Globalization of Science for the Benefit of All

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Why globalize science?

- Globalization of science benefits everyone; science-based issues are global:
  - Environment
  - Energy
  - Climate change
  - Food security
  - Economic prosperity

Benefits of STI as an engine of economic growth

- Improves skills, productivity, wages; adds value to exports
- Raises chances of peace and political stability, which are functions of economic development

Globalizing science…

- …means raising the capacity to generate and use STI in many ways, which requires human resources
- How to do this in ways that benefit people, institutions, countries, regions?
- How to sustain and extend STI strengths into society?

The example of Africa

- Even the smallest African countries agree that some level of STI is needed for economic development
- Where are the people with the expertise to carry this out?

Disadvantages of the traditional model

- Send aid in the form of resources, professionals, and infrastructure from the outside
  - Agenda determined elsewhere, often with limited understanding of local context; programs may not be sustained; no capacity building
- Move students from Africa to other countries for advanced training
  - Risk of brain drain; research may not be locally relevant; programs may be expensive and therefore difficult to scale up

Need for a new model

- Countries need expertise in the form of people who live and work in their home countries – not expertise that may be removed when an aid program ends
- Strengthening STI capacity is best done in situ
  - Local students gain intimate knowledge of local problems and opportunities
  - Once trained, they assume the responsibilities of sustaining research activities and passing their expertise to the next generation of STI leaders
  - They can better reach those who make policy and carry expertise into society

One approach to a new, more symmetric model

- Not based on the one-way flow of knowledge from the “developed” to the “developing”
- Views aid in the context of a partnership, with the objective of producing benefits for both partners and for the world community

A new way of viewing STI knowledge

- “Advanced” knowledge is complemented by the knowledge of the developing-country partner: knowledge of what’s practical, acceptable, valuable, and possible on the ground
- The two forms of knowledge are complementary or “symmetric”

A new model requires stronger STI capacity in developing countries

- How can outside organizations help increase this capacity?
  - Begin by turning to local leadership in symmetric partnerships
  - Understand how African universities are already trying to identify needs and increase capacity themselves
  - Consult locally on how outside institutions can help

Partnership for Higher Education in Africa (PHEA)

- Partnerships with vice chancellors and other academic leaders have led to intimate knowledge of African universities

www.foundation-partnership.org

Regional Initiative in Science and Education (RISE)

- SIG and Carnegie Corporation partner with universities on regional networks: local selection of topics, leaders, graduate students, program structure

www.ias.edu/rise

Global Science Corps (GSC)

- Plan to send GSC Fellows abroad for collaborative research and teaching
  - Benefits do not flow just one way (from “us” to “them”); learning is a two-way street
  - May include a specialized science corps within the Fulbright program?

www.ias.edu/gsc

Development institutions

- Along with universities and foundations, bilaterals and multilaterals need to join such partnerships
- World Bank discussing a plan to move STI closer to the center of its poverty alleviation mission
- In the past, World Bank criticized for overlooking local knowledge; today it is eager to work in partnerships

The central issue for participating institutions

- Universities' missions remain teaching, research, and service
- University presidents and VCs understand that each component requires people of many skills
- Human resources
  - Research scientists and faculty
  - People who absorb, disseminate, and use technical knowledge
- STI training should not stop at university doors
  - Need to reach into private and public sectors
  - Countries can realize full value of STI for development only when people understand value of science and make use of its tools

A few successes

- Millennium Science Initiative (MSI) in Chile, Brazil, Uganda
  - Bringing STI into economic development, with government support
  - Strengthens human resources
  - Slows brain drain
  - Raises STI capacity
  - Converting MSIs into economic growth is a work in progress

A few more successes in Africa

- Sandwich programs originated by Sweden: well focused, reduce brain drain
- Uganda and Rwanda: political support from the top
- International Institute for Water & Environmental Engineering (2iE), Burkina Faso: diverse support from local government, scientific community, diaspora; managerial autonomy

Things needing improvement

- Cross-border collaborations
- Links between academics and entrepreneurs
- Training, retraining, and retention of academics
- Research management capacity
- Support for local agendas

Frustrations

- Many meetings, reports, recommendations, and policies; relatively little action or implementation
- STI issues are usually cross-sectoral, needing support from ministries of finance, planning, and others, but as such may become 'administrative orphans' without a strong champion
- Many programs initiated but not sustained

Some lessons

- Universities in developing countries have interesting science not typically seen at major research universities in OECD countries
- African universities are eager to participate in the globalization of science, but they want to originate and design programs in Africa
- Universities want outside partners, as long as knowledge flows both ways and all partners share in design, management, and benefits