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

Phillip A. Griffiths
Science Initiative Group
Institute for Advanced Study
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.

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