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***Full Length Research Paper***

# An appraisal of the impact of petroleum hydrocarbons on soil fertility: the Owaza experience

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## Abstract

Major fertility indices - N, P, K, TOC and TOM contents - were examined against the backdrop of physico-chemical conditions of pH, temperature, moisture content and electrical conductivity of soils three months after oil spillage at Owaza in the Niger Delta region of Southern Nigeria. Evidence of severe hydrocarbon contamination was provided by high extractable hydrocarbon content of $3.4 \times 10^3 - 6.8 \times 10^3$ mg/kg. High soil acidity (low pH of 4.9 – 5.1), low electrical conductivity as well as high temperature and moisture content, all provided evidence of reduced metabolic activities on the affected site which explains the relatively low TOC/TOM values obtained. These conditions generally imply low soil fertility, which in turn implies low agricultural productivity and reduced source of livelihood in the affected area. Based on the results obtained, contingency/remedial measures should include the application of appropriate and sufficient inorganic NPK fertilizer to restore the carbon to nutrient ratios to the optimum required to stimulate and sustain microbial activity; adjustment of the pH to 6.0 – 6.5 by the addition of calcitic lime; stimulation of indigenous microbial growth by cultivating the soil to distribute the nutrients and lime and appropriate aeration of the treatment zone.

**Key words:** Owaza, petroleum hydrocarbons, oil spillage, primary macronutrients (N, P and K); soil fertility.