Science and Technology in the Developing World: The Institute’s Role

PHILLIP A. GRIFFITHS
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www.ias.edu/sig
The Vital Role of Technical Knowledge in Economic Development

• After World War II, development focused on capital and construction.

• In the late 1950s a few economists began to appreciate the essential role of “knowledge” in promoting economic growth.

• Robert Solow: A “residual” pattern of economic growth stems from technological advances and far outweighs contributions of capital or labor.

• Until the current decade, only a few large donors realized need to develop human resources at the university level.
More Organizations Now Promoting S&T for Development

• World Bank: new structure for S&T in development

• African Development Bank: a new unit focuses on higher education and S&T

• SIDA/SAREC, Sweden

• International Development Research Centre, Canada

• The Netherlands, Denmark, Norway, Germany

• Department for International Development, UK
Models of Development (1)

• Old model: Consultancies by outside experts

• New model: Strength developed within each country
  • Identify local scientific and academic leaders
  • Help them identify local opportunities and train people to address them
  • Help create partnerships so these leaders can adapt innovations developed elsewhere
  • Link academia with public and private actors who can use new knowledge and tools
  • Articulate the values of objective experimentation and evidence-based results – the culture and power of science
Models of Development (2)

• Link those who teach with those who use knowledge

• Help academics understand their role
  – University mission: teaching, research and service

• Help industry understand the value of research
It all started with James D. Wolfensohn:
Chairman, IAS Board of Trustees, 1986-2007
President, The World Bank, 1995-2005

and

Claudio (Teitelboim) Bunster:
Member, IAS, 1978-80 & 1989
Science Advisor to
President Eduardo Frei, Chile, 1994-2000
Funding

Carnegie Corporation of New York

the David & Lucile Packard Foundation

The Andrew W. Mellon Foundation

The World Bank

National Academy of Sciences

The National Academies

United Nations Development Programme
SIG Board established June 1999. Current Membership:

- Phillip Griffiths*, Institute for Advanced Study, USA (chair)
- Mohamed Hassan, TWAS & African Academy of Sciences, Trieste, Italy
- J. Tomas Hexner*, Development Consultant, USA
- Chung W. Kim*, Korea Institute for Advanced Study
- Jacob Palis*, Instituto Nacional de Matemática Pura e Aplicada (IMPA), Rio de Janeiro, Brazil
- CNR Rao*, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India
- Harold Varmus, Memorial Sloan Kettering Cancer Center, USA

Staff:
- Arlen Hastings*
- Alan Anderson
- Kiera Carlisle
- Lori Piranian

*Founding Members
Origins of the MSI: Chile 1998

www.mideplan.cl/milenio
MSI Expansion

- Followed by an MSI in Brazil; another IAS connection.

- Chile and Brazil were joined by Mexico. The first two continue to serve as models for other projects implemented or planned in Uganda, Kazakhstan, Rwanda, Vietnam.
Opportunities and Challenges

The MSI in Africa
African Mathematics Millennium Science Initiative

- A network of mathematics research, training and promotion throughout sub-Saharan Africa
- Fellowships, scholarships, conferences

AMMSI Regional Coordinators:

Wandera Ogana  
U of Nairobi,  
Kenya  
(East Africa)  
*Program Coordinator*

Bitjong Ndombol  
U of Yaoundé,  
Cameroon  
(Central Africa)

Edward Lungu  
U of Botswana  
(Southern Africa)

Samuel Ilori  
U of Ibadan,  
Nigeria  
(Western Africa – Anglophone)

Hamidou Toure  
U of Ouagadougou,  
Burkina Faso  
(Western Africa – Francophone)
Uganda MSI

www.uncst.go.ug

Y. Museveni
RISE (1)

- Vartan Gregorian’s invitation to initiate a program for higher education in Africa.

- Preparation pointed to need for dual, linked objectives: to prepare scientists to teach in universities and to do this in context of competitive research activities.
RISE (2)

Carnegie planning grant to SIG/IAS, April 2007

Planning workshop, Nairobi, June 2007

Consultations, July-November 2007: Botswana, Ethiopia, Kenya, Nigeria, Rwanda, Senegal, Tanzania, Uganda; also AAS, AAU, IFS, NAS, PHEA, TWAS, World Bank, U.S. university partners

G. Ogunmola
Nigeria

W. Ogana/ P. Masila
Kenya

J. Olang/ T. Egwang
Kenya/Uganda

B. Abegaz
Botswana/Ethiopia

A. Johnson
Carnegie Corp

A. Johnson
Carnegie Corp

S. Lwakabamba
Rwanda

T. Givens
UT-Austin

W. Soboyejo
Princeton U

Senegal/Kenya/UK/Netherlands
RISE (3)

9/07 – Initial grant from Carnegie Corporation for three networks

12/07 - Request for Concept Proposals

1/08 - Selection Committee appointed:

- Lishan Adam
  Ethiopia

- John Ball
  UK

- Anthony Cheetham
  UK/US

- Cheryl de la Rey
  South Africa

- Nighisty Ghezae
  Eritrea/Sweden

- Narciso Matos
  Mozambique

3/08 - Concept Proposal deadline
48 concept proposals involving 29 countries

12 finalists involving 14 countries
RISE (4)

- 7/08 - Partnership with African Academy of Sciences
- 7/08 - Three networks announced
- 9/08 - $1.6 million grant from Carnegie for two additional networks
- 10/08 - Inaugural meeting of RISE network representatives, Nairobi
RISE Networks

AMSEN ★
(SA, Botswana, Kenya, Namibia, Nigeria)

RISE-AFNNET ➪
(Uganda, Kenya, Tanzania)

SABINA ☀
(Malawi, Namibia, Tanzania, SA)

SSAWRN ★
(SA, Botswana, Mozambique, Uganda)

WIO-RISE ✿
(Tanzania, Mozambique, SA)
Increased skills in materials science and engineering are needed in southern Africa to develop and add value to the region’s extensive mineral deposits. AMSEN will benefit from existing collaborations, including the DST/NRF Centre of Excellence in Strong Materials and the Wits-Namibia Engineering Curriculum Development Program in nanotechnology. To reduce the brain drain from academia to industry, AMSEN plans a retention strategy that includes allowing staff to consult for and be seconded to industry.
RISE-AFNNET: African Natural Products Network

Makerere University, Uganda
University of Nairobi, Kenya
Sokoine University, Tanzania

RISE-AFNNET seeks to develop Africa’s rich biodiversity into a natural products industry of social and economic significance. RISE-AFNNET will expand existing research programs and formalize educational activities in such natural products fields as engineering, biochemistry, environmental science, pharmacology, economic development, and nutrition. Students will be recruited to identify and work on natural products research projects in the context of poverty alleviation, gender equity, and Millennium Development Goals.
Why Networks?

- Mitigate professional and geographic isolation
- Mentoring for graduate students
- Research partners for faculty
- Share instrumentation and other resources
- Links with international partners
  
- Carnegie sponsoring humanities program parallel to RISE: ACLS initiative for humanities faculty in Africa
Moving Toward the Network Model

- *Strategic Approaches to Science and Technology*, World Bank
- *Inventing a Better Future*, InterAcademy Council
- *Eliminating World Poverty: Making Governance Work for the Poor*, UK White Paper
What Does RISE Need to Succeed?

- Metrics to assess progress in capacity building
- Government support
- Stronger links to private sector
- Transfer to local leadership