

The Role GIS Can Play in Disaster Management

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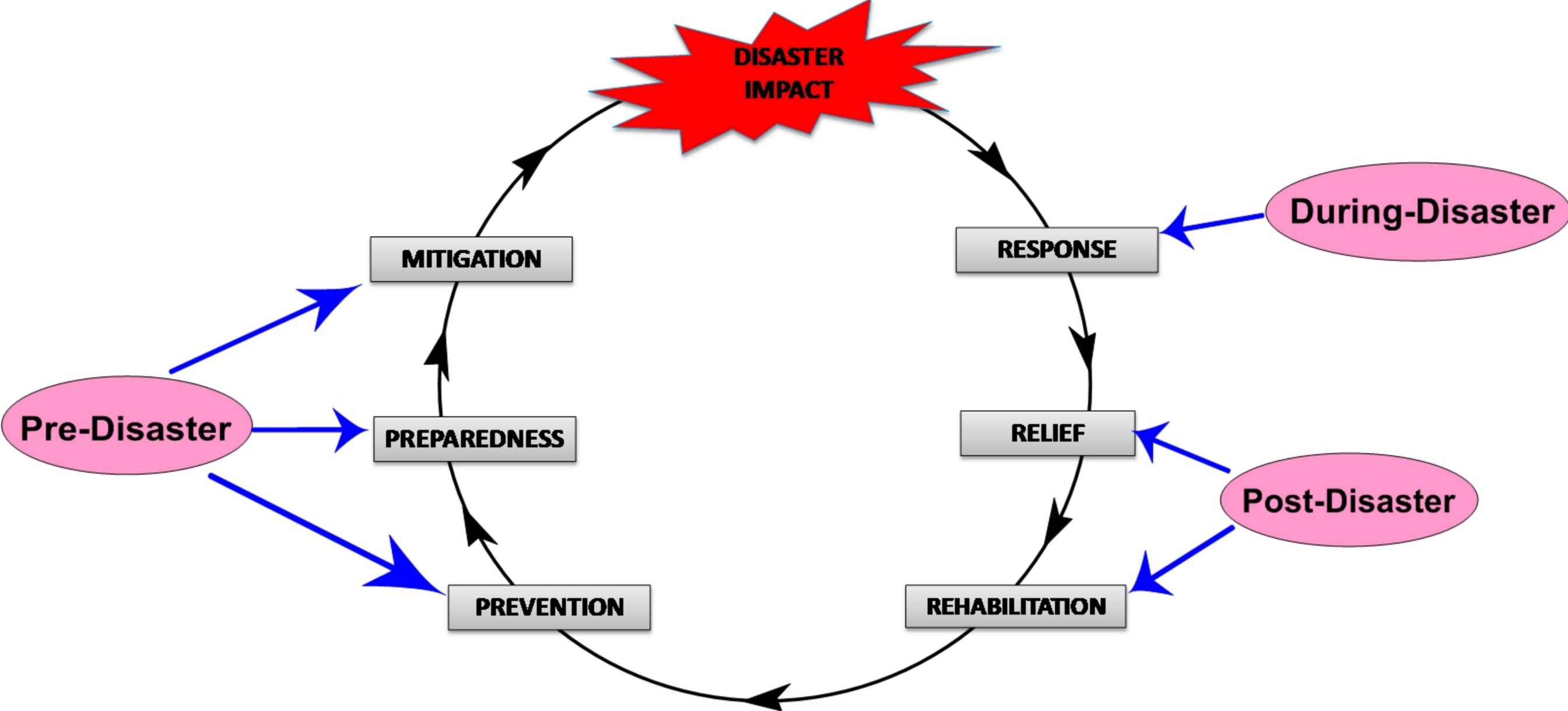
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How to Define Disaster Management

- ❖ Disaster Management has been a work of great challenge for the governments at local, national and international levels.
- ❖ Be it Earthquake, Cyclone, Flood or Landslide etc. they create tremor not only on ground but also in the hearts and minds of people
- ❖ Knowing the challenge and the urgency to nab it, disaster management has become a job prerogative of the nation.

Disaster – Occurrence of a sudden major misfortune which disrupts the basic fabric and normal functioning of a society (UN)

Phases of Disaster Management

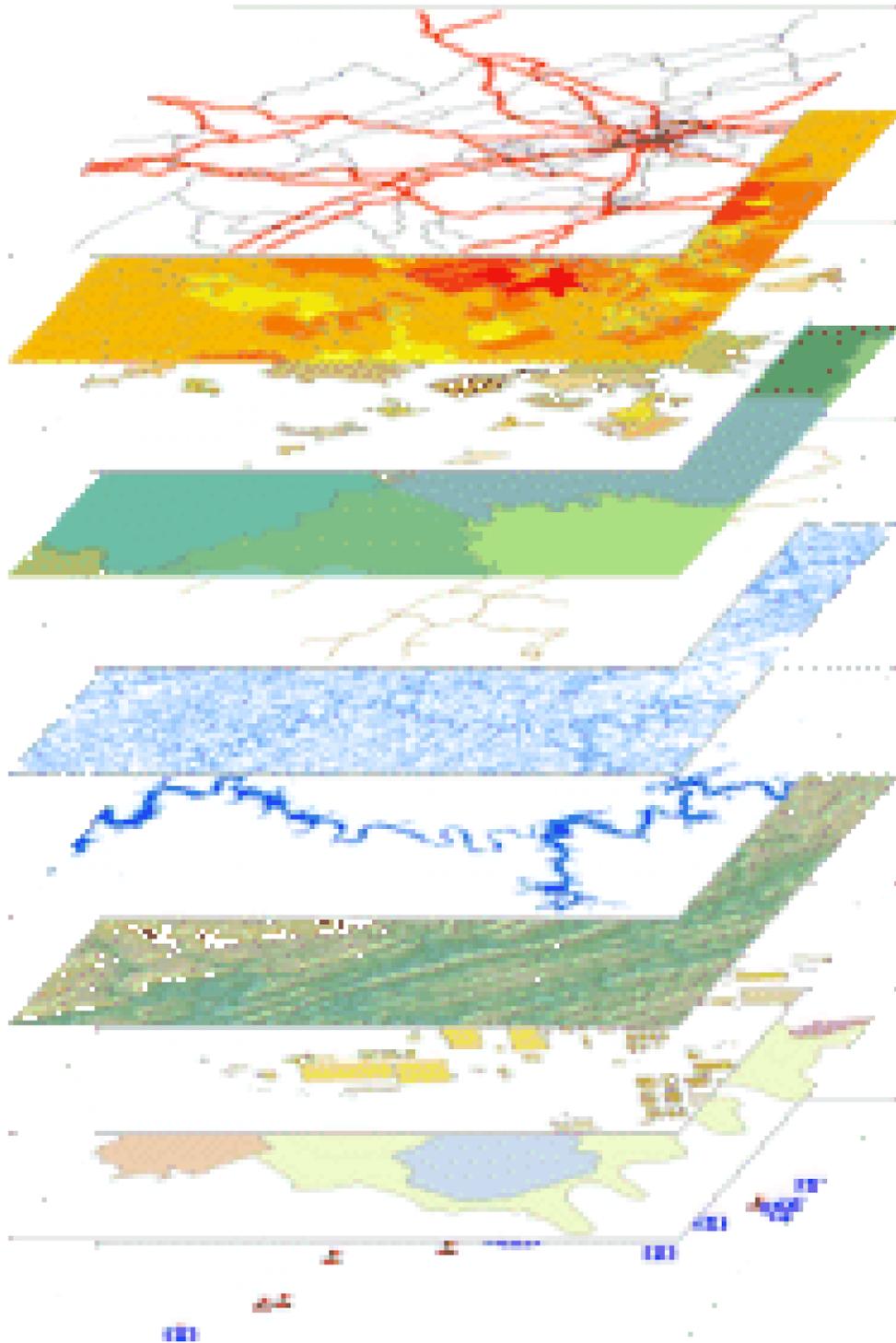


Phases of Disaster Management

There are five interrelated phases in the management of disasters namely;

- ❖ **Planning:** Analyze and document the possibility of an emergency or disaster to occur.
- ❖ **Mitigation:** Activities that actually eliminate the probability of an emergency to occur policies and by-laws
- ❖ **Preparedness:** Plans and activities to handle the emergency where mitigation has failed early warning systems, stockpiling
- ❖ **Response:** Activities following an emergency or disaster – evacuation, shelter, relief supply
- ❖ **Recovery:** Returning all systems to normal or better; short or long- term – resettlement, repatriation, re-tooling and re-integration

Why GIS ?



"GIS technology gives public safety personnel the ability to manage and analyze large amounts of location-based information.

Data (including files from legacy systems) can be stored in a geodatabase and used to visualize spatial relationships and reveal trends critical to public safety response and planning.

Computer-generated maps can be shared across a network or the Internet with multiple agencies to coordinate efforts and maximize resources."

- ❖ GIS technology is increasingly being used in decision support systems.
- ❖ In the past few years, GIS emerged as a powerful risk assessment tool and is being put to use to assess risk to property and life stemming from natural hazards such as earthquakes, hurricanes, cyclones and floods.
- ❖ Manipulation, analysis, and graphic presentation of the risk and hazard data can be done within a GIS system, and because these data have associated with location information their spatial interrelationships can be determined and used in computer based risk assessment models by decision makers for better disaster preparedness.

Why GIS in Emergency Response?

- ❖ "Preparing communities to respond to disaster threats or events should be the top priority.
- ❖ With GIS as a core component to this solution, the immediate impact will be to make GIS an integral component of the day-to-day operations of public utilities and public safety organizations."

Common Objectives

- ❖ Protection of Life and Property
- ❖ Provide Critical and timely information
- ❖ Provide the appropriate and timely response
- ❖ Provide for basic life support needs
- ❖ Provide for expedited recovery

- ❖ Common Information Framework
- ❖ Base Information
- ❖ Real Time Information
- ❖ Simulation Capacity
- ❖ Uniform Data Standards

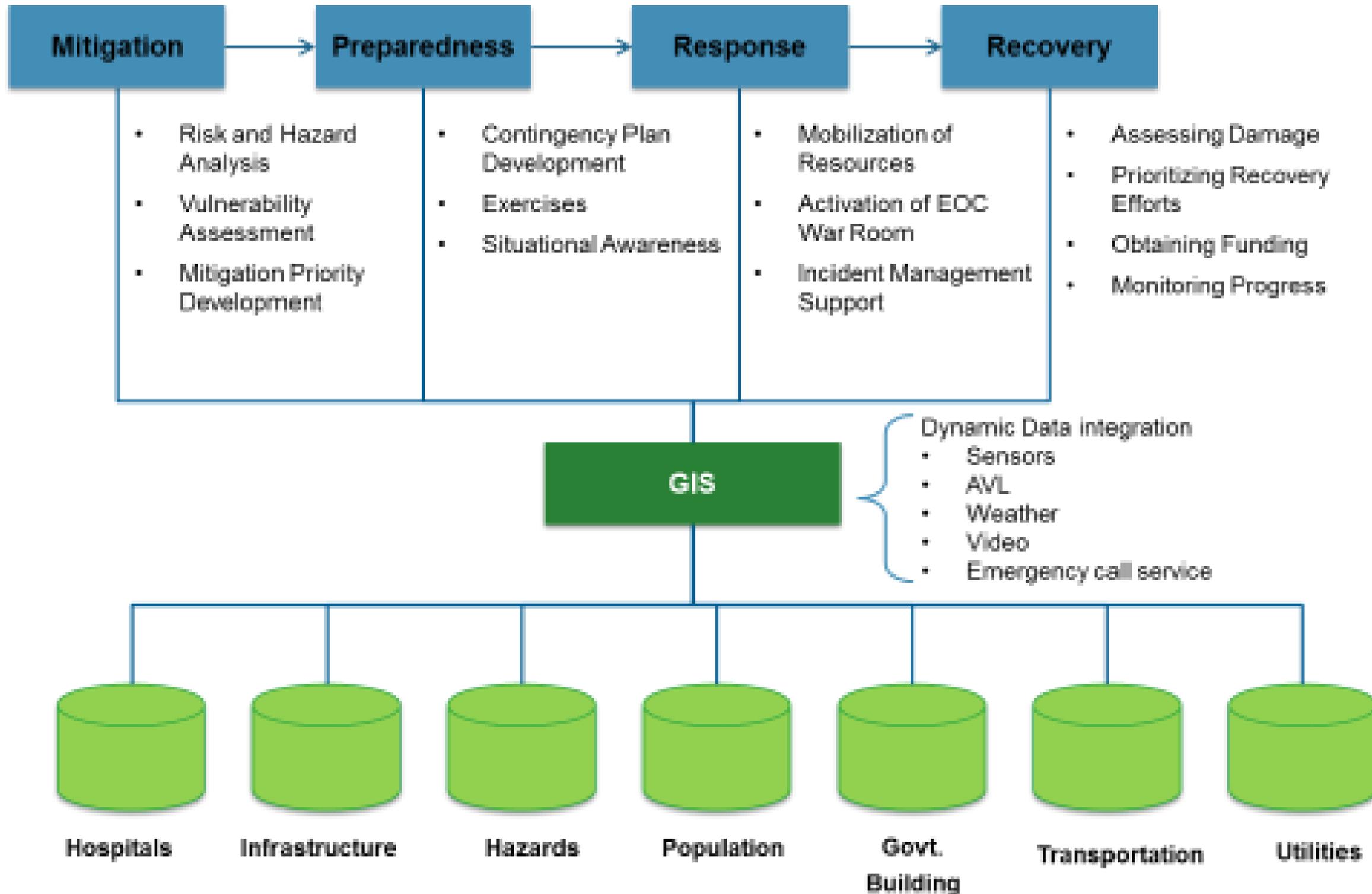
- ❖ Disaster management starts with locating and identifying potential emergency problems and how they relate to the existing environment.
- ❖ What facilities exist in impact zones, location of mitigation facilities such as Police stations, potential Shelters and Health camps, Helipads, location of medical facilities, extent of damage and infestation, water sources and any humanitarian intervention.
- ❖ GIS provides a mechanism to integrate data from a variety of sources, analyze it and present it to planners and decision makers in a quick time and reliable manner.

Brings together all the Complex Data & Knowledge



- ❖ Effective and realistic emergency management programs depend on data from various sources which should be collected, analysed, displayed, disseminated and used in an organized manner.
- ❖ It is therefore desirable to have the right data in the right place at the right time. The data should be organized in a usable format for stakeholders to respond and take action in case of an emergency.
- ❖ Most of the emergency data requirements are of spatial nature hence a need for a Geographic Information System (GIS).

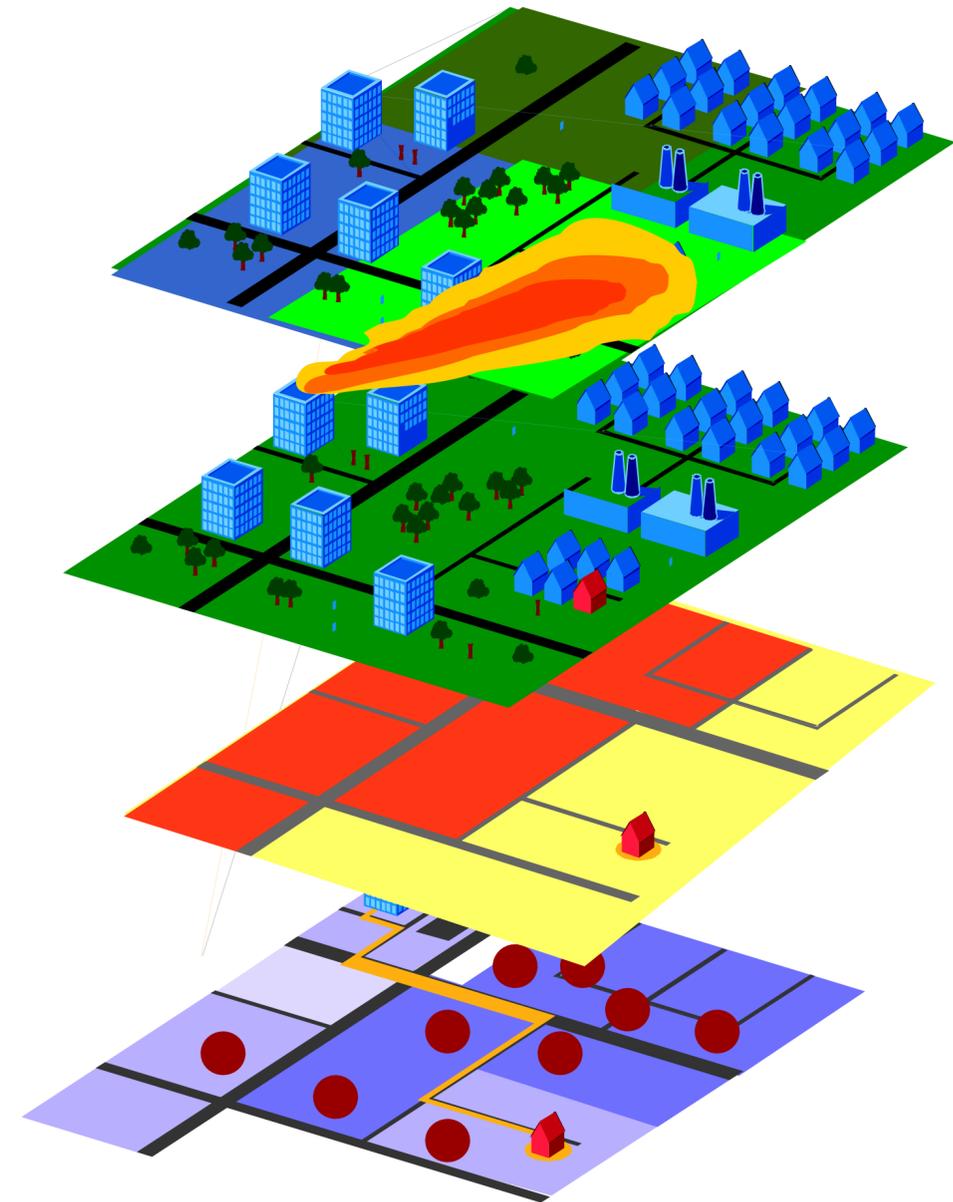
GIS for Various Phases of Disaster



- ❖ Inventory data can be stored easily in a GIS database. Data on building stock, liveliness, utilities, etc. can be aggregated into manageable geographic regions such as census wards, pin codes, or larger administrative regions such as villages, talukas, and even districts.
- ❖ Using statistical functions available in GIS systems, the average value of various properties of different building classes can be computed (e.g. average monetary value of residential dwelling in particular village) and stored with their corresponding geographic regions in the GIS database.

Event modeling to understand potential incident effects

- ❖ Locate values at-risk areas for prevention/mitigation needs
- ❖ Identify natural and Technological hazards
- ❖ Understand the geographic distribution of incidents
- ❖ Plan Mitigation efforts



- ❖ Effective planning for response involves understanding how to minimize consequences of emergencies and acquire the information and data necessary to respond.
- ❖ Depending on the nature of the emergency, every first responder requires the best data and information relevant to the risks to which they are exposed.
- ❖ Knowing where critical assets are located and having first access to key data and information, response can well planed & executed ,**this can be addressed through the purposeful implementation of GIS—digital (or geospatial) data**

- ❖ The information retrieved by querying the GIS database serves as inputs for the risk assessment models.
- ❖ These risk assessment models can run both deterministic as well as probabilistic risk assessment.
- ❖ It helps computing the damage associated with that event

THUS GIS GOES LONG WAY In CONTROL & ASSESMENT OF
NATURAL DIASTER

- ❖ Decision makers should adopt of information technologies, such as GIS, that both increase capacity and leverage existing informational resources toward prevention and preparedness.
- ❖ First responders require effective intangible information tools, to evaluate and manage risk and, at the same time, increase their overall capacity for effective response.
- ❖ Complex incidents involving multiple agencies and private organizations require the ability to create common operational pictures in an integrated manner that are capable of guiding both preparedness and response.

If a picture is worth a thousand words, then certainly an intelligent map is worth much more.

Today's GIS produces intelligent, relevant, and useful spatial (3D) information that achieves critical response missions. First responders deserve nothing less.

Lets Talk

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