

# Science and Education for Development: Regional Initiative in Science and Education (RISE)

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S&T Capacity: Prerequisite for Sustainable Development

Many initiatives exist:

- strengthening university infrastructure
- supporting research groups
- fostering university-industry collaboration
- promoting south-south and north-south cooperation



- S&T Capacity: Prerequisite for Sustainable Development
  - Largely missing from existing initiatives: mechanisms to prepare faculty to teach in science and engineering departments at Africa's universities.
  - Most universities in sub-Saharan Africa lack capacity to train new generation of professors.
  - Outstanding scientists tend to work in relative isolation.



# A Role for Regional Networks

- Tap existing expertise
- Bring together critical mass of researchers and students in selected areas for research and training





#### State of Higher Education in Africa

- Weakened over several decades by civil unrest, low funding, emigration
- Steep decline in populations of skilled, experienced faculty at even the best universities



#### **Faculty Vacancies**

- Makerere: As of August 2007, 1,052 of 1,796 faculty positions were filled; 666 had PhD's; 554 more needed to fulfill staffing levels.
- UDSM: For first time, teaching positions were being filled in 2007 by staff with only a bachelor's degree – 128 of 512.
- Kenyatta: Of 730 academic staff, only 31 full professors and 48 associate professors.
- University of Nairobi: Because of staff shortages, graduate students in physics are being offered tenure in return for teaching duties.
- Ghana: About 40% of faculty positions in universities and 60% in polytechnics are vacant.
- Nigeria: An estimated two-thirds of the 36,000 faculty positions are vacant.



### Brain Drain

- In 1990, nearly 7,000 Kenyans with tertiary education migrated to US.
- A 2003 estimate: at least 10,000 Nigerian academics and 21,000 Nigerian doctors were in the US alone.
- Movement of academics to wealthier countries within Africa.
- Movement of academics to better-paying jobs in government or private sectors.



# Aging Faculty

- Kenyatta: Of 31 full professors, 28 are over age 50.
- Kyambogo (Uganda): Of 417 academic staff, only 22 have PhDs; 9 of them are past mandatory retirement age.
- UDSM: In May 2006, of 512 academic staff, none were under 30, 8 were between 31 and 35, and only 12% were under 40.
- Prof. R. T. Kivaisi, Dean of Graduate Studies, UDSM: "This trend threatens the continued existence of universities."



# Soaring Demand for Education

- Good news: Demand for education today is soaring.
- Bad news: Universities can't keep up with the demand.
- UDSM: Severe overcrowding, with a doubling of undergrads in 5 years (2002-07), from 7,500 to 14,500.
- UDSM: In same period, number of post-grads increased five-fold from 563 to 2,890.
- → Exacerbates effect of loss of professors, as universities are forced to use less experienced lecturers and tutors.



#### Rationale for Regional Networks of Universities

- Most universities in Africa have limited faculty capacity but where capacity for comprehensive training does not exist in single institutions, it may exist regionally.
- Institutions cannot afford expensive instrumentation but universities could reap economies of scale by sharing equipment.
- Regional networks can create a critical mass of faculty and students.
- Networks can link researchers who are isolated professionally and geographically.
- Models: AERC, AMMSI, US-Africa Materials Institute, USHEPiA.



# Carnegie-IAS African Regional Initiative in Science and Education (RISE)

- RISE will prepare PhD-level scientists and engineers in sub-Saharan Africa through university-based research and training networks in selected areas.
- Medium-term goal: Produce new faculty and upgrade qualifications of existing faculty.
- Long-term goal: Develop capacity of African universities to train and retain succeeding generations of faculty.



# History of RISE

- Role of the Science Initiative Group (SIG)
- The Millennium Science Initiative and the early vision for regional initiatives
- Carnegie Corporation
- Planning workshop, Nairobi, June 2006



# About RISE

- Will support three competitively selected research and training networks, each comprising universities in at least three different countries in sub-Saharan Africa.
- Each RISE network will grant at least 15 PhD and Masters degrees over 4-6 years.
- Each network will receive funding of approximately US\$800,000 over 2 ½ years; follow-up funding likely.
- Retention strategy critical.



#### **Priority Areas**

- Materials science
- Mathematics
- Chemistry, including natural products and biochemistry
- Information and communication technology, instrumentation, software engineering
- Renewable energy
- Water resources



#### **Selection Criteria**

- Scientific merit
- Training capacity
- Research activities
- Evidence of institutional support
- Added value of the network versus separate support to individual institutions
- Potential for sustainability
- Strategy to attract/retain female faculty and students
- Strategy to retain RISE graduates at universities in the region



#### Timetable

- December 2007 Request for Concept Proposals issued
- March 7, 2008 Deadline for concept proposals
- April 2008 Notification of finalists
- June 2008 Deadline for full proposals
- July 2008 Selection of RISE networks
- September 2008-January 2009 Networks commence work



#### Partnerships

- World Bank
- African governments
- Partnership for Higher Education in Africa
- TWAS
- International Foundation for Science
- U.S. universities



#### Challenges

- Regional initiatives will require new funding modalities by the World Bank, regional development banks and bilateral development partners.
- Buy-in and financial support of individual governments of all the countries participating in regional networks will be essential.



# **Closing Remarks**

- Networks meant not to replace, but to build on and complement other capacity-building initiatives.
- RISE won't succeed in isolation; needs your input and involvement.

For more information: www.msi-sig.org/rise.html