

**INCORPORATING ENVIRONMENTAL COSTS INTO  
NIGERIAN OIL AND GAS ACCOUNTING**

**BY**

**AMOS AKINTOLA OWOLABI  
B.Sc. (Ife), MBA (Lagos), M. Phil. (O.A.U.)**

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**ABSTRACT**

This study evaluated the extent of awareness and protective measures by stakeholders of environmental costs in the Nigerian oil and gas industry. It also identified and assessed the environmental factors in the industry that need to be accounted for. These efforts were with a view to developing an accounting model for measuring environmental costs in the industry.

Data were obtained through two sets of questionnaire survey. The first set evaluated the extent of awareness and protection measures of environmental costs in the oil and gas industry using a 5- point Likert scale. The second set focused on the identification, assessment and evaluation of the perceived impacts of environmental factors by stakeholders in the oil and gas industry. Forty-two environmental variables obtained from literature and confirmed by experts in the industry were included in the survey questionnaire. Out of a population of 3,200; 540 respondents were selected through stratified purposive sampling from the relevant stakeholder groups. These included accountants, engineers, scientists, health officers, environmentalists and other managers from the five upstream and eight downstream oil companies, one state ministry of environment from each of the eight oil producing states, Federal Ministry of Environment, oil community, oil services companies, Nigerian National Petroleum Corporation, Department of Petroleum Resources and Non-Governmental Organizations. Data from the survey were subjected to descriptive and inferential statistical analyses/secondary data on estimates of revenue and costs associated with recently completed/on-going oil sites were obtained from the records of the stakeholders. These constituted the input data set used in developing the accounting model. In addition to this data set, the forty-two environmental variables

identified in the second questionnaire were parsimoniously reduced to a five-factor solution using factor analysis.

The results of the study indicated that the respondents demonstrated a high degree of awareness of environmental issues in the industry (overall mean rating of 4.41 out of a maximum of 5.00 on a Likert scale) and a positive attitude towards environmental costs and liabilities (overall mean rating of 3.51). From the forty-two environmental variables, a five-factor solution with their factor loading was obtained from the factor analysis. These were:  $X_1$  = 'impact on public health (7.95%)',  $X_2$  = 'occupational health impact (39.04%)',  $X_3$  = 'impact on agricultural produce (3.24%)',  $X_4$  = 'marine and fresh water impact (5.5%)', and  $X_5$  = 'building and infrastructural materials (11.07%)'. These five factors were employed to develop a multi linear regression accounting model:  $S = 1758.4325 + 3.9460496X_1 - 28.07389X_2 + 7.3036634X_3 + 0.5642708X_4 + 23.019651X_5$ , where,  $S$  was revenue and  $X$  was costs. The developed model was later validated using 10 sets of virgin data. The result indicated low percentage deviation of the model from the actual values (largely within  $\pm 15\%$ ). Also the standard measures of accuracy of the regression model were high ( $R^2 = 0.937$ ;  $F = 86.8$ ;  $P < 0.05$ ) suggesting its high predictive ability.

In conclusion, the study showed that there was a high degree of awareness to environmental issues and a positive attitude towards environmental costs and liabilities in the Nigerian oil and gas industry. The result also concluded that environmental costs could be incorporated into a revenue accounting model.