

World Bank African Centers of Excellence (ACE) 8 Million Dollar research award for Pan African Material Institute (PAMI) Abuja Nigeria

PI at OSU: Alfred B O Soboyejo, Department of Food, Agricultural and Biological Engineering

This collaborative research award will be shared by Department of Food, Agricultural Engineering, The Ohio State University, along with 18 other top rated participating universities worldwide. This research award will bring PhD students from participating institutions worldwide during the period of award at OSU. Students will learn modern techniques of mathematical and statistical methods with applications in materials and bio materials. The student will also be encouraged to write peer reviewed journal papers based on research activities at OSU and participating institutions.

Focused Research Areas at OSU would be:

Material Strength characterization in building materials such as concrete and land creek

This new research project will outline and develop comprehensively new mathematical models that can be used to characterize strength of cement materials from concrete to land creek, with or without other additive materials or chemicals which can increase the strength of concrete with time.

Corrosion in Materials: Water, Gas and Oil pipelines

This new research project will develop new techniques to model corrosion accurately, so that adequate precautions can be taken to reduce the detrimental effects of corrosion anywhere. New multi-parameter stochastic methods will be developed to capture corrosion as a response variable in terms of material and other environmental variables that can be regarded as predictor variables for corrosion.

Water purification using available simple materials such as sand filters, clay filters, porous, and plastic materials

The huge incidences of water borne diseases had reached alarming proportions particularly in all developing countries. The present research would be a continuation of earlier research carried out by Alfred Soboyejo and others during the last 7 years. This new water purification method will be used to develop new materials with mathematical models to characterize filtration capabilities for household uses, rural uses and small cities.

Strength characterization in rubber which can yield high quality rubber in 8 months instead of 8 years from existing rubber trees

This research will focus on producing raw rubber materials to reduce the huge demand for rubber in many countries. The supply of high quality is much less than demand for high quality rubber everywhere. The economic significance of this research is therefore very great.

Development of novel and statistical models for the above which can yield predictors from complete independent response variables. Several practical examples will be solved by analyzing real life field data sets. The new models will have universal applications in many engineering and biosystems engineering problems.