

Research Collaboration Marketplace

Applicants from Ghana and Tanzania searching for a Danish Partner, Call for Phase 1 applications 2017, research collaboration projects in Danida priority countries

| Research Theme of Application | |
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| Relevant research theme according to the country of applicant as defined in the Call: (http://dfcentre.com/research/calls-for-applications/) | Theme 1: Growth and Technological Innovation Theme 4: Resilience to Climate Change |
| Applicant Information and Contact Details | |
| Applicant name | Prosper Mafole |
| Applicant qualification (degree) and position | PhD, Lecturer |
| Applicant e-mail address | mafole@udsm.ac.tz |
| Applicant institution and country | University of Dar es Salaam, Tanzania |
| Link to relevant website(s) (institution, CV, other) | www.udsm.ac.tz , www.about.me/mafole |
| Project Proposal Information | |
| Proposed title for the project to be applied for | Developing Innovative ICTs for Improved Agricultural Productivity in Tanzania |
| Brief project description/project idea | Covering 937, 062 square kilometres, Tanzania has a huge potential for agriculture with an estimated 44 million hectares suitable for agricultural production. However, only an average of 10.4 million hectares (24%) are cultivated annually, mostly by small scale farmers under subsistence agriculture. The sector's current contribution to GDP is only 24.1%, though it employs over 75% of national labor force, making it poorly performing. Moreover, an overall agricultural GDP has been growing at a rate of only about 4.4% per annum which is insufficient to lead to significant wealth creation and alleviation of poverty. The challenges that continue to hinder the development agricultural sector include low productivity, over dependence on rain-fed agriculture, inadequacy of agricultural support services, weak agroindustries, low quality of agricultural produce, poor infrastructure, poor participation of the country's private sector in agriculture, environmental degradation, pests and diseases. Existing literature indicate that ICT has a great potential for raising agricultural productivity. To make site specific farming possible, data about soil condition, weather, pests/foreign agents presence have to be collected, drought prediction and disease outbreaks prediction models have to be developed and tested locally. |

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| | <p>The resulting knowledge/information has to be processed and timely delivered to the farmers for preventive and/or corrective measures to be effectively taken. To this end, this research shall investigate how ICT can be used to improve the quantity and quality of agricultural produce without expanding the land already in use.</p> <p>This entails an interdisciplinary research on, development and deployment of, locally appropriate sensors which are effective and can be afforded by the bottom of the pyramid farmers. The team shall investigate the potential of television white space (TVWS) for the reliable transmission of sensor data from the field to the data centre and develop protocols and algorithms to address the shortcomings thereof. To sustainably power the sensors, the researchers shall investigate and develop appropriate, environmental friendly, cost effective and affordable energy harvesting techniques and/or technologies.</p> <p>Expected output include technologies/techniques to monitor the environment and collect agricultural data (nutrients availability and environmental conditions). Data processing and analysis tools, and prediction models, that shall be used to present the collected information to farmers in the form that they can directly apply to increase the quantity and quality of what they produce. A geospatial web-based agricultural information dissemination database that will link farmers, potential investors and production areas.</p> |
| <p>Brief description of the research competencies available on your team</p> | <p>Agricultural crop improvement; value chain management; climate change; agricultural productivity; water resources management; policy analysis (focusing on agriculture-related policies); extension systems; nutrition and food science. Geographical Information Systems & Mapping, Wireless Networking protocols and algorithms analysis, modeling and implementation</p> |
| <p>Describe in max 10 keywords the research competencies you are searching for in a Danish partner</p> | <p>Energy harvesting techniques/technologies, Energy efficient wireless sensor networks, Big Data, Analytics and Data Mining.</p> |