

SYMPOSIUM ON INTEGRATED APPLICATIONS (B5)
Integrated Applications End-to-End Solutions (1)

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somohed@yahoo.com;info@nasrda.gov.ngGEOSPATIAL ASSESSMENT OF GULLY EROSION PROGRESSION AND VULNERABILITY
MAPPING IN AGULU-NANKA AREA IN ANAMBRA STATE.**Abstract**

Gully sites in many parts of South Eastern Nigeria are a threat to sustainable livelihood in the region. Part of the problem is a poor understanding of the dynamics of the phenomenon in time and space. The general objective of this study is to evaluate the dynamics of Agulu-Nanka gullies over a period of 40 years, and assess the relative vulnerability of the area to gully. Primary and secondary data which contain both spatial and non-spatial attribute was used for the study. The primary data were collected with the use of Global Positioning System (GPS) receiver, while field work and measurements were carried out to determine the characteristics of the gullies. The secondary data include soil, Geology and 1:50,000 topographic maps, as well as multi date satellite imageries of the area including: LandSat TM and ETM, of 1986, 1996, 2001, SPOT 2005 and Nigeriasat1 of 2010. The geo-data sets were processed and analyzed using Geospatial techniques including: image classification, weighted overlay computation, 3D terrain analysis, and geo-statistical spatial analysis. The integration of the different thematic data sets using Weighted Overlay Multi- Criteria Analysis was used to produce the vulnerability map of the study area. The results of the computation revealed noticeable changes in the gully area between 1970 and 2010. The gully area increased from 10.9kmsq in 1970 to 16.8kmsq in 1986 and to 24.9kmsq in 1996 with 5.9 and 8.08kmsq positive magnitude of change respectively representing the land gain by the gully from other landuse. Between 1996 and 2001 there was a decrease in the gully area from 24.9 to 21.3kmsq with -3.57 and 3.57kmsq magnitude of change representing land lost by gully and land gain from gully to other landuse classes due to mitigation measure put in place then to fight the gully spread. In reversal, between 2001 and 2006 there was a gradual increase of the gully area from 21.35 to 22.27kmsq representing 4.3% increase with 0.92kmsq magnitude of change and further increase to 34.42kmsq in 2010. The multi-criteria analysis result show that about 85% of the study area is classified highly vulnerable based on the interplay of different criteria while the performances of the adopted measure are relative but successful in area with gentle slope characteristics. The study concluded that the gullies are active, expanding with alarming annual frequencies and positive magnitude of change. This has increased the vulnerability of the entire area to gully erosion