STRATEGIC USE OF GIS IN CONTROLLING PIPELINE VANDALISM OF OIL AND GAS INDUSTRY IN NIGERIA

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DEDICATION

To my late Father, Mother and beloved Wife

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ABSTRACT

Nigeria is among the top ten nations of the world that is endowed and blessed with oil and gas. However, the oil and gas industry has contributed a lot in generating revenue to the country but unfortunately that has not impacted much to the social and structural developments of the people in Nigeria. Level of poverty increased which led to high rates of crime and criminal behaviors like petroleum pipeline vandalism that is common in the oil communities in delta state of Nigeria. This type of crime is mostly committed by the jobless youth who are looking for alternative means to success. The aim of this study is to investigate the potential use of GIS as a strategic tool for oil and gas industry for controlling pipeline vandalization in the oil communities of Jesse, Ekakpamre, and Oviri in delta state of Nigeria with objectives set to support the aim of study. GIS techniques were used and it abilities were demonstrated in controlling petroleum pipeline vandalism using ArcGIS 10.2 software. The analysis used includes hotspot analysis, kernel density analysis and proximity analysis, and hyper link to show the photographs of the vandalism incidents. In addition, pattern of vandalism incidents in the form of pie and bar charts. The results of this study proven that GIS can be used as a strategic tool for oil and gas industry as well as it can be a useful tool for decision makers to plan, control and monitor the pipeline vandalism in Nigeria.

ABSTRAK

Nigeria merupakan antara sepuluh negara tertinggi di dunia yang dikurniakan dan diberkati dengan minyak dan gas. Walau bagaimanapun, industri minyak dan gas telah banyak menyumbang dalam menjana pendapatan untuk negara tetapi malangnya ianya tidak memberi kesan kepada perkembangan sosial dan struktur penduduk di Nigeria. Tahap kemiskinan yang meningkat telah membawa kepada kadar jenayah yang tinggi dan tingkah-laku jenayah seperti vandalisma terhadap paip petroleum dan gas dalam masyarakat minyak di Negeri delta, Nigeria. Jenayah jenis ini kebanyakannya dilakukan oleh golongan belia yang menganggur yang mencari cara-cara alternatif untuk memenuhi inspirasi dan cita-cita mereka. Kajian ini bertujuan untuk menyiasat potensi penggunaan GIS sebagai alat strategik untuk industri minyak dan gas bagi mengawal vandilisma paip petroleum dan gas dalam komuniti minyak di Jesse, Ekakpamre dan Oviri dalam negeri delta, Nigeria dengan objektif-objektif yang ditetapkan untuk menyokong tujuan kajian. Teknik GIS telah digunakan dan kemampuannya telah ditunjukkan dalam mengawal vandalisma paip petroleum menggunakan perisian ArcGIS 10.2. Analisis GIS yang digunakan termasuklah analisis hotspot, analisis ketumpatan Kernel proximiti dan Hiperlink untuk menunjukkan gambar-gambar kejadian vandalisma. Selain itu, pola kejadian vandalisma dalam bentuk carta pai dan carta bar. Keputusan kajian ini membuktikan bahawa GIS boleh digunakan sebagai alat strategik untuk industri minyak dan gas serta ia boleh menjadi alat yang berguna untuk pembuat keputusan untuk merancang, mengawal dan memantau vandalisma paip petroleum dan gas di Nigeria.

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AM/FM	Automated Mapping / Facilities Management
BC	Before Christ
CAD	Computer-Aided Design
CNDOD	Coalition of Niger Delta Organizations in Diaspora
DPR	Department of Petroleum Resources
FBI	Federal Bureau of Investigation
GIS	Geographical Information System
GMT	Greenwich Mean Time
GPS	Global Positioning System
G&G	Geophysical and Geological Data
IMS	Infrastructure Management Systems
INS	Inertial Navigation Systems
MC	Multinational Companies
MNOCS	Multinational Oil Companies
NAOC	Nigerian Agip Oil Company
NDDC	Niger Delta Development Commission
NDVF	Niger Delta Volunteer Force
NNPC	Nigerian National Petroleum Cooperation
OPEC	Organization of Petroleum Exporting Countries
ROW	Right of Way
SDSS	Spatial Decision Support Systems
SPDC	Shell Petroleum Development Company
USA	United States of America
USEPA	United States Environmental Protection Agency

WCPD	Wealth Creation Preservation and Dona