INDIA GEOSPATIAL FORUM

A GIS based rapid response system for Disaster management

Sanjay Kumar
FMISC, Patna

Introduction- Defined in simple words, Disaster management is a group of activities aimed at mitigating impact of disaster on human life and property. It encompasses vigilance, analysis, recording and exchange of information on natural or man-initiated events which may turn hostile to living beings. Thus it is an ever active task; because universe never sleeps.

An effective disaster management system is run by a group of devoted workers not by employees who care more about job than about activity assigned to them. The system must work as a 24 x 7 BPO to be really effective and responsible to society. Emergency may knock your door any time so some vigilant and active people must remain wide awake every moment.

How is Disaster officially defined -   The Disaster Management Act, 2005 defines disaster as "a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes, or by accident or negligence which results in underline substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area".

What more should be covered and why – It's true that policies are made for people not individuals but for a family one person is everything if he/she is the sole bread earner. If this sole earner is in need of a help to save "his/ her" life; it's the responsibility of the government to do everything to save his life. If we look at "Disaster management" from this "individualistic" angle then bigger events can be better managed, even prevented.

Imagine a critical patient being taken to a hospital in an ambulance and it hits a road blockade arising out of a lorry collision. The traffic is almost at a grinding halt making the situation grim for the patient, Common men, in such a situation, only get annoyed and curse the administration. For the patient this is a question of life and death and a complete disaster for his family! Doesn't he qualify for DMD intervention? Is it not the responsibility of the government to keep traffic flowing smoothly because a 2 hours blockade can be a disaster for a group of women and children forming a family? A lorry collision or a vehicle breakdown in the middle of a highway may be a small incident but it may turn into a big event if a continued road jam gives rise to some sort of quarrel, stone pelting and finally setting some vehicle to fire. This has happened many times and frequency is likely to increase in all probability. Road rage is a new kind of problem knocking our doors.

To me, these events do qualify for a well planned intervention by DMD.

How things have been proposed to be organized- As per published policy documents, DMD has been organized in a hierarchical fashion from National Disaster Management Authority down to District Disaster Management Authority. All have clearly defined roles & responsibility. But unfortunately the almost entire system and activities thus defined puts more stress on exercise for underlying relief and rehabilitation although it encompasses nearly everything in connection with an intelligent approach to preparedness and prevention.

So far DMDs; at all levels are still taking shape hence don't have their own resources. They are fundamentally regulators and depend on other departments for mobilization of resources at the time of emergency.

Given these conditions and rapidly growing need for a well oiled system, following observation is being presented for a GIS based management system.

The proposed disaster management strategy- Every big disaster has a small and insignificant beginning. We fail to identify or pinpoint this tiny event. This is mainly because we don't have a database of events neither we track or analyze any event which might turn disastrous. Every monsoon we read in news papers about building collapse but we seldom care to prepare a database of such buildings. We read about fire in shops, warehouse and offices due to short circuit and loose wiring but we simply ignore the event terming it a stray incident. Stampede during religious gatherings is becoming common these days but we never analyze the sequence of events which culminate in such events.

Why don't we **map** them?

A flood always starts with rain in the catchment area of a river which itself is caused by accumulation of rain-bearing cloud. Flood is caused when volume of water is far more than the channel can handle or our protecting structures fail to contain the pressure exerted by huge volume of gushing water.

It becomes a disaster only because we fail to track and analyze every event in real or near real time. If we would have done this, we could have cautioned of a "possible flood".

Why don't we **track** them?

Nothing really changes to comply with the newly passed regulations for Disaster preparedness or public safety. If an apartment is constructed and sold to occupants, no regulation or warning is capable enough to replace a narrow staircase with a wider one. At the most the building owner is fined heavily. The building remains the same because the basic design of the building does not allow for any big alteration.

Many a multi-storey building is built on a narrow lane where a fire machine cannot reach. Still they exist like that because every such lane cannot be widened and every such building cannot be demolished or reconstructed to comply with set norms. It's not viable economically.

Then why don't we map such "hardly reachable" non-compliant structures?

What are we waiting for?

We only need to "start" working towards a smoothly working information management system for a safe living.

Any IT initiative depends heavily on the database. The initiative may not see light of the day if it lacks a well organized and complete data on the subject under question. Banking is now completely IT enabled because banks have been maintaining all information in a whole & systematic manner. IT enabling only required digitization of records. System was already in place; it only required careful programming in the software.

This unfortunately is not the case with general governance. There is no standard procedure to be followed by all government departments. Even within a department same kind of information is collected in different formats. This makes introduction of Information technology a herculean task even for a seasoned professional.

In case of a Disaster management initiative sooner we start collecting and organizing data better it will be for the system developers. Little time will be required for organizing data and a better working system can be developed.

Geographic Information system is the most suitable platform for Disaster related data collection since nearly all requisite information has an inherent spatial component to it. Till now I don't see any such system in place anywhere in India. This is only because we are too late in appreciating power of Geography in our daily life. Any disaster big or small initiates "somewhere" and affects an "area". Both are related to location. This is a clear indication that without GIS based approach Disaster Management is a near impossibility!

A system; which locates an accident site, collects information on what resources for rescue and relief is available nearby, and dispatches this information to all concerned within 20-30 minutes; would be the best IT enabled management system for Disaster mitigation, relief and rescue.

A rich database of, "what lies where" preferably in a GIS format should be prepared as soon as possible; because location is of paramount importance in Disaster Management.

This system coupled with a friendly networking among stakeholders like Police, Fire Brigade, Medical assistance, NDRF etc. will be an added advantage.

A Professional approach to problem solving is required where none should try to pass on responsibility to others.

A 24 x 7 working information collection and dissemination system is required because problems never announce their arrival. They are seen/ felt by few sensitive and alert people who may provide some useful information through any of the modern communication medium to set an alert. One should be available to collect analyze and store this information for future action.

And finally-

least interference of officials, at least till action is initiated. Let them work professionally. Hope for a safe and peaceful planet for our children.......................