GIS CAPACITY IN THE GOVERNMENT SECTOR (AN OVERVIEW ON EMERGING TECHNOLOGY)

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Abstract— This paper explores the way in which geospatial science and technology can support development, which describes its structure and scope with a overview of its application which argues that a multilevel approach is required to examine technology including the global, regional, national government and community levels .It describes each of these levels and related development in them. Sustainable urban- regional development, a response to urbanization by local governance actors and one of the most signification global processes today. Sustainable urban development impacted ranges of development issues including, food water, security, economic development accessibility to infrastructure, shelter and social services and natural risks. All of these issue have strong geospatial dimension at different jurisdiction levels which makes them approiate to examine through geographical spatial satellite laves of global position system. In deals with land administration a field whose government actor so the guarantor of fundamental property rights and land tenture security .Appropriate high speed and low cost geospatial technology could help developing countries to leapfrog towards sustainable land administration .Systems in view disaster risk management, it examines the role of GS&T in disaster relief reconstruction and rehabilitation, in hazard risk management and in disaster prepared which shows how new technology enable large numbers of volunteers to be mobilized in disaster management. The makes a number of recommendation as for steps to overcome these challenges and each des on this technology.

Keywords—Geo –spatial technology: Multi level approach: sustainable urban regional developing land administration, disaster risk management:

I. INTRODUCTION

Technology advances have in created the ease with which communities and citizens can both consume and create geospatial data, making them important players in the field. Rapid technological advances technology, robotics Nano-scale electronic engineering, web and wireless technology, laser and the infrad system and many others. In half of the 20th century, affect mankind and its life. During the part 1-2 decades new advanced hardware systems and sophisticated geospatial processing algorithm have been developed, thus affecting dramatically the traditional method for geospatial data collection and geospatial data processing with new innovation can be mentioned. Data collection Technology (photogrammetric, field surveying and GPS cartographic digitization and scanning, Radar based system and ifsar imaging, LIDAR technology).Data integration (post processing and near real time map conflation and data fusion methods of geospatial and semantic heterogeneous diverse information sources).2D and 3D DTM/raster data integration of digital terrain models, and rectified and non-rectified aerial and satellite imagery. Construction of a seamless geospatial data base, 3D- City Modeling, change Detection, urban and tracing people, crime analysis with help of database .But GS&T in a complex field in which activities table place and impart are felt at multiple levels. Earth processing, such or disaster, epidemics, climate change, deforestation solid degradation and loss of Bio-diversity do not stop at national boundaries. Following the invention of electronic computer scientists began to transform to data from paper based copies to electronic forms, trend that has transformed scientific research procedures by allowing for easy shipping and sharing information among society. The invention of computer networks in greatly simplified this sharing of electronic information among society. And the introduction of emailftp and other electronic communication protocols made computer networks a physical infrastructure that transformed how scientist, educators, government and the public exchange ideas and conduct research. The exploitation and analysis of imagery and geo spatial information to describe assess and visually depict physical features and geographical referenced activities on the earth. This is full power for the integrations and analysis of all capabilities which results in more comprehensive tailored intelligence products for a wider scope of problems and customers. This might be virtual fly through and walk through mission scenarios or map activities. .it creates a common operation by effectively using multiple intelligence, multiple data and information. This provides innovative, versatile solution for today's demanding intelligence requirements and predicating tomorrow's future threat environment

1. **Framework:**

Geo includes multiples categories of resource within a flexible scalable and expandable frame work cube, this consists of 3 components

[A] Function include both generic function and those are geospatial specific a middleware layer to bridge geospatial functions, and resources management monitoring, scheduling and other system level

function for geospatial data, knowledge, mining and geospatial function to provide various analytical function for end users.

[B] The community represents the virtual organization and end user interactions within specific communities including geographic environment of earth and other science domains. The dimension also provides feedback channels for knowledge collection functions to leverage scientific community and citizen participation.

[C] Enabling technologies provide technological support to invent, mature and maintain all functions, such as collecting data through observation and collecting and utilization knowledge.

2. **Enabling technologies':**

[A]Earth observation and sensor networks provides data collection capabilities to feed peta bytes of data sensor network also utilized to support evolution from passive logging systems to an intelligent sensors networks that actively send data sensors.

[B] Vector data modeling gives us precise representation of points, boundaries and linear features. It is helpful in analysis tasks that require accurate position for defining spatial relationship between coverage's feature (topology), important for network and detonation analysis. But boundaries are discrete whereas in reality the map polygons may represent continuous graduation or changes.

[C] Raster data modeling is a fine work for representing indistinct boundaries, and thematic information on soil types, moistures, vegetation ground temperatures. Aerial surveys user raster scanner, which \can be directly incorporated into Gis. Higher the grid resolution, the larger data files is going to be.

[D] Spatial data storage is that to determine the potential power of the system, also affect the type of analysis work, hybrid approach to storing graphical and attribute information within standard data base optimized tools for data handling, which will tend to be very efficiencies at handling files.

[E] Geospatial analysis is deriving new information from existing data, which can help us to manipulate data to solve many problems, like detecting standoff/ on bombs, missing person, anti social work, natural disaster victims, development works in urban area as well as many more works .Increasing use is made of the analytical capabilities of Gis, but many Gis project only use to manage geo graphical data.

[F] Benefits of Gis are better information management with higher quality analysis improve project efficiency, able to detect frequency, wave and detonation of concealed weapons even helpful in finding missing of kidnapped person by anti social element.

[G].GIS geographic information system in also known as a geospatial information systems which is for capturing, storing, analyzing and managing data and associated attributes which are spatially referenced to the earth. It is a computer based information system used to digitally represent and analyze the geographic feature present on the earth surface and the events that talking place on it. This can be used for scientific investigation, resource management, cartology criminology, resource amendments, carpology criminology etc…This may also helps us to calculate emergency response in time natural distress. It allows as to view and analysis of multiple cases if spatially related information associated with geographical regain. My focus or geo information technology, that includes geographical information system location based services and remote sensing image processing geo information technology is a key technology for developing nation with its most range of applications in areas such as urban management, deforestation, crime fighting etc…….

These are three main drivers' for innovation in GI technology

{a}Evolution of DBMS to handle spatial temporal data types.

{b} The availability of new germinations of earth observation satellites.

{c} The recent advances in geographical information sciences..

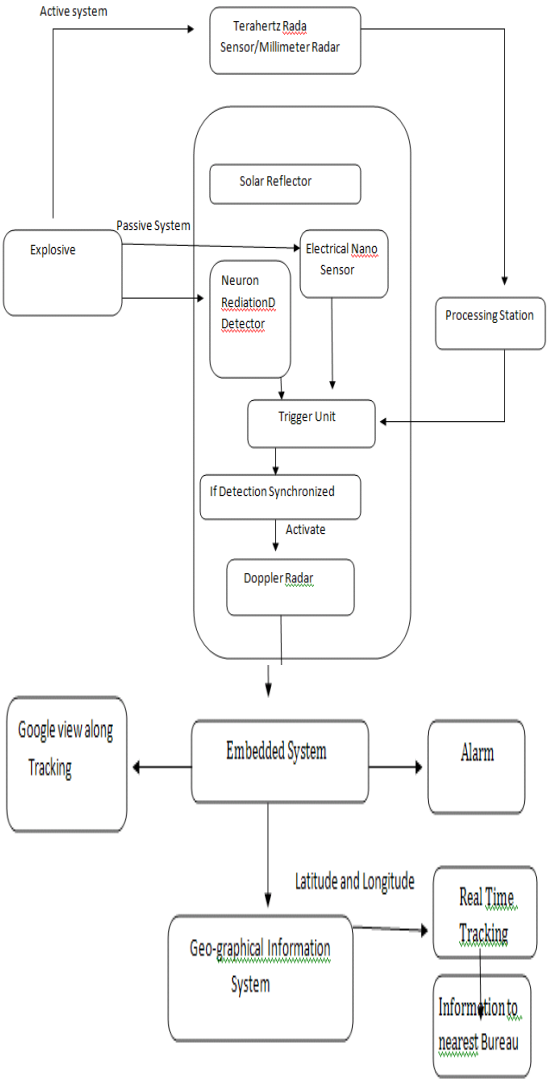
II. GEOGRAPHICAL INFORMATION SYSTEM

It is a powerful tool for showing, modeling structuring and analyzing the geo-spatial data .The position of explosive are continuously monitored by the sensor and the co-ordinates are constantly developed by the open source application(Geo server open layer, Geoevt, JavaScript and postgreSQL).the latitude and longitude from the embedded system will be updated in database and same time the geom. Updated in database with the aid of PHP scripting language .So automatically plotted the points which makes them because to trace the explosive from the origin to pass the designation .Mean while they can also find the nearest because to pans the information .Google service will be called so that the because can track the explosives along with goggle streets map for easy references .We can traces details are phone, address

and route to the nearest bureau will tracking the explosive which will help bureau to reach before explosive reaches this have done with help of dijstra Algorithms.

1 Proposed system:-

All this explosive has its own parameters and made of chemical compound. The system concentrates on the integration millimeter radar, ground sensors and web GIS to have an accurate detection of concealed explosive.



2. Embedded System

Software is used to receive data which is capture from Electrical Nano, Neuron Radiation Detection as shown in flow charts here every Sensor are connected with computer with hyper speed and controller whose program is with them in CCS complier which, makes our system connected with real time detection .It shows the amount of chemical exposed. It will plot the data in goggle earth view embedded in the software itself according to the movement of the explosive continuously and the same time it will alarm all the nearest police station……

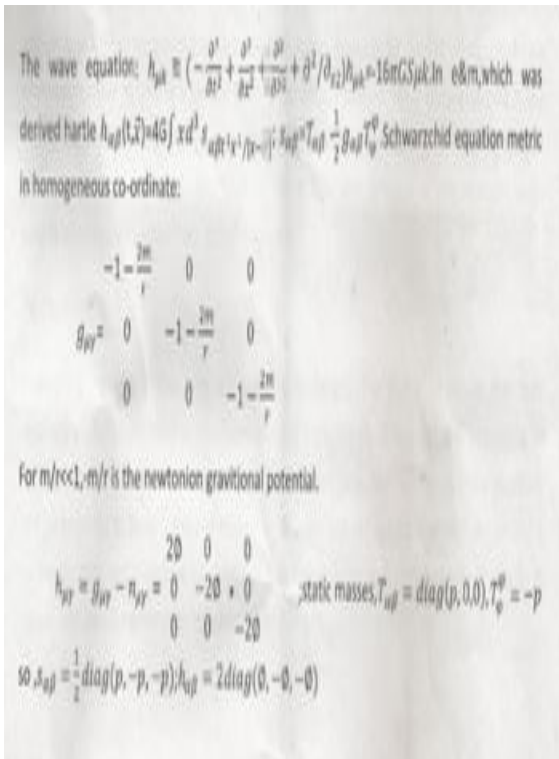
III. MATHEMATICAL APPROACH TO DETECT/ TRACE:

Sample of 1,3,5 tirinitro- 1,3,5triazacylohexane RDX explosive:

Advance in recent years have turned this technique based on coherent anti-strokes Raman scattering has given a unique and powerful tool used worldwide to probe structure and function of molecule or composite materials in biology ,neurobiology, pathology and pharmacology. This is expected to have potential applications in the field of standoff detection of foreign substance in soil/ gas or with movable objects: pump laser beam—Ws: with laser mixing a coherent beam resembling of the theory by calculation on asset of polyarematic hydrocarbons.

[A] Imaging system is convents to character isecence by radiometric temperature of the objects it contains, object email thermal radiation with an emissivity € compared with an ideal black body radiation. They also reflect a fraction r of any incident radiation, which is called the reflectivity an object, may transmit a proportion t of radiation incident on it from behind the transmissivity. For incoherent sources theses contributions are additive temperature or received temperature of an object's $=rT_1+€T_2$ $=tT_3$:T_1= Temperature of illumination, T_2= temperature of object, T_3= Temperature of background, r= frequencies, t= polarization, €= angle of incidence.

[B] **Gravitation radiation source:**



The wave equation: $h_{\mu k} \equiv \left(-\frac{\partial^2}{\partial t^2}+\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}+\partial^2/\partial_{12}\right)h_{\mu k}=16\pi G S_{\mu k}$.In e&m,which was derived hartle $h_{\alpha\beta}(t,\vec{x})=4G\int x d^3 s_{\alpha\beta}(t'x')/|x-\vec{x}'|$; $\bar{h}_{\alpha\beta}=T_{\alpha\beta}-\frac{1}{2}g_{\alpha\beta}T^{\varphi}_{\varphi}$.Schwarzchid equation metric in homogeneous co-ordinate:

$$g_{\mu\nu}=\begin{matrix} -1-\frac{2m}{r} & 0 & 0 \\ 0 & -1-\frac{2m}{r} & 0 \\ 0 & 0 & -1-\frac{2m}{r} \end{matrix}$$

For m/r<<1,-m/r is the newtonion gravitional potential.

$$h_{\mu\nu}=g_{\mu\nu}-n_{\mu\nu}=\begin{matrix} 2\phi & 0 & 0 \\ 0 & -2\phi & 0 \\ 0 & 0 & -2\phi \end{matrix}$$;static masses,$T_{\alpha\beta}=diag(p,0,0)$,$T^{\varphi}_{\varphi}=-p$

so $s_{\alpha\beta}=\frac{1}{2}diag(p,-p,-p)$;$h_{\alpha\beta}=2diag(\phi,-\phi,-\phi)$

Box 7.1 GEONETCast – low-cost access to geospatial products, services and satellite data: practical opportunities for capacity-building

GEONETCast is a near real-time global network of satellite-based data dissemination systems designed to distribute space-based, airborne and in situ data, metadata and products to diverse communities. GEONETCast is a task in the GEO Work Plan and is led by EUMETSAT, the United States, China, and the World Meteorological Organization (WMO). Many GEO Members and Participating Organizations contribute to this Task. Currently, GEONETCast applications are available for all societal benefit areas. Prime application areas are weather, water and disasters.

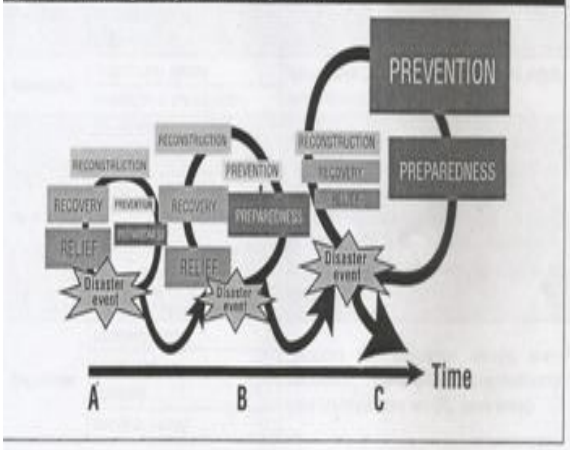
GEONETCast is a low-cost dissemination system with the additional advantage that it can be used in areas without fast and reliable Internet services, conditions which prevail in many African countries. The system is already well anchored in the meteorological community.

Processing tools are needed to exploit the full potential of GEONETCast for use by non-meteorological organizations. Several initiatives are ongoing to sustain the development of more applications. One example is the GEONETCast toolbox developed at ITC, which builds further on EUMETSAT software and enables users to import data into ILWIS GIS for further analysis. ILWIS is open source GIS software under GPL license available at 52north (http://52north.org/). At this site, the GEONETCast toolbox can also be downloaded. The number of downloads of the toolbox by interested users is steadily growing. The GEONETCast applications based on the toolbox require little resources, while all knowledge to customize applications to local needs is accessible online at no further cost.

As a result, a new community is emerging, promoting the use of free near real-time environmental and earth observations data (in situ, airborne and space-based) and derived products for worldwide use. Using inexpensive, off-the-shelf equipment, the data can be directly received from communication satellites. This capability, in conjunction with data from freely accessible archives, provides the possibility of obtaining a multitude of environmental and EO-related data. This information is highly relevant for various application domains, such as weather, atmosphere, oceans, land, vegetation, water and environment.

To allow the user community to grow spontaneously as an open network, anyone can join by using own resources to set up the system and by acquiring knowledge on how to install and operate the system and set up specific applications. With online tutorials and manuals, exchange platforms, a distance education system is available enabling anyone with basic knowledge of GS&T to engage in setting up a receiving station and start with applications.

Figure 5.2: Disaster management cycle, and its development over time



IV. OVERALL ANALYSIS:

All these performance varies from user, how used the time for the sensor to respond to mass changing the selective polymer coating lass than a millisecond, basically time depends on user how he acquainted or sampled the vapor, hardly will it take 20-120 seconds to give true response. Saw is the effective and reliable method for detection of very small mole of explosive as well as big amount of explosive compound, even can be used effectively detect chemical warfare agents in a variety of environments conditions. Geospatial revolution is the back bone of present technology which can depict or various way to trace anything in presence of his spatial capabilities to show the motion and detection of any object through advanced computer architecture and cartography.

V. CHALLENGES:

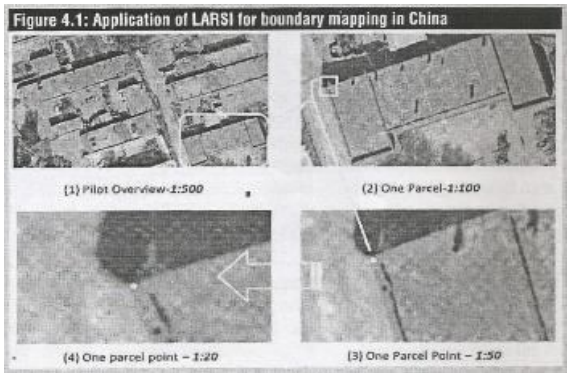
Conducting research in this area will face two challenges .The first is to ensure that their research is multidisciplinary and includes insights from the social sciences and economics as well as physics in field of quantum physics and metaphysics, such multidisciplinary approach will be essential to understand and how its application and use can be improved. An second is to handle data and their flow i.e. speed of data collection as well as complexity of circuits to detect and transfer detonation in particular instrument

VI. MY VIEWS

To address current gaps in knowledge, significant research challenges need to be tackled at nexus of geospatial and citizen knowledge. Crowd sourcing application, detection/ trace application are new, and understanding and explaining its successes and failures so that theses can be learnt from will be challenging .Interdisciplinary is essential in research, overcoming legal in situational and broader issues requires scientists, spatial planners to work with scholars from public and engineering colleges study earth and organized structure. Conference and seminar events can become more ubiquitous.

Table 5.1: Main contributions of geospatial science and technology

DRM Phase	Activity	Main GIScience and Earth Observation contribution
Relief	Damage assessment	Satellite-based damage assessment, spatial data infrastructure, automatic classification, high-resolution images, InSAR, crowdsourcing, mobile GIS applications, collaborative web-mapping, GIS databases, web-GIS, telecommunication, planning, GIS analysis
	Humanitarian assistance	
	Resources analysis	
	Logistics	
Recovery	Clean-up, restoration of services	High-resolution EO data, collaborative web-mapping, mobile GIS, Global Positioning Systems
	Rehabilitation of damaged infrastructure	
Reconstruction	Reconstruction planning	High-resolution EO data, land administration, GIS analysis, multi-hazard assessment, map updating
	Revitalization of affected sectors	
Prevention	Disaster databases	EO-derived input data, Digital Elevation Models, magnitude-frequency analysis, linking of advanced modelling tools with GIS analysis, EO-derived assets data, mobile GIS, Spatial Multi Criteria Evaluation, probabilistic risk assessment, participatory GIS, cost-benefit analysis, decision support systems, environmental impact assessment, risk atlases, web-GIS
	Hazard assessment	
	Vulnerability	
	Risk assessment	
	Physical/ structural mitigation works	
	Land use planning & building codes	
	Education, training and awareness	
Preparedness	Community planning	Participatory GIS, measurement networks, satellite measurements, change-detection, telecommunication, spatial data infrastructure, web-GIS, remote sensing
	Early warning	
	Monitoring	
	Emergency planning	



CONCLUSIONS

This paper dealt with the complete methodology to detect the explosives. Since it's a real-time mission and radar base done, government authorization and involvement is necessary. We laid radar systems in the coastal zone to acquire the weather. To validate the work, real-time radar data is required .Since that is not that much easy to have. only the methodology is discussed I this paper. Limitations are also takes place in the such as ground based sensor can be disturbed by people as it be located at road sides and Confusing gents like crackers and liquid explosives can also be detected as explosive. But the above limitations can be controlled by adopting proper designing of the project. Even though this kind of study is very popular in foreign countries: they only adopted radar systems to find out the explosives.

The methodology described above is an intergraded one which is not still followed even n developed countries. If the project is designed perfectly and comes into real-time, will bring out a new revolution in the field of Remote sensing, embedded system and GIS.

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