Systematic Databases for Disaster Risk Reduction

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Potential Uses of Disaster Databases

Pre-disaster Phase

- Develop a simple disaster risk indexing system that tracks the patterns of disaster risk - spatially and temporally.
- Develop a policy advocacy tool for drawing attention to disaster issues for prioritizing mitigation measures
- Analyze how development policies and practices have enhanced or reduced disaster risk

Cont….

Post- disaster Phase

- **Situation analysis and reporting:** detailed information on geographical scale of impact, losses and population affected will enable preliminary analysis.

- **Needs and Gaps Analysis:** Information on the community needs and information gaps can be disseminated to agencies for better response.

- **Response Planning:** access to reliable information/ vulnerability analysis can improve co-ordination between different agencies providing relief and recovery assistance.

- **Relief measures:** tracking system for relief measures adopted by various govt. non governmental organizations.

cont.

- **Damage Assessment:** Statistical database on the sectoral damages and geographic distribution (segregated and aggregated)

- **Recovery Framework**: can propose appropriate mitigation measures through reconstruction and rehabilitation strategies based on vulnerability data.

cont.

Databases/ Information relevant for Disaster Risk Reduction

- **Disaster database** : Database of all the major and minor events happened. Ex: Orissa using Des inventar)
- **Hazard database:** Database on the existing hazard types. (Earthquake, flood Cyclone etc.) Ex: BMTPC Atlas
- **Development/ Vulnerability Indicators Database:** Data base on the demographic, socioeconomic indictors

  (e.g.. Health Index, Income Index etc)

Disaster Databases in India: Current Scenario

- **Ministry of Home Affairs:** reports on all national calamities and major events; Incident Alert System (since 2005)
- **State Government**: State Department of Disaster Management /**Relief** or **Revenue** record information/fact sheets on all major disaster events.
- **District Administration:** Reports /data available with District Collector's / District Magistrate's Office. Many districts started developing digital database on disasters with the support of NIC.
- **Sub-district (block) and Tehsil**: Block Development Office and Tehsildar's Office having compiled information from villages/towns in their block/Tehsil.
- **Gram Panchayat** (GP) : Revenue Clerk or Patwari office have information on one or more villages (GP).

Cont….

Disaster Databases in India... continued

- **Directorate of Health and Veterinary Department:** Epidemics, Pest Attacks
- **Department of Agriculture:** Drought
- **NIDM-** Disaster Updates
- **State Disaster Management Authorities:** OSDMA and GSDMA have inventories of major state disasters.
- **National Informatics Centre (NIC):** District NIC has information on past disasters (for few districts)
- **State Remote Sensing Agencies and Institutions:** Maharastra State Remote Sensing Agency, UPRSAC, ARSAC, DMMC etc.

Cont….

- **Central Water Commission:** Daily Water Level and Forecasts. CWC also disseminate Flood Bulletin to MHA Control Room.
- **India Meteorological Department :** Preliminary Report of Earthquake tremors; Severe weather related events.
- **Geological Survey of India:** Earthquake data on India and its surroundings, database of Landslides and Avalanches.
- **National Remote Sensing Agency:** Satellite data as well as maps depicting the situation.
- **Disaster reports** by various UN Agencies, NGOs, CSOs etc.
- **Media** reports

Data bases on Hazards

- **BMTPC :** Vulnerability Atlas of India has database/ maps for Earthquake, Floods , Wind Cyclones and Landslides.
- **IMD:** Seismic Hazard Microzonation for Delhi
- **NRSA:** Flood hazard Microzonation for the coastal districts as well as North Eastern States of India.
- **IITs:** Seismic Hazard Micro Microzonation for few cities (e.g. Derhadun using Hazus Methodology)

Data bases on Development and Vulnerability Indicators

- **Planning Commission :** Human Development Reports (National and State level)
- **Census of India :** Database on the demography and Amenities.
- **DevInfo India** (a database of Social and Development Indicators) developed by the Ministry of Statistics and Programme Implementation in collaboration with the UN System in India
- **MHA-NRSA :** National Database for Emergency Management and Decision Support System.
- **MHA- UNDP :** India Disaster Resource Network Portal (Inventory of Resources).
- **NNRMS:** DST and DOS.
- **NSDI:** National Spatial Database Infrastructure.
- **ENVIS Portal (Ministry of Environment & Forests):** ENVIS is an information management system focused at collection, collation, storage, retrieval and dissemination of environmental information

Users: Potential and Existing

- Administrators and DM Professionals at all levels (preparedness, mitigation and response).
- Various Ministries and Departments involved in DM. (e.g. Urban Planning, Land use Planning etc)
- UN Agencies, NGO's and CSOs.
- Academic and Research Institutions.
- Insurance companies.

Limitations in the Existing Databases

- Scattered databases not easy to collate for comparative analysis
- Data/ Information with different departments.
- Details of the small , medium scale events may not be available.
- Different departments use own formats for entering data sets.
- Information captured may not be tuned for hazard vulnerability analysis.

Disaster Inventorisation in India
Orissa Pilot

- Pilot project (Indis data) completed to test and adapt DesInventar methodology in Orissa (2002-2004).
- Data collected for 30 districts and 314 blocks
- 32 years data (1970-2002) collected from media & Government records.
- Institutionalization with Government (OSDMA) for sustainability.
- Vulnerability report based on disaster inventory and other relevant datasets.

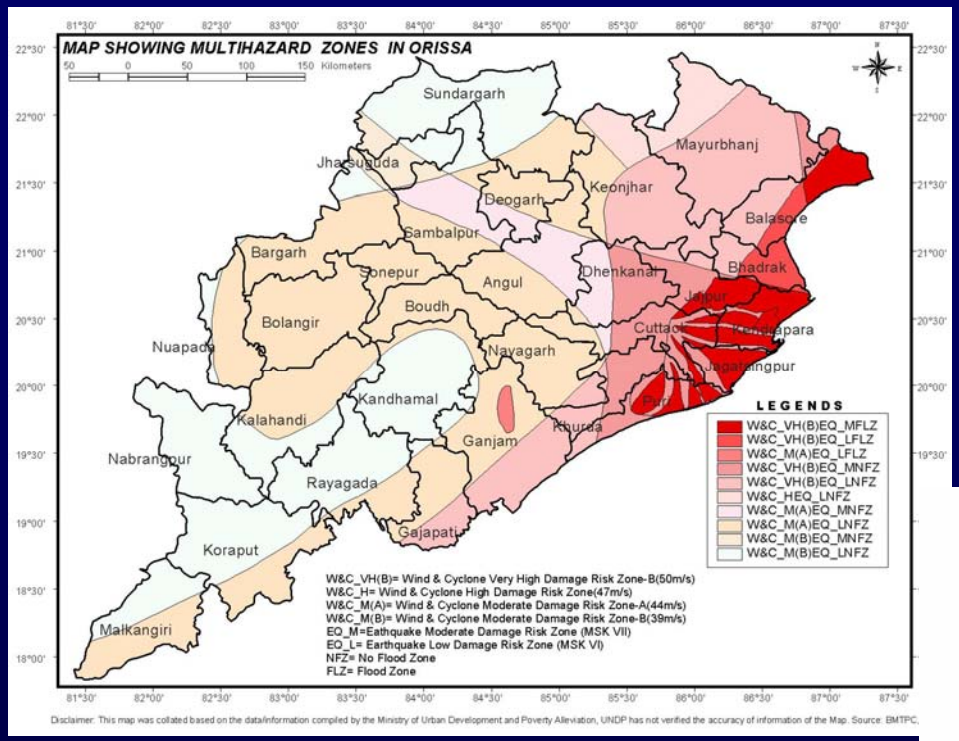
Disaster database and Vulnerability Analysis

- Introductory workshop on disaster inventories and DesInventar methodology.
- Specific training on DesInventar tool.
- Identification of data sources and securing access to them
- Customization of methods and software for Orissa
- Selection and training of researchers
- Data collection and Data entry by researchers
- Data validation followed by overall analysis of patterns
- Sector specific analysis of patterns and generation of hypothesis
- Use of the information and inferences as inputs for compiling Orissa Vulnerability Report

Preliminary Findings

- Interpretation and analysis of the data shows new dimensions of risk & vulnerabilities of the State.
- Cyclones (life) and floods (livelihood) are Orissa's most damaging disasters.
- Epidemics are the greatest cause of deaths after cyclones.
- Fire is the greatest cause of household property destruction. Many epidemics follow floods .
- Deaths due to epidemics indicates the high human vulnerability and lack of adequate planning and medical facilities.
- There has been increasing damages to property showing high degree of physical exposure, while the number of deaths are reducing.

Total Number of Deaths Reported and its comparison with Vulnerability Atlas



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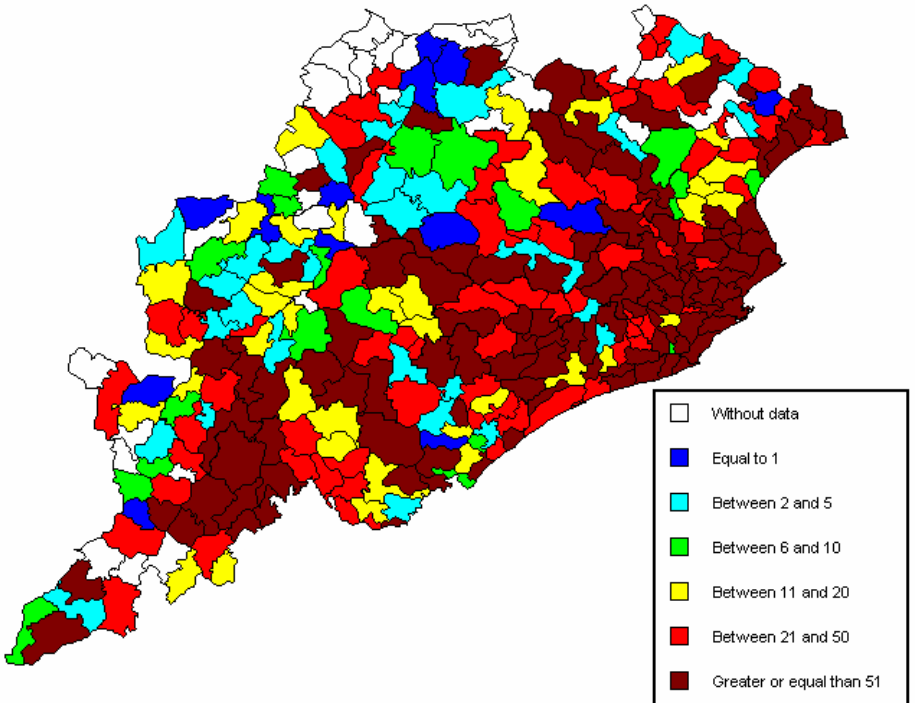
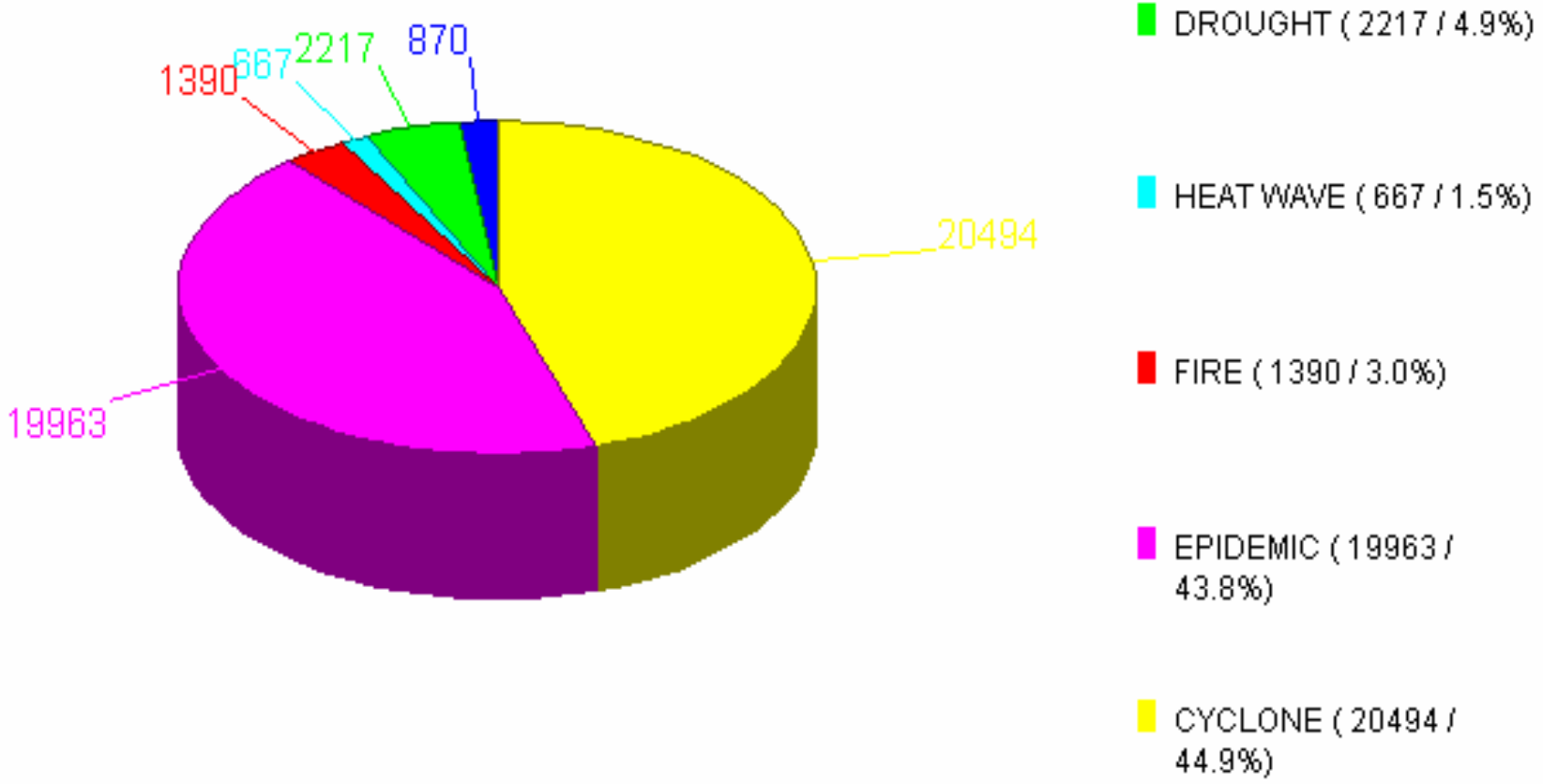


Districts like Rayagada , Koraput Kalahandi have low multi-hazard vulnerability (BMTPC ATLAS). Most of the deaths are due to Famine, epidemics etc.

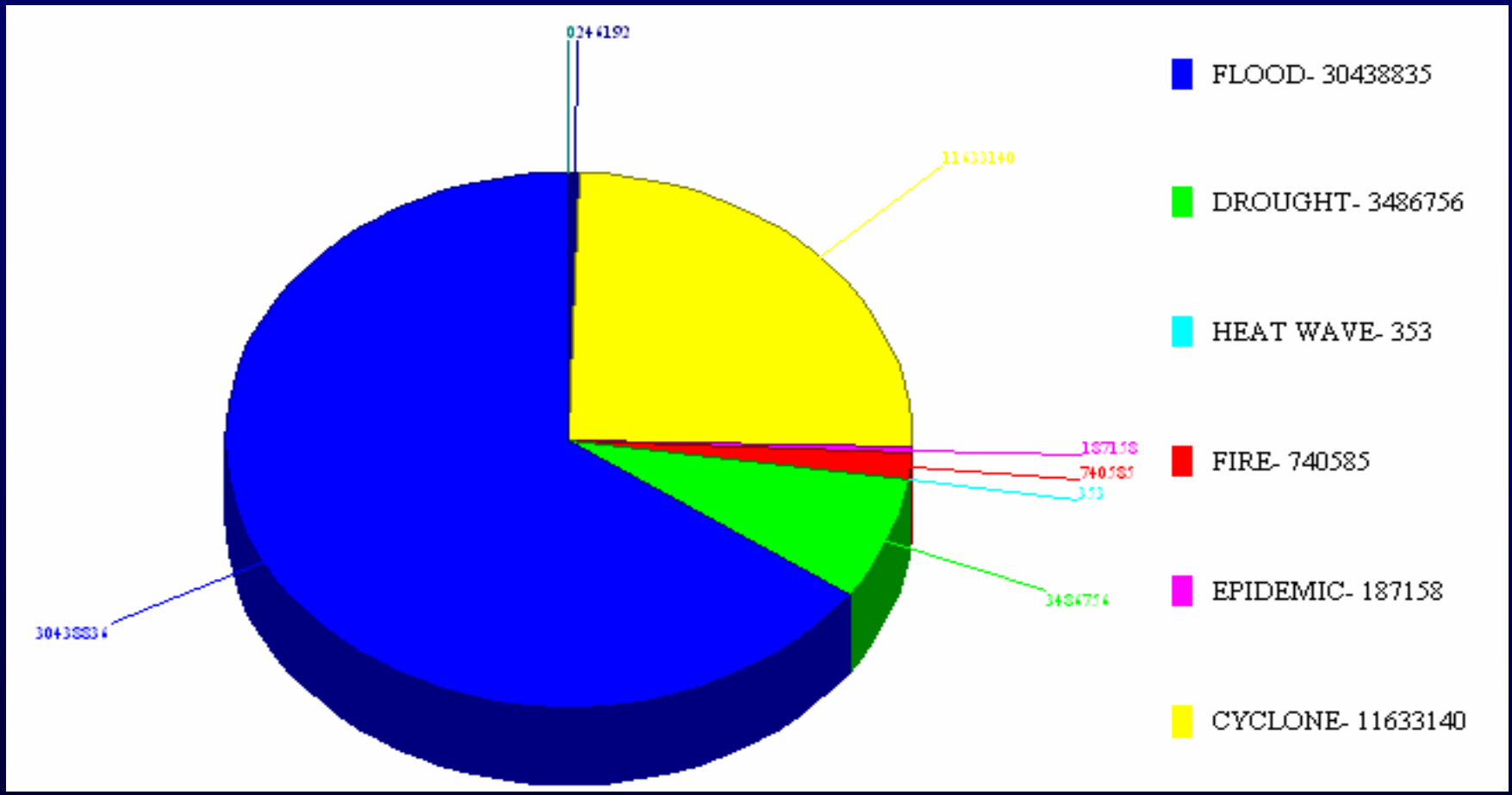
But the lose of life due to various natural and Manmade disasters are high in these districts.

This real time data uncover the hidden vulnerabilities like lack of awareness, low economy level, poor health facilities etc.

Impact of Various disasters on life

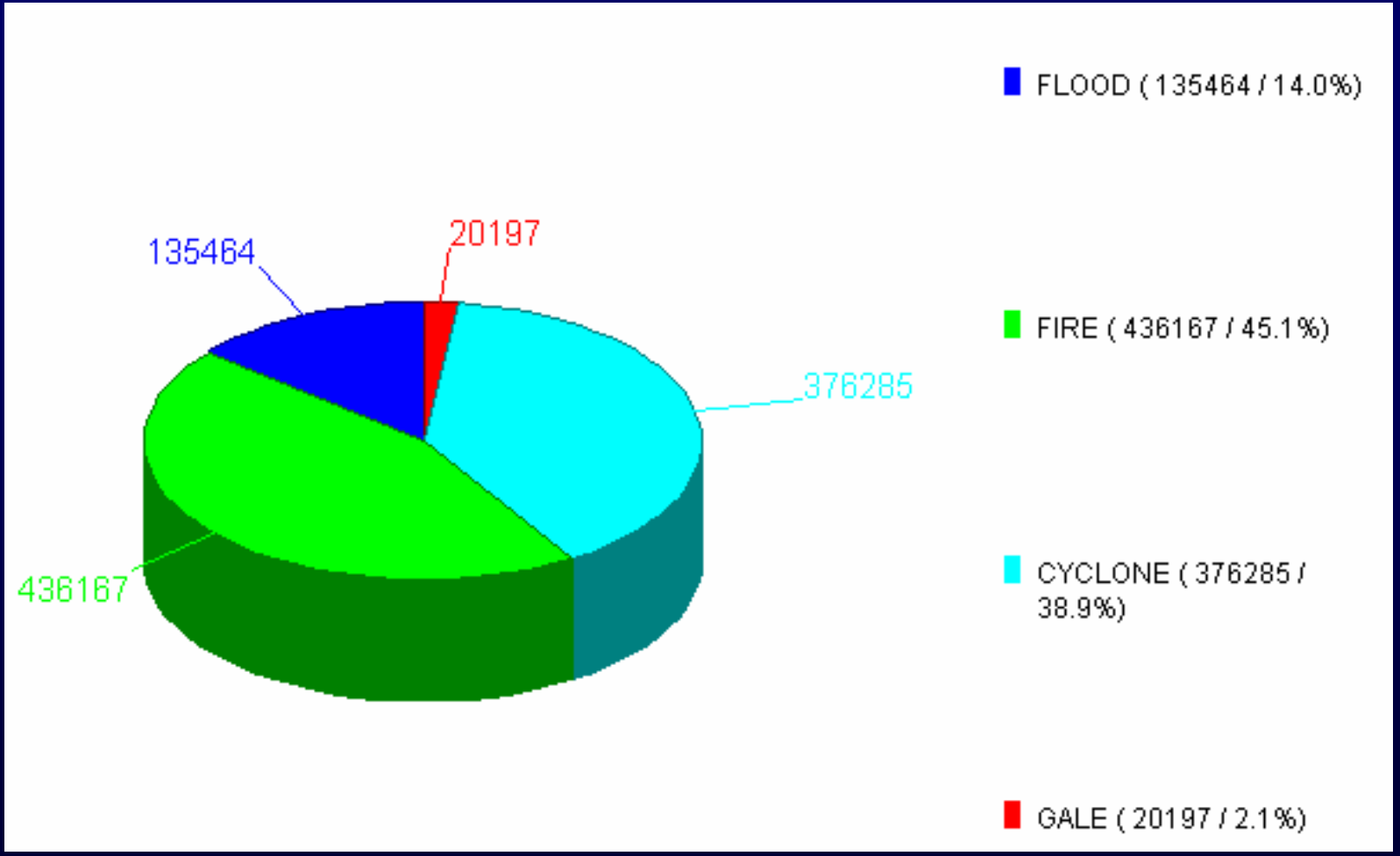


No of People affected by various Disasters (livelihood)



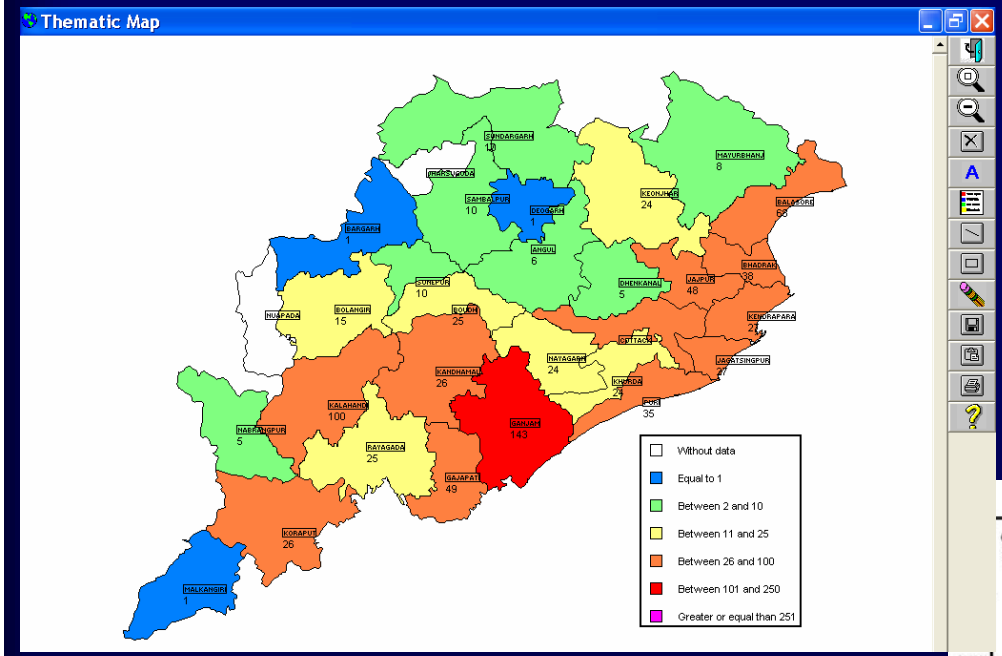
- No of people affected is highest due to floods
- Fires make people more vulnerable in terms of property but floods in terms of livelihood
- No. of deaths due to floods decreasing but the damage to property and livelihood increasing.

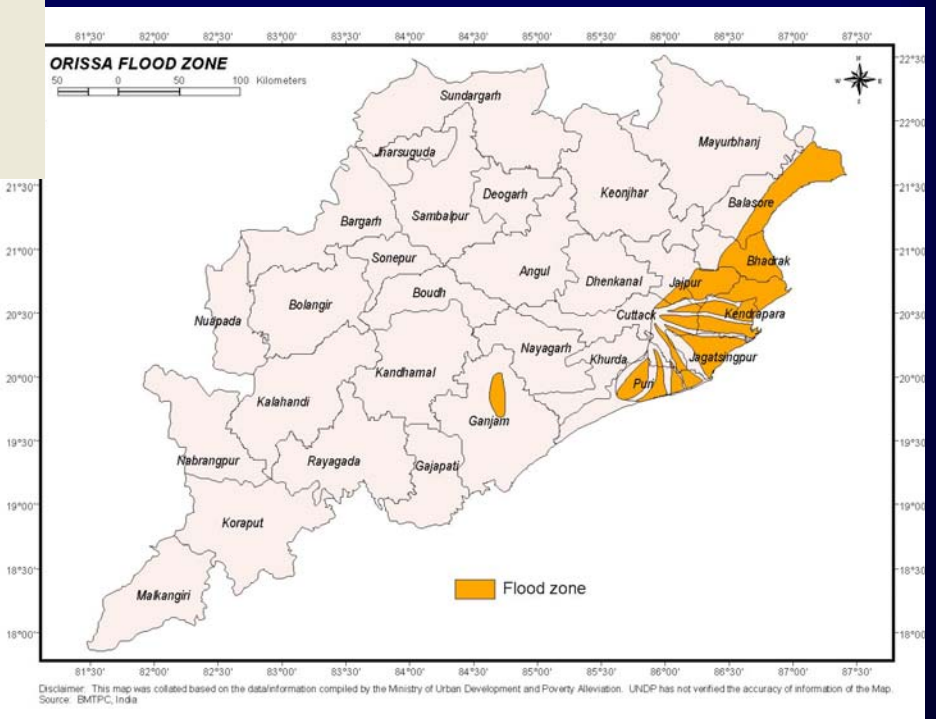
Number of houses destroyed by various disasters



- No of houses damaged due to fire is highest.
- More than 90% fire incidents are due to human mistake.
- Major reason for the loss of property due to fires the building material used and settlement patter

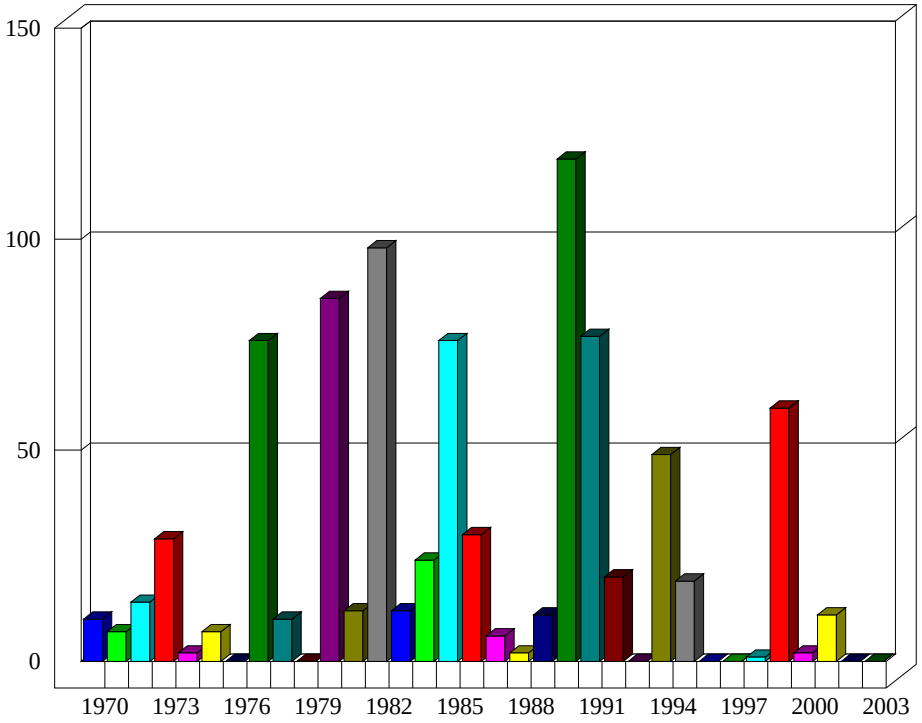
Number of Deaths Reported - Floods



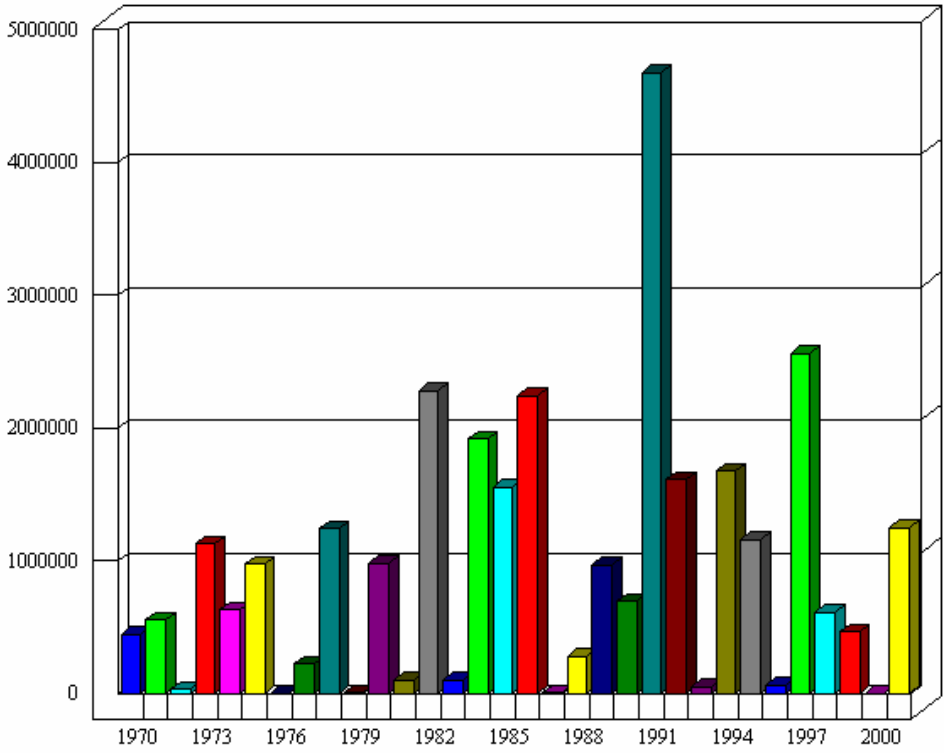


Number of People dead and affected by Floods

No of People Affected

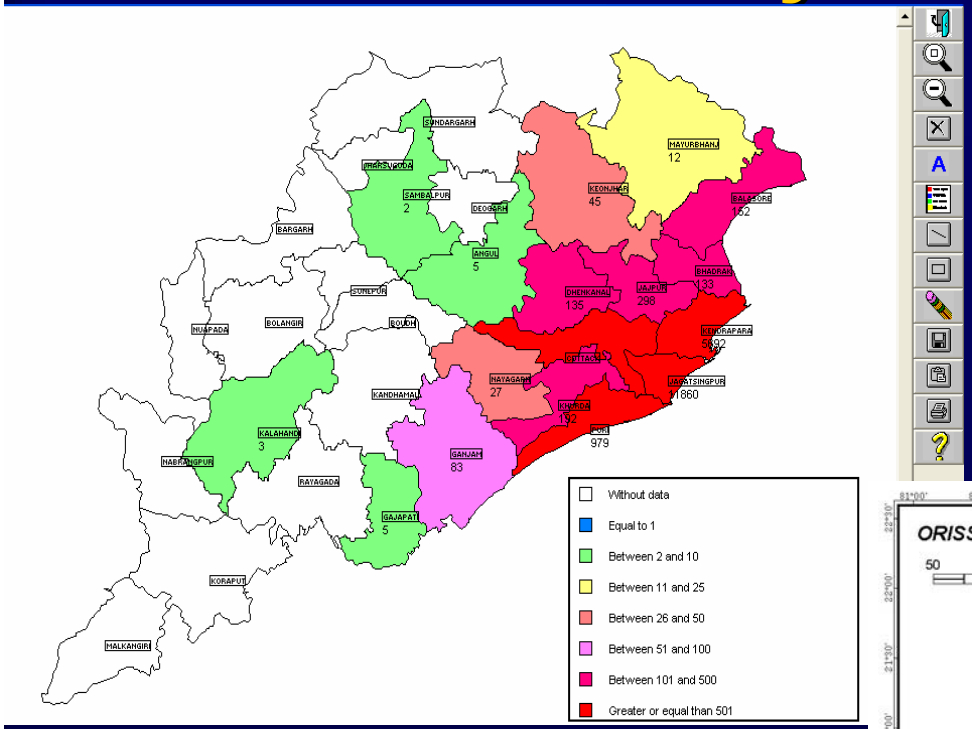


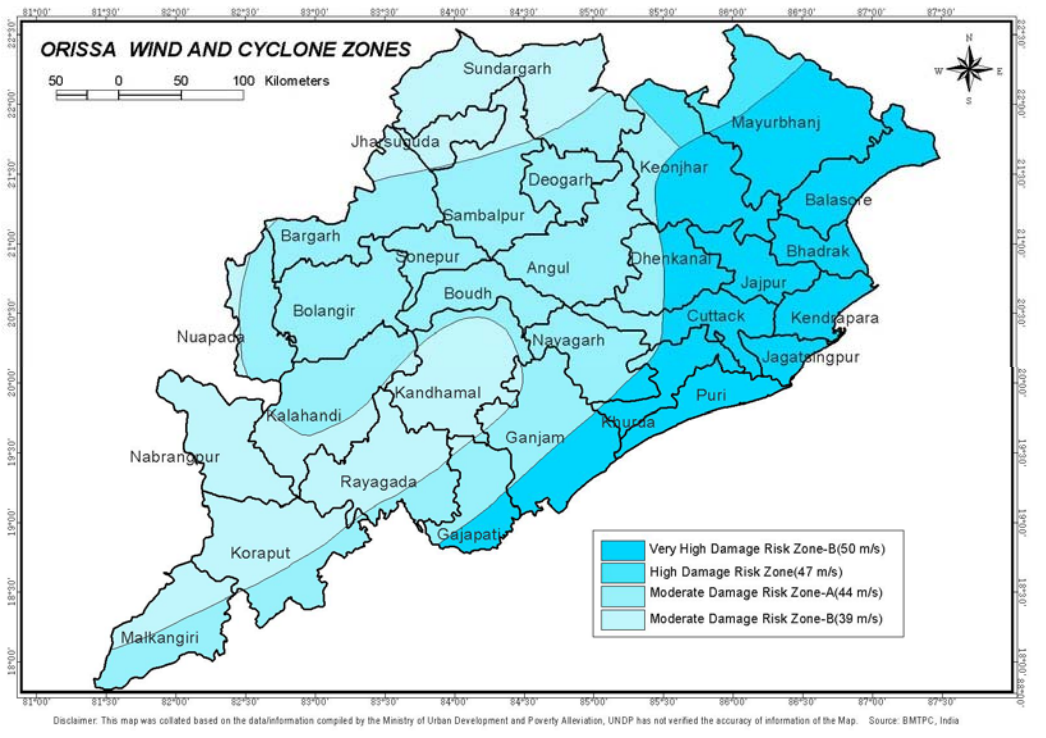
No of People Affected



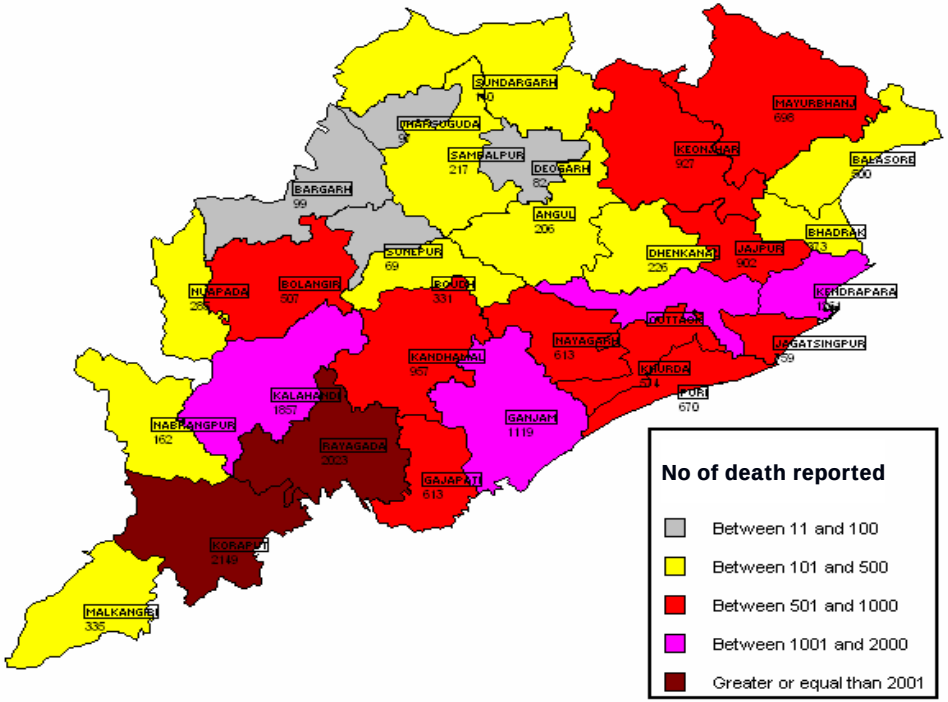
No of people dead is less than 20 for 2001 but the number of people affected very high

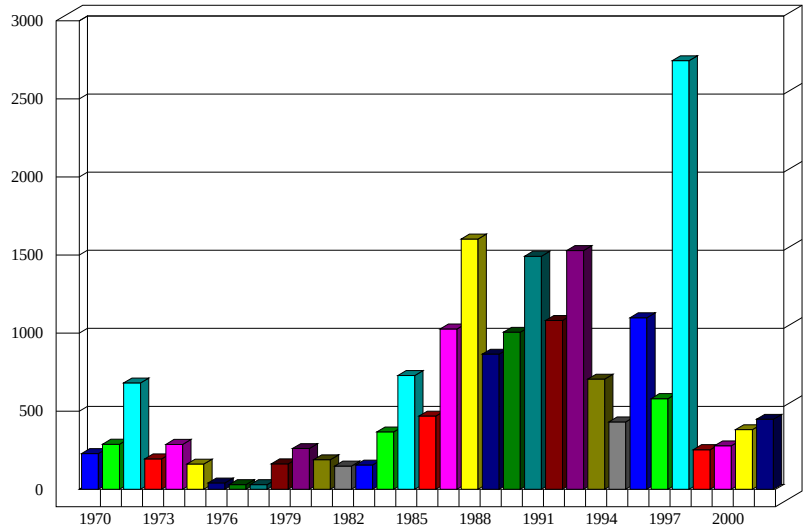
Number of deaths reported – Cyclones



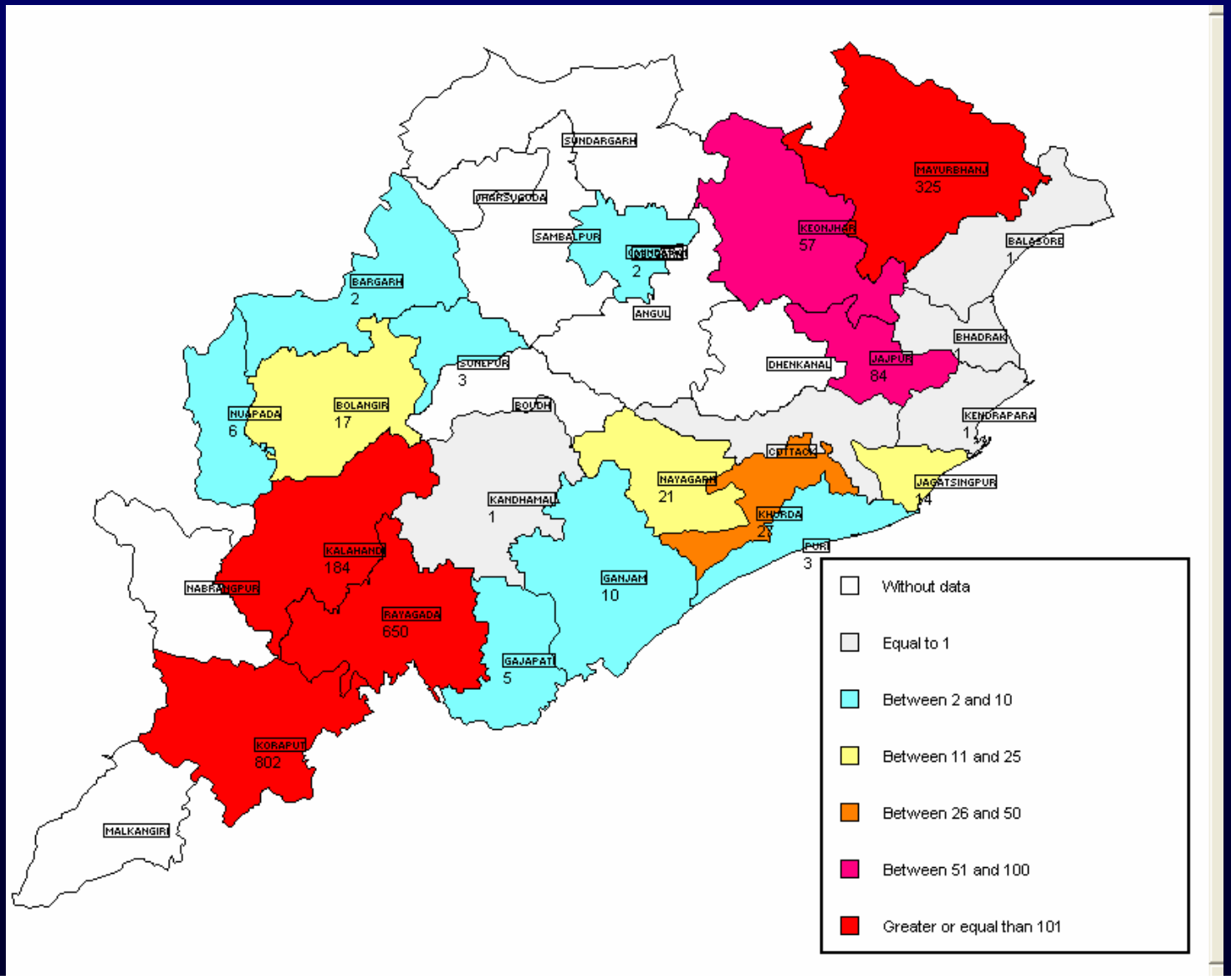


Number of Deaths reported – Epidemics

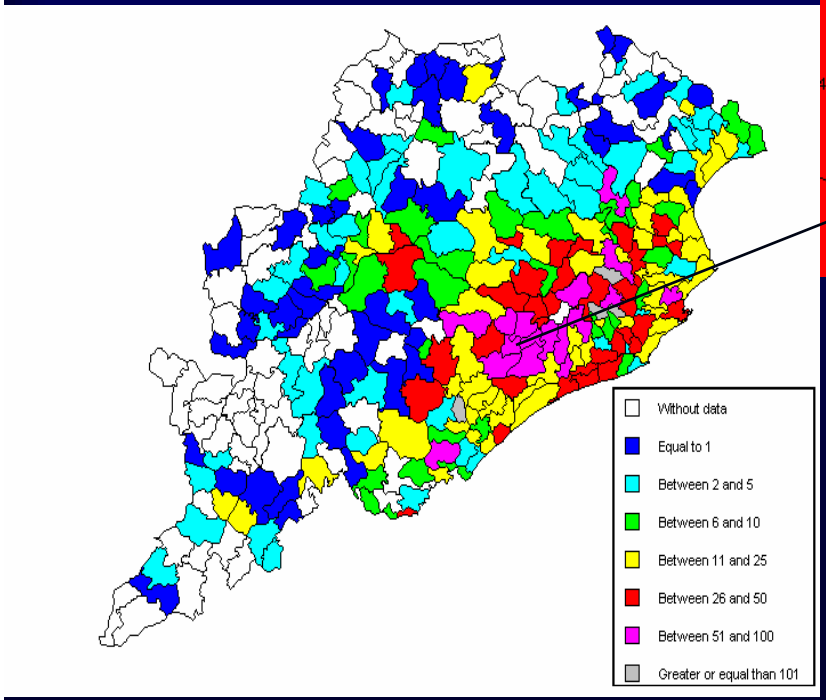


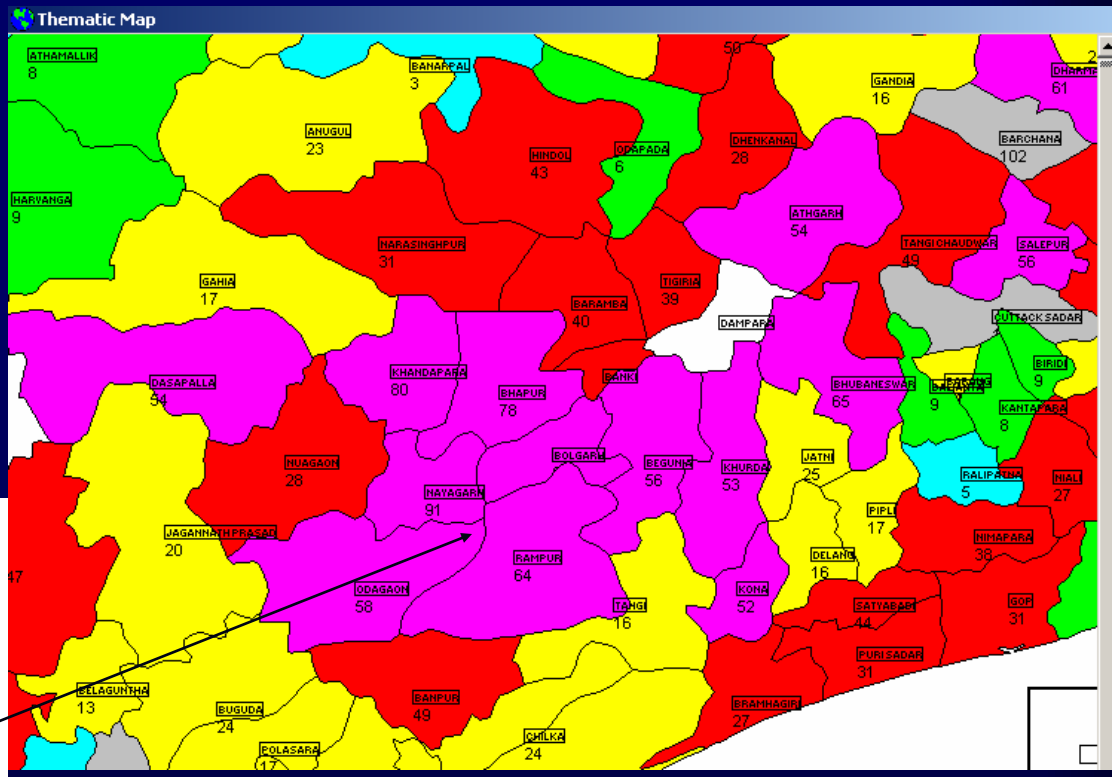


Number of deaths reported – Drought and Famine



Number of Fire Events reported

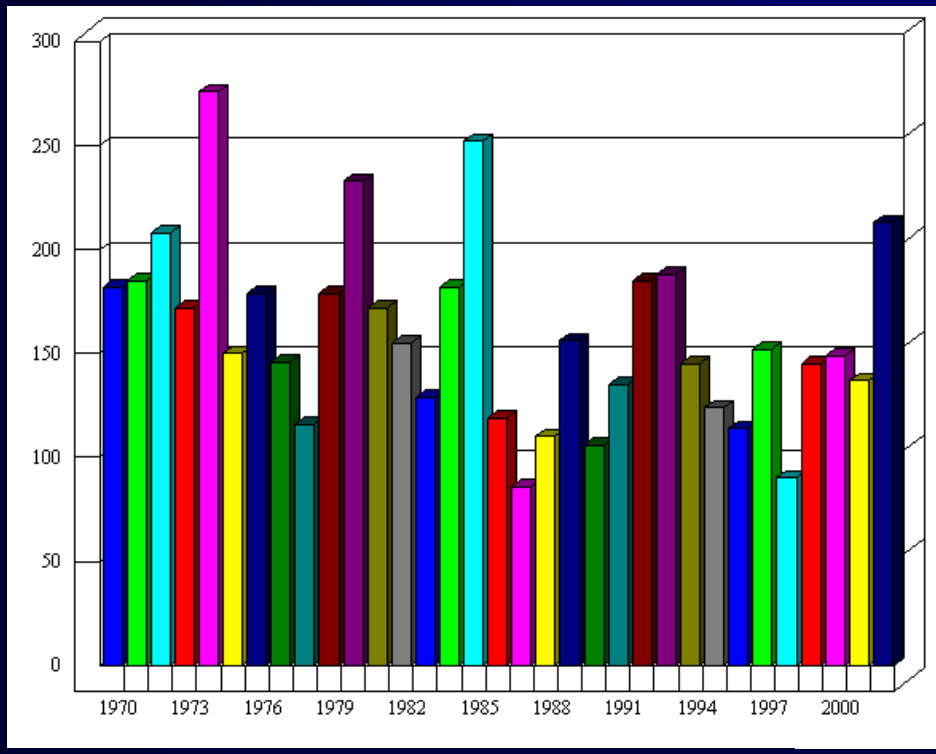




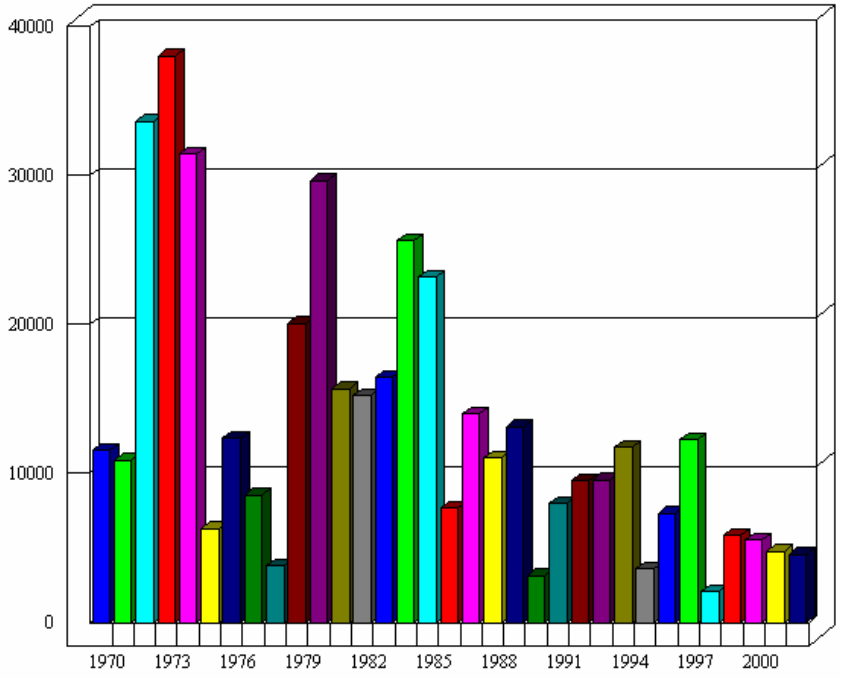
Fire events are highly localized, Most of them are limited to few vulnerable pockets.

Most of the accidents are reported from industrial areas or rural areas .

Number of Fire Incidents Reported



Number of Houses Damaged due to Fire



Number of houses damaged due to fire is showing a decreasing trend because of the use of better construction materials and technology.

Conclusion of Indis Data Risk Analysis

The pattern uncover the underlying causes of vulnerabilities other than geographical/physical vulnerability

- Lack of diverse livelihood options
- High density of population in hazard prone areas leading to increasing levels of physical exposure
- Poor living standards (infrastructure, communication, Health, transportation etc.
- Lack of awareness

The results derived from the Analysis of Historical database can supplement the Hazard Vulnerability and Risk Analysis.

TamilNadu

- Tsunami (2004) data has been inventorised using desInventar and analyzed using desconsultar tool.
- Analysis has helped in understanding the relationship between the livelihood & occupation pattern with disaster impacts. Challenges in data segregation and misleading results.
- Under the regional Tsunami Recovery Programme historic Disaster data collection has been initialized by department of Revenue and Administration.
- Consultation meeting with partners and implementing agencies (29 March, 2006)
- Institutionalization with Anna Institute of Management, State ATI.

UP and Uttranchal

- Disaster inventorisation has been initialized in UP and Uttranchal under DRM Programme.
- UPAAM is the implementing agency in UP. Consultation meeting with partners organized in February 2006. Data for 2000-2006 period has been collected for UP.
- DMMC is the implementing agency in Uttranchal. Consultation meeting with partners organized in March 2006. Data collection has been initialized.
- Similar initiatives will be starting in Delhi, Arunachal Pradesh and Maharastra in the coming months.

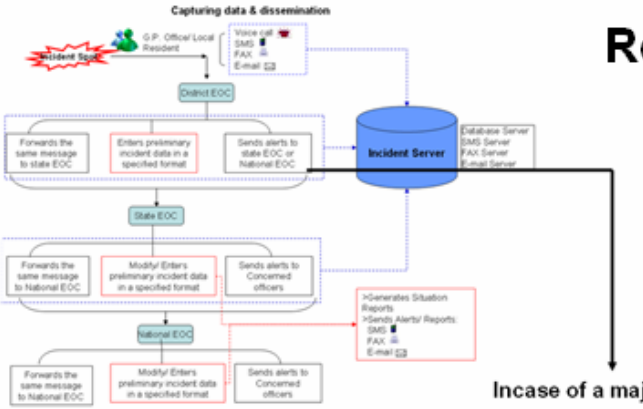
Challenges

- Creating acceptance at the state and national level to initialize disaster inventorisation.
- Identifying potential uses and users of disaster databases.
- Sustainability Issues for prospective data collection.
- Integration of diverse disaster data hosted by different Ministries.
- Different vernacular/local languages.
- Political and administrative issues associated with depicting disparate response and relief measures etc.

Road Ahead

- **Short-medium term:** DesInventar used for inventorisation and vulnerability analysis under ongoing programmes – UNDP DRM, Tsunami RP etc.
- **Medium-long term:** create a national commitment to integrate disaster databases
- **Long term:**
  - **Institutionalization of National and State level Vulnerability Reports through ATI's, NIDM.**
  - **Data updating mechanism through Incident Reporting System (IEOC, SEOCs and DEOCs).**

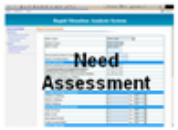
Reports and Utility of the System

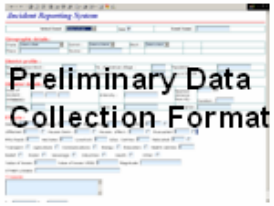


- >Situation Reports
- >Alerts
- >Damage Assessment
- >Need Assessment
- >Immediate Relief Requirements
- >Intervention Gap Analysis
- >Long term recovery and rehabilitation planning
- >Disaster Trends and patterns report
- >Risk identification

Incase of a major event

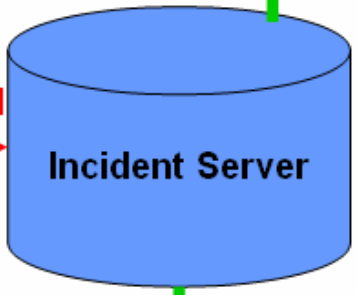
The system can be extended to capture more detailed damage , needs and intervention gaps.



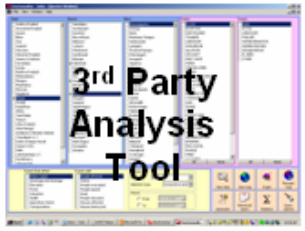


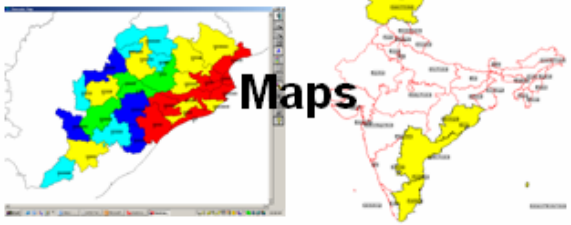
Based on these reports detailed situation analysis at State/ National level can be carried out

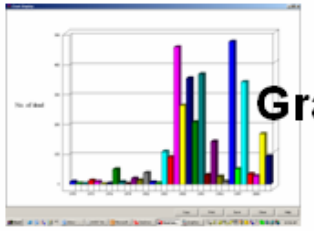
Archived

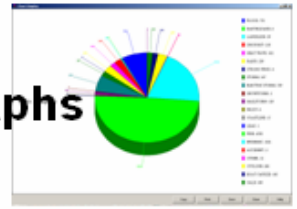


Research and analysis









Research and analysis of time series disaster data through 3rd party analysis tools for trends, patterns of disasters and risk identification using graphs, maps etc.

THANKS

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