Multi-Hazard Early Warning System in Karnataka-India

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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

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.
HYDRO-METEOROLOGICAL DISASTER MITIGATION PLAN

VULNERABILITY, STUDY & MAPPING

REALTIME WEATHER DATA COLLECTION & ANALYSIS

WEATHER FORECASTING

FORECAST, ALERT & ADVISORY DISSEMINATION
Real Time Weather Monitoring

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

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

KSNDMC Server

REPORTS, GRAPHS & MAP GENERATION
Meso-Scale Weather Forecast in collaboration with ISRO, India
Urban Flood forecast system for Bengaluru City

- **Dynamic Dataset**
  - Hydro-Meteorological data

- **Static Dataset**
  - Surface and Subsurface characteristics of the study area.

- Runoff estimation
  - Using Hydrological Model output

- Threshold Rainfall for Flood initiation in Flood prone location

- % Runoff excess of Storm water Drainage capacity

- Flood Indexing

- Flood extent mapping for different Rain events

- Flood Forecast and Early Warning System in 8hours lead time

Flood Extent map (KC Valley)
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.
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

GPRS

KSNDMC
DATA
SERVER

SMS

EMAIL

KSNDMC
APPLICATION
SERVER
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

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 the 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 reactive, relief-centric approach to Preparadness, Early Warning approach.

For More Details, Please Click Here...
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

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Caller Group: FARMER

District: KODASU
Taluk: KADIKERI
Mobil: NAFOILLU
Grampanchayat: Kaniyala (SP)
GP Code: Z6010303
A Book on Innovations released by Hon’ble Prime Minister Of India

New Beginning

Disaster Preparedness

Innovation no longer remains a choice but has become an imperative

Narendra Modi

Edenred's new Decision Monitoring Center (DMC) has taken up providing real-time, machine learning and AI-based decision support system (DS) to the state government. It has designed and implemented a system to support the state's decision-making process, which includes real-time monitoring of various parameters such as agriculture, health, and education. The system also provides predictive analytics to help in making informed decisions.

Disaster Preparedness

Innovations in Disaster Management

"Innovation no longer remains a choice but has become an imperative." - Narendra Modi

Narendra Modi