Date of Submission	1st September 2017

IPL Project Proposal Form 2017

(MAXIMUM: 3 PAGES IN LENGTH)

1. Project Title: **Landslides in Africa: Understanding catastrophic failures and effective preventive measures in vulnerable regions of the continent**
2. Main Project Fields

   Select the suitable topics. If no suitable one, you may add new field.

   (1) Technology Development

   A. Monitoring and Early Warning, B. Hazard Mapping, Vulnerability and Risk Assessment
3. Name of Project leader OGBONNAYA IGWE

   Affiliation: UNIVERSITY OF NIGERIA, NSUKKA

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   Core members of the Project Ogbonnaya Igwe; ikenna Okonkwo; Okechukwu nnebedum; Ifeanyi Oha Names/University of Nigeria, Nsukka
4. Objectives: to integrate new methods in solving the increasing trend of catastrophic landslides in Africa

Background Justification: **Catastrophic landslides are increasing in Africa. The recent Sierra Leone and DR Congo landslides in August 2017 have claimed over 600 lives according to reports. Experts predict that any more catastrophic landslides will still happen if the increasing rainfall trends and urbanization activities remain unabated. We think that unless some drastic measures are taken even Conakry, the capital of Guinea may experience similar slope movements in future. Our sustained IPL projects in the past eight years in West Africa have yielded new methods of dealing with old problems of landslides in the region. The new methods include the use of high resolution satellite images, state-of-the- art structural analysis, quality geophysical procedures, improved geological and geomorphological investigations, and high level field surveys. Our results have shown that the integration of these methods yield better landslide prevention and mitigation.**

5. Study Area: Nigeria, Cameroon, Sierra Leone, DR Congo, Uganda, Guinea, Mali, Ghana and Benin Republic
6. Project Duration: 5 years
7. Resources necessary for the Project and their mobilization

   Personnel, Facilities, and Budgets: The task ahead is quite tough. We intend to build a comprehensive synergy across major Universities and Research Institutes across Africa. We have already started in this direction and we hope to achieve our goal by the first and second quarter of 2018. Dong this and securing all the data we need to produce landslide susceptibility map for Africa would cost at least $ 200, 000 USD. However we would like to start with as little as $ 5, 000 USD. Our Department is a Centre of Excellence in landslide research so we are confident we would be able to achieve our

objective of research.

8. Project Description: **Global warming and climate-driven changes have brought increased rains in several parts of Africa. Many of the slopes in the continent are distressed. They have been predisposed to failure by severe weathering, tectonic activities and the mounting pressure of urbanization. When the increasing amount of rainfall act as trigger the result is expected to be catastrophic. Sierra Leone, DR Congo, Uganda and Nigeria have witnessed recent landslide catastrophes. In a poor continent where poor urban planning, destabilization of slopes during farming or construction activities are the norm, an effective landslide preventive measure is highly desirable. It is also widely known that because of economic challenges in Africa poorer people live at the foot of the most vulnerable hills. We hope to produce a landslide susceptibility of Africa at the end of the project.**
9. Work Plan/Expected Results: We intend to integrate extensive field work with satellite imagery, laboratory analysis and geophysical study to understand the catastrophic landslides, and evolve an effective preventive measure. Our Research Group collaborated with Reuters in the recent Sierra Leone landslides. We in intend to build on similar collaborations as our work progress. We hope to carry out rigorous investigation of landslide susceptibility in Nigeria, DR Congo, Sierra Leone, Guinea, Uganda, and other mountainous regions in the continent. We will also collect samples for laboratory analysis. Finally we would be able to publish the first landslide susceptibility map for Africa.
10. Deliverables/Time Frame: We will discover effective, low-cost preventive measures for Africa, produce the first landslide susceptibility map for the continent, and ensure adequate housing plan in some vulnerable areas. These would take at least 5 years.
11. Project Beneficiaries: Africa and some others who may use our results
12. References (Optional):

1. Our collaboration with Reuters may be accessed on: http://www.reuters.com/article/us-leone-mudslide-africa/cities-across-africa-face-threat-of-landslides-like-sierra-leone-idUSKCN1AY115
2. Igwe O, Onwuka S, Oha I, Nnebedum O (2016) WCoE/IPL projects in West Africa: application of Landsat ETM+ and ASTER GDEM data in evaluating factors associated with long runout landslides in Benue hills, North-central Nigeria. Landslides DOI 10.1007/s10346-016-0703-9
3. Igwe O (2015) The study of the factors controlling rainfall-induced landslides at a failure-prone catchment area in Enugu, Southeastern Nigeria using remote sensing data. Landslides DOI 10.1007/s10346-015-0627-9
4. Igwe O (2015) Predisposing factors and the mechanisms of rainfall-induced slope movements in Ugwueme South-East Nigeria. Bulletin of Engineering Geology and the Environment DOI 10.1007/s10064-015-0767-0
5. Igwe O, Mode W, Nnebedum O, Okonkwo I, Oha I (2015) The mechanism and characteristics of a complex rock-debris avalanche at the Nigeria-Cameroon border, West Africa. Geomorphology 234: 1-10