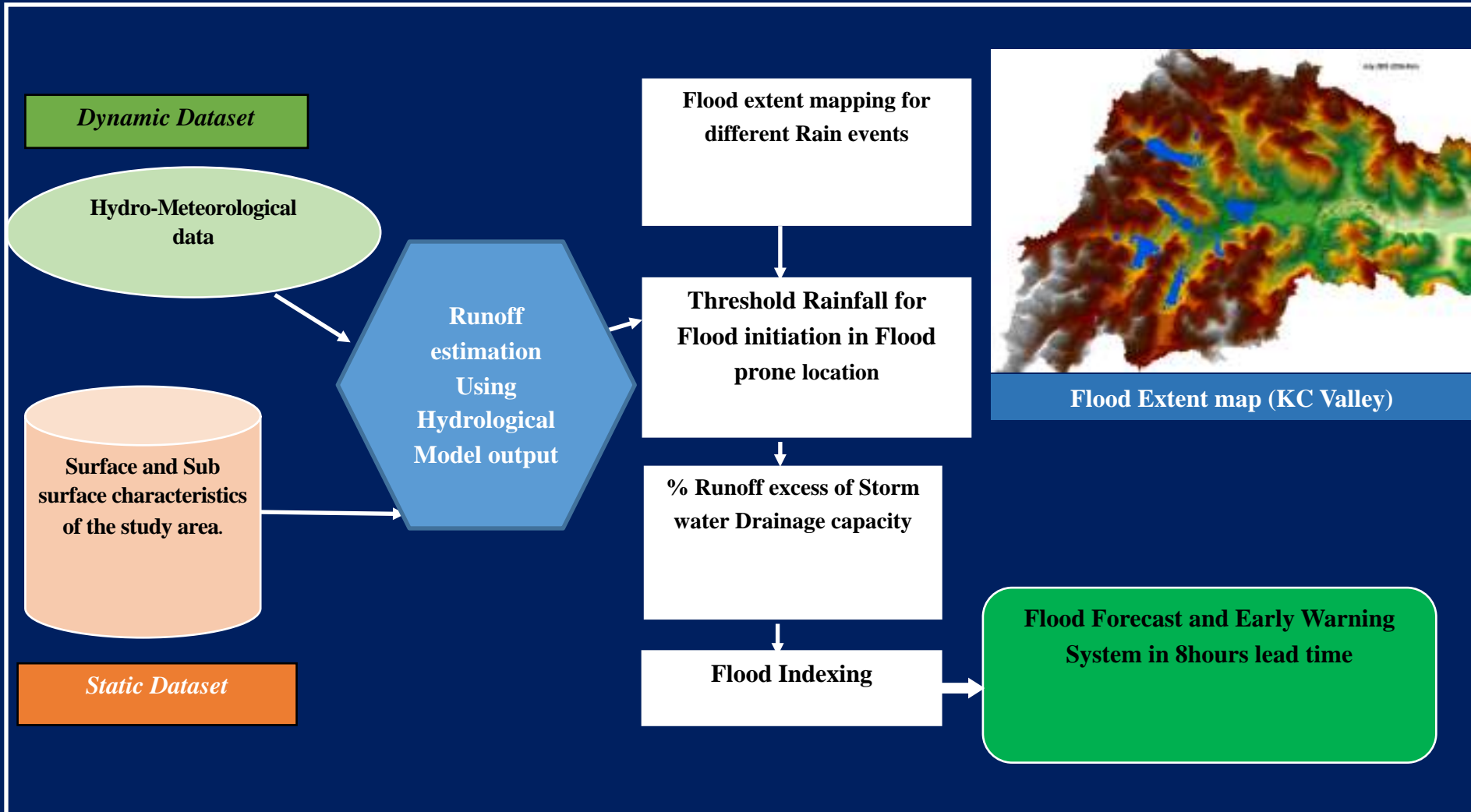
REPORTS, GRAPHS & MAP GENERATION



# Meso-Scale Weather Forecast in collaboration with ISRO, India

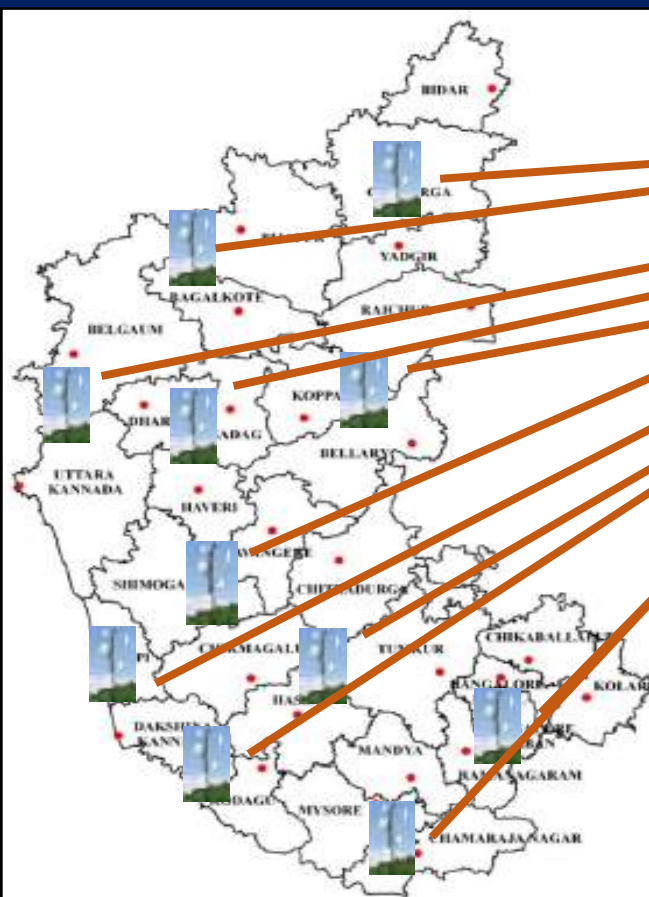


# Urban Flood forecast system for Bengaluru City



# Thunderstorm & Lightning Monitoring and Mitigation Model of KSNDMC

Based on real time Lightning and Dangerous Thunderstorm Alerts (DTA) data, Location specific Early warnings are being generated and disseminated to the public in vulnerable areas through a Android Mobile App “*SIDILU*” available freely@ Google Playstore.

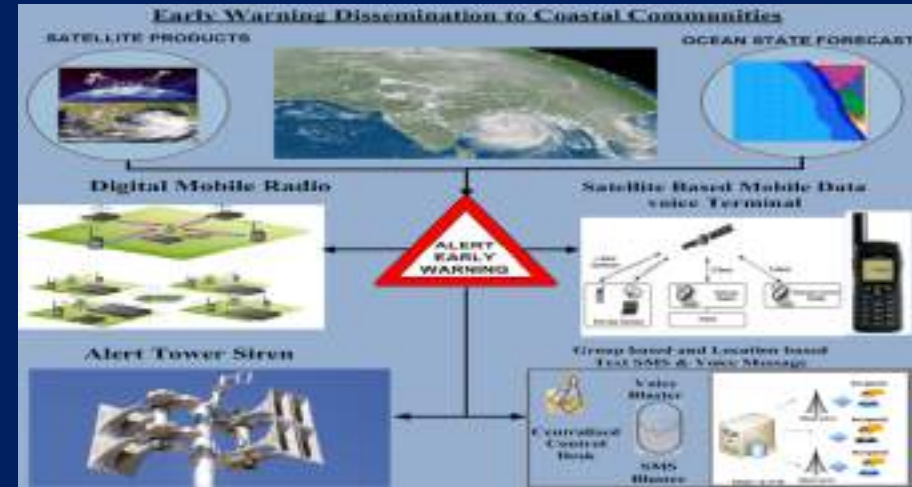


Apart from the Early Warning, the App also provides the advisory about the safety measure in the form of Do's and Dont's to the public



# NATIONAL CYCLONE RISK MITIGATION PROJECT (NCRMP)

To monitor and mitigate Cyclone, Tsunami & Storm surge Risks along the coast line in Karnataka, KSNDMC is implementing NCRM Project Component 'A' - Early Warning Dissemination System - Last Mile Connectivity.

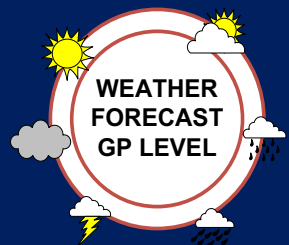


Early Warning Dissemination System - Last Mile Connectivity is a fail proof mechanism to disseminate Early Warning to the Vulnerable Communities along the Coastline before the arrival of any Cyclone / Storm Surge / Tsunami and facilitate the Authorities to take necessary action.

The dissemination mechanism is proposed to install State of the Art ICT based system viz.

- Satellite Phones, Digital Mobile Radio
- Alert Siren System,
- Mass messaging system (Text & Voice)

# Multi-Hazard Forecast / Alert / Advisory Dissemination Model of KSNDMC

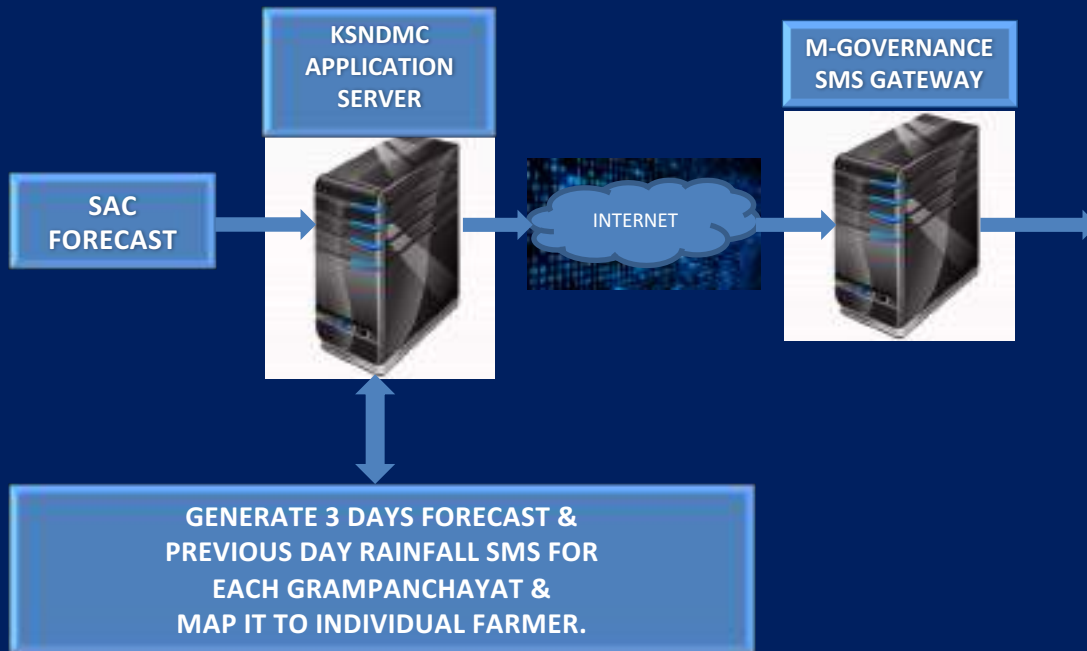




# Alert Dissemination to Officers



# Village level Weather Advisory SMS to Farmers



**Customised Weather Forecast & Advisory SMS to 2.8 Million Farmers**

# Dynamic & GIS based Web PORTAL

[www.ksndmc.org](http://www.ksndmc.org)

**Karnataka State Natural Disaster Monitoring Centre**  
(A Regd. Society of Government of Karnataka)

Home | Reports | Gallery | Video Gallery | FAQ | Feedback | Glossary | Sign In

KSNDMC: About Us | Web GIS | Query Interface | Activities | Announcements | Dashboard | RDMG Guidelines | Tender Document | Contact Us

Subscription/Update/Unsubscription of alerts on Mobile

**OBJECTIVES OF KSNDMC**

Disaster Management heavily depends on inputs from Science and Technology. KSNDMC has been serving as a common platform to the various response players in the field of Natural Disaster Management by providing timely proactive Science and Technology inputs.

Karnataka State has the distinction of being first in the country to establish a Drought Monitoring Cell (DMC) in 1988 as an institutional mechanism affiliated to Department of Science and Technology, Govt. of Karnataka and subsequently in 2007, the DMC was renamed as Karnataka State Natural Disaster Monitoring Centre (KSNDMC) and the activities were broadened.

The Disaster Management Act 2005, Government of India reiterates paradigm shift in Disaster Management from rescue, relief centric approach to Preparedness, Early Warning approach.

[For More Details, Please Click Here...](#)

**Quick Weather**  
**Weather Details**

BAGALGOTE  
TEMP RANGE: 26°C TO 34.88°C  
HUMIDITY RANGE: 66% TO 72%  
WIND SPEED RANGE: 8 km/h

**Rainfall Details**

BAGALGOTE  
RANGE: 80 MM  
TOTAL RAIN: 80 MM

BALLARI  
RANGE: 80MM TO 0.20mm

**User Created Alerts**  
BAGALGOTE No. 200 on 11/08/2015 of 10:00 AM  
One person added pictures of shewards damaged. A farmer showing the damaged proper crop at both sides in Dappur no. 200, A.C. BAGALGOTE  
[READ MORE](#)

**Recent Alerts**  
87 new Rain Recorded at KASAR NOKK & TALUK SURA in District SITTARA KARNATAKA on 11/08/2015, 08:30:03

**Safety Tips**  
FLOOD SAFETY TIPS for BAGALGOTE 11/08/2015 7:30:03 PM by KSNDMC  
[READ MORE](#)

**Articles**  
[Add Articles](#)  
[Click Here For All Articles](#)  
**All Alerts**

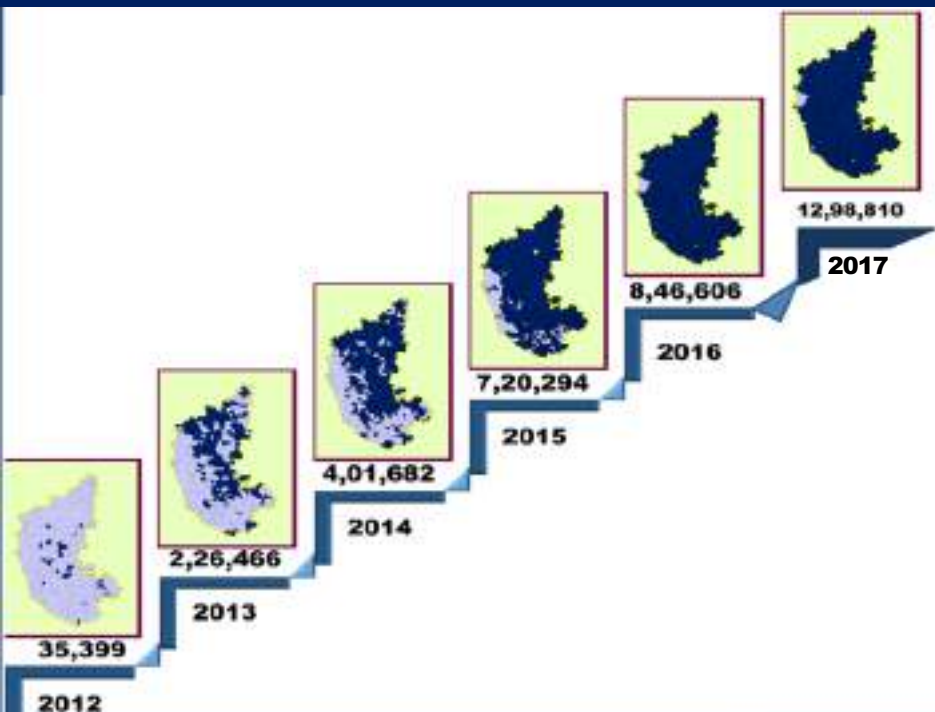
Total visitor Count : 369141 Last Visit Time : 15/08/2015 11:14:30 AM

[f](#) [t](#) [w](#)

# 24 x 7 Interactive Help-Desk “Varuna Mitra”

A Dedicated Telephone with 30 parallel lines, disseminates Weather information, Forecast and Advisories directly to the farmers & Public.

Interactive facility has enabled the Farmers with the first hand Information with clarity whenever **THEY NEED.**



# Varuna Mitra –CRM Application



VarunaMitra

Search



EDET CALLER



FORECAST



TRG/TW'S DATA



NUMBER

7022483287

NAME

mallesh

DISTRICT

KODAGU

TALUK

WADIKERI

HOBLE

NAPOKLU

GRAMPANCHAYAT

Kanjala (GP)

GP\_CODE

25010303



RESERVOIR DETAILS



NATURAL DISASTER



CROP ADVICE

ಕೊಡಗು ಜಿಲ್ಲೆಯ, ಕುಂಜಿಲ ಗ್ರಾಮಪಂಚಾಯಿತಿ ವ್ಯಾಪ್ತಿಯಲ್ಲಿ, ಗುಡುಗು ಸಹಿತ ಮಳೆ ಹಾಗೂ ಸಿಡಿಲು ಬಡಿಯುವ ಸಾಧ್ಯತೆಯಿದೆ

ALTERNATE NUMBER

07022483287

AACHAR NUMBER

DATE ADDED

08-01-2017 14:54:46

LAST CALLED DATE

8/19/2018 1:39:14 PM

HELP DESK SOURCE

FRIEND

CALLER GROUP

FARMER

CROP NAME

NO CROP

CROP STAGE

YET\_TO\_SOW (ರೈತನ ವಾರ್ಡೆಹ)

CROP AREA

VILLAGE NAME

SURVEY NO.

NO CROP

YET\_TO\_SOW (ರೈತನ ವಾರ್ಡೆಹ)

IRRIGATION FACILITY

PLEASE SELECT

IRRIGATION SOURCE

PLEASE SELECT

NO CROP

YET\_TO\_SOW (ರೈತನ ವಾರ್ಡೆಹ)

TOTAL FARMING AREA

NO CROP

YET\_TO\_SOW (ರೈತನ ವಾರ್ಡೆಹ)

UPDATE CALLER

