

**Assessing Existing Spatial Data Infrastructure (SDI) Framework for Disaster  
Management (DM) In West Africa  
A Case of Spatial Infrastructure Access By The Emergency Management  
Agencies In Nigeria.**

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**ABSTRACT:**

**Introduction**

In recent times, global efforts in disaster management are directed towards the reduction of vulnerability and risks in the event of likely disasters, the arrangements for relief and recovery is planned for only as a last resort. In this paper, an in-depth investigation is carried out to ascertain the level of existing spatial data infrastructure framework that exist in some part of the West African Sub region and can facilitate effective mitigation against possible disasters. The occurrence of large scale disasters in many African countries constitutes a bane of advancement in the continent. The wide spread magnitude of damage and loss to lives and properties has given rise to the intensive search for spatial data frameworks that will provide data and other spatial oriented resources to support risks and vulnerability assessment. This search has become imperative and unavoidable. Fortunately, the several factors for the measurement of spatial data quality as mentioned by <sup>1</sup>Voigt et. al., 2006 sets a standard to measure the fitness of available resources and the possibility of including such information to facilitate disaster management and mitigation. Some salient elements of spatial data quality such as timeliness and availability of imageries covering areas of disaster areas will be a critical focus in this research. Also the availability and human capacity to integrate these resources is also evaluated to determine whether the existing SDI framework applicable in the study area sufficiently facilitates disaster mitigation activities.

**Statement of Problem**

Disaster is an inevitable component of our dynamic planet earth. Natural disasters may be inevitable but the increasing number of man made disasters has increase the necessity for comprehensive and cooperative action to mitigate the occurrences of the combinations of these different types of disasters and also to minimize their consequences. The use of Remote Sensing and Geographic information science and systems have been growing in application and variation in the management of both localized and wide spread environmental issues. This increase and dynamism of spatial information systems have created an opportunity to harness the available resources for the purpose of effective disaster management. The problem of the slow or unimpressive adaptation of remote sensing and GIS techniques for disaster management in most African sub-regions gives rise to the need to investigate the level of the existing spatial data infrastructure framework and how it is being used to support DM activities. The research investigates the causes of the weakness,

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<sup>1</sup> Preferred email

inexistence or inaccessibility of the components of spatial data infrastructure (SDI) for the various processes of disaster management circle.

### **Aim and Objective**

In the long run, the discovery, access and processing model derived by this research works as a guideline for the efficient utilization of geospatial information for disaster management purposes. The research utilizes questionnaires, personal interviews and archival records to determine the state of the existing SDI framework for disaster mitigation and management in Nigeria. Also, the ease of accessing information from regionally owned satellites for cost efficiency (both money and time) in DM related activities is also evaluated. The test case used is the perennial flooding in Yobe State, in Northern Nigeria. This is a major flooding event which occurs yearly. In the assessment of this case, the potentials of SDI frameworks and geospatial application have not been evident in all the disaster management stages. The investigation establishes the level of availability and application of the relevant fundamental and thematic datasets for this location.

### **Areas of consideration:**

Focusing on perennial flooding in Nigeria is used as a focal point since this is a disaster in Nigeria being constantly addressed by the National Emergency Management Agency (NEMA). NEMA is the primary body conferred with the responsibility of coordinating DM activities in Nigeria. In determining the effectiveness of SDI, investigation is patterned after the establish DM cycle which consist of preparedness, disaster event, relief, rehabilitation, reconstruction and mitigation as explained by <sup>2</sup>Kerle, 2007. The SDI database specification ensures the effective functioning of a clearinghouse facility which is the back bone in SDI framework. In establishing relevance of the Nigerian database(s) a peripheral comparism is carried out between the existing SDI framework in Nigerian and the framework specifications required for the same purpose in the European SDI project.

### **Results**

The investigation reveals a low understanding and therefore an insignificant application of the existing incoherent SDI framework for the purpose of disaster management. Through this research, a process model to identify, access and process geospatial data for the purpose of DM was developed. This model used the flooding event in Yobe state in Nigeria as a case study. Also from investigation it is observed that the existence of the regionally owned satellites, in this case the NigeriaSat1 project has not sufficiently facilitated the functionality of the SDI framework in Nigeria.

### **References:**

[1] Stefan Voigt, Thomas kemper, et. Al., 2006; *Satellite Image Analysis for Disaster and Crisis-Management Support*. IEEE Transactions on Geoscience and Remote Sensing. Vol 45, N0 6

[2] Norman Kerle, 2007; *Spatial Data Infrastructure for DM*, Refresher course on building disaster management capacity with regionally owned satellites.