

REAL TIME SPACE REMOTE SENSING DATA AND GIS FOR OIL SPILL DISSASTER MANAGEMENT IN NIGERIAN NIGER DELTA: A CALL FOR PARADIGM CHANGE.

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ABSTRACT.

The paper examines the nature of oil spill disaster in the Niger delta and identifies the contribution of real-time space remote sensing data to the contingency planning and rapid response to oil spill disaster in the Niger Delta. An oil spill disaster organgram/ model is presented

1. Introduction.

Oil spill disaster has been a major concern in the Niger delta of Nigeria. It is a major source of agitation and a threat to national unity and survival. It generated crisis between the oil companies and the host communities. The Nigerian government has made several attempts to resolve the crisis, which escalates by the day , the approaches are however fraught with many discrepancies. The paper examines the nature of oil spill disaster in the Niger delta and identifies the contribution of real-time space remote sensing data to the contingency planning and rapid response to oil spill disaster in the Niger Delta. An oil spill disaster organgram/ model is presented.

2.. Sources Of Oil Spill Disaster In Nigeria.

Crude oil spill disasters are due to very many factors such as oil well blow – outs, burst and leaking pipelines or flow stations, overpressure failure and overflow of process equipment components, hose failure, failures along pump discharge manifolds, sabotage to well heads and flow lines (Nwankwo and Irechukwu, 1981).

The principal factors at play in oil spill at the Niger delta can be broadly classified into three major groups.

- *Equipment failure due to ageing and malfunctioning of systems*
- *Act of sabotage*
- *Negligence on the part of operators.*

3. Environmental Effects of Oil spill in Nigeria

The effect of crude oil spills in the Nigerian environment have been reported by very many investigators among whom are Ekekwe (1981), Baker (1981), Oteri (1981), Idoniboye (1981), Amajor (1985), Powell et al. (1985), Ekweozor and Snowden (1985), Afolabi *et al* (1985), Odu *et al* (1985) and Fabiyi (2001b).

When oil comes ashore it kills shore animals by smothering them, or if sufficiently fresh, kill them because of its toxic constituents. Oil taints fish and interferes with fishing activities and navigation.

Spilled oil makes a great mess. Polycyclic aromatic hydrocarbons in crude oil may be toxic, carcinogenic and teratogenic.

Whereas the sea has enormous capacity to absorb the various attempts by man to degrade it, the streams, creek, rivers, estuaries, swamps and land have only a little capacity to do so'. (Fabiya 2001b).

4. Problems Associated With Oil Spill Disaster In Nigeria.

The devastating effects of oil spill disaster in Nigeria have long defiled comprehensive solution especially as there are many unresolved issues on the management of oil spill disaster. The issues can be briefly described as follows.

- Oil spill takes time before it is detected and reported to the appropriate agencies.
- The response time is too long to allow effective quick cleanup.
- Substantial parts of oil spill are caused by act of sabotage and vandals in attempts to claim damages.
- The methods of cleanup and emergency response are not only obsolete they are ineffective.
- There are discrepancies in the claim of communities and the estimated damages from the operating agencies.
- There are suspicion by the host communities of the possible cover up of spill by oil companies (and thus avoid heavy compensation) if the latter (oil companies) want to respond promptly to oil spill.
- The nature of terrain and the characteristics of oil spill areas cannot be ascertained by the oil companies to send clean up team on time and to fix the price of spill clean up
- There is mistrust from the oil companies on the integrity of their contract staff (whom they accused of framing oil spill to claim allowance). (See Fabiya 2001a).
- New and emergency villages spring up at the oil spill site overnight in order to claim damages.

5.Potentials Of Space Remote Sensing In Oil Spill Disaster Management In Nigeria

The synergy between remote sensing and GIS data is logical due to the nature of the data present with each information source. Remote sensing provides spatially explicit measurement of phenomena, while geographic information is produced through the analysis of measurements or other geographic data (Davis and Simonett, 1991). These can be integrated in broad-based geographic information systems. The ability to combine remotely sensed and GIS data has enabled the generation of new data based upon characteristics unique to each data source and thus adequate for effective management of spill. (See Fabiya 2001a

The potential use of Space remote sensing in oil spill disaster management include the following;

Susceptibility and vulnerability analysis of the oil spill hot spot areas

Analysis of potential environmental effects (impacts), Analysis of terrain characteristics and the influence on clean up, Oil spill disaster modelling and post disaster evaluation of spill areas.

Prompt detection of oil spill, Orbital satellites remote sensing are especially important for spill detection, damage assessment, compensation estimate, and modelling of oil spill. Radar would be required at the period of cloud cover.

The New Paradigm.

Sequel to the above We propose a new organisational structure to manage oil spill in the niger delta region which can be presented as follows.

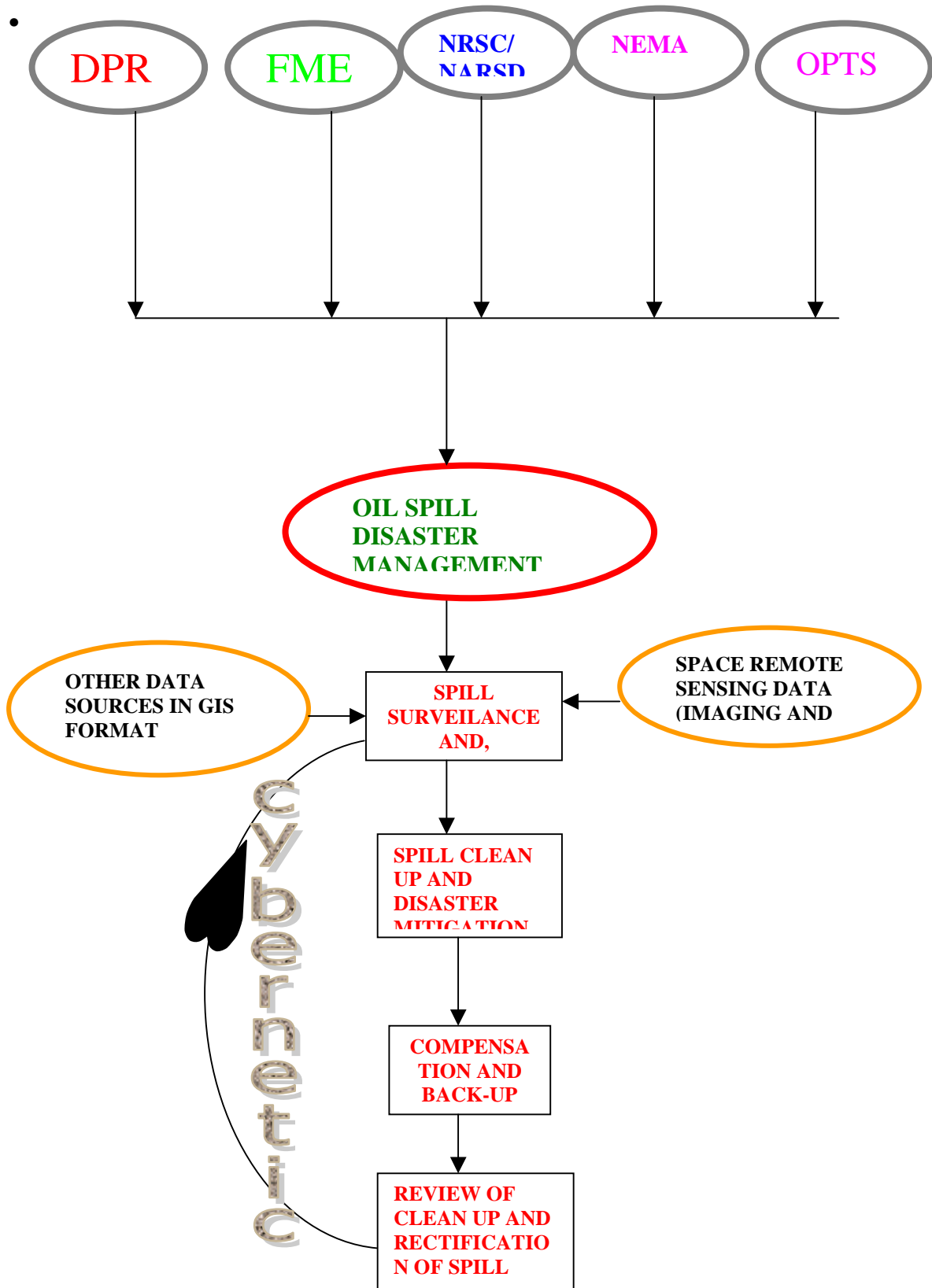


Figure 1: organogram/model of proposed oil spill disaster management in the Niger Delta

7.CONCLUSION.

The new paradigm include a joint effort of various organisation and agency that are involved in disaster management hat will adopt space remote sensing in handling oil spill disasters in Nigeria.

This approach would lead to effective monitoring of Niger Delta Region by an independent body with undeniable proof through Space remote sensing.The use of space remote sensing allows regular update of spatial data and thus will resolves the controversies of damage estimates. With regular monitoring compensation can be estimated through desktop analysis. Once oil spill occurs the communities become agitated and the spot become inaccessible and dangerous to on the site values.