InterAcademies Panel (IAP)
Statement on Digital Knowledge Resources and Infrastructure in Central America and the Caribbean

Internet2 Fall Member Meeting
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by
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The IAP is a global network of 98 science academies, formed in 1993, under the lead of the U.S. National Academies of Sciences (NAS) designed to help its members develop the tools that they need to participate in science policy discussions and provide input to policy makers at the national and international levels.

Many IAP members are in developing countries.

The IAP forges partnerships among its members and works closely with other scientific organizations, including the International Council for Science (ICSU), InterAcademy Council (IAC), and InterAcademy Medical Panel (IAMP).

The IAP also cooperates with regional academy networks in Asia (AASA, FASAS), Latin America (IANAS), Caribbean (CSU), Africa (NASAC), Islamic Countries (NASIC), Europe (ALLEA), and Developing Countries (TWAS).
InterAcademies Panel (IAP) Program on Access to Scientific Information

- IAP was very much interested in promoting better access to digital scientific information resources for scientists who work in less developed countries and launched the following initiatives:
  - 2004–2007 IAP Initiative on Access to Scientific Information in Developing Countries
  - 2008–2010 IAP Program on Promoting Access to and Use of Digital Knowledge Resources and Infrastructure: Focus on Countries with Developing and Transitional Economies, (referred to as the “IAP Program” below).

- The IAP Program is directed by the US NAS in partnership with the Chinese Academy of Sciences, the Indian National Science Academy (INSA), the Academy of Science of South Africa (ASSAF), the Brazilian Academy of Sciences (BAS), the Academy of Sciences of Cuba (ACC), other interested Academies, and other organizations that already have been engaged in these same issues.

- The IAP Program was to perform the following tasks:
  - To convene a series of international workshops and meetings on a regional basis to focus on the issues, identify tangible projects, and develop work plans.
  - To work with other IAP programs as well as other organizations already engaged on these issues to avoid duplication of effort and to leverage existing expertise and resources.

- The regional workshops and meetings determined that there was a need to
  - Focus on the development of regional/country knowledge resources and repositories;
  - Also focus on the need to develop regional and country infrastructure

- Two Task Groups were formed under the Steering Committee:
  - Task Group on Knowledge Resources in Developing Countries
  - Task Group on Knowledge Infrastructure in Developing Countries
IAP Program on Digital Knowledge Resources and Infrastructure in Developing Countries

Leadership

Program Chair
Michael Clegg, Foreign Secretary, National Academies of Sciences, USA

Program Director
Paul Uhlir, Director, Board on Research Data and Information, NAS, USA
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Co-Chairs, Task Group on Knowledge Resources
Bill Anderson, Adjunct Professor, School of Information, University of Texas at Austin
Susan Veldsman, Director, Scholarly Publishing Unit, Academy of Science of South Africa (ASSAf), South Africa

Co-Chairs, Task Group on Knowledge Infrastructure
Don Riley, Professor, University of Maryland and IEEAF Chair
Xiao Yun, Director of Computer Network Information Center, Chinese Academy of Sciences
IAP Program on Digital Knowledge Resources and Infrastructure in Developing Countries

Meetings:
May 2008: Organizing meeting of Steering Committee, CAS, Shanghai, China.
May 2009: Second meeting of Steering Committee and first meeting of two Task Groups, ASSAf, Pretoria.
May 2010: Regional Workshop for Central America/Caribbean, and third meeting of Steering Committee, CAS & ACC, Montego Bay, Jamaica.

Reports:
An Inventory of Resources for Creating Open Institutional Repositories (2008).
Reports of each meeting are available on IAP website;
http://www.interacademies.net/CMS/Programmes/4704.aspx

Projects:
Supporting projects in Central America and Caribbean.
IAP Website

Lead Academy: The US National Academy of Sciences (NAS)

IAP will promote programmes that expand electronic access to scientific information, especially for scientists working in least developed countries (LDCs). Contacts: PUhlir@nas.edu, jboright@nas.edu

The primary goal of this programme is to engage IAP and its Members in strengthening their own scientific and technical (S&T) capacity as well as in developing countries and transitional economies by enhancing access to and use of digital knowledge and the related infrastructure. More specifically, it will promote the goal established in IAP's Strategic Plan to enhance the quantity and quality of information on issues of science and society that is being exchanged among member academies, thereby building the policy advisory capacity of individual academies. The programme also will build directly upon the activities and results of the 2004-2007 Initiative on Access to Scientific Information in Developing Countries. The two major areas of focus are:

- access to and use of digital S&T data and information, and access to and use of digital networks and infrastructure for research and education.

The opportunities as well as the challenges involved require sustained attention from IAP and its members, in collaboration with other organizations working in these domains, at international, regional, and national levels.

Recent Reports issued:

- **NEW in 2010**: The summary of the 3rd Meeting of the Steering Committee of the Programme on "Digital Knowledge Resources and Infrastructure in Developing Countries" is now available as a pdf file [HERE](#).

  The meeting was held at Montego Bay, Jamaica, and was organized by the Caribbean Academy of Sciences, from 14-15 May 2010.

  **Steering Committee: May 2009** The report of the second meeting of the Steering Committee for this IAP programme is available for download [HERE](#). The meeting took place in Pretoria, South Africa, on 11-12 May 2009, and was hosted by the Academy of Science of South Africa (ASSAf).

- Executive Summary of the results of a survey conducted among IAP Members (March 2009)
- Full report and feedback from IAP Members (March 2009)
Outcome from Steering Committee Meeting in Pretoria, South Africa

Focused on Sub-Saharan Africa, but also included Caribbean and Central America

Finalized work plans and priorities for the two task groups

Task Group on Digital Knowledge Infrastructure
1. Create a policy advisory council, in each region, that can help reduce barriers at national levels - to provide policy advice in the regions to promote better understanding regarding the establishment, management, and applications of high-speed research and education networks (RENs)
2. Draft a white paper to summarize and promote the policy objectives.
3. Draft a policy statement for formal adoption by the IAP and/or Academies local to the regions.
Outcome from Steering Committee Meeting in Pretoria, South Africa

Task Group on Digital Knowledge Resources

1. Digitization of analogue resources

2. Open institutional repositories

3. Open knowledge environments (OKEs)

4. Advisory council on open knowledge resources in developing countries – to address the importance of open access in the context of science and development, as well as provide policy makers with the information about such mechanisms

5. Data integration demonstration projects:
IAP Program on Digital Knowledge Resources and Infrastructure in Developing Countries

- **Open Institutional Repositories:**
  Establish two or more open institutional repositories for information produced or contributed by Science Academies in developing countries, and promote the establishment of open repositories at universities and other research centers.

- **Scientific Data Centers and Networks:**
  Promote the strengthening of existing scientific data centers or networks and the formation of new ones, and initiate two or more scientific data integration pilot projects focused on research and applications in high-priority areas, such as poverty reduction, food security, environmental sustainability, or health.
**Open Knowledge Environments:** Develop at least two interactive, online open knowledge environments. An Open Knowledge Environment (OKE) is a web-based portal, focused on a well-defined, thematic topic, that supports discovery of, access to, and interaction with research, education, and government information and knowledge resources.

**Promote Open Access Policies and High-speed Research and Education Networks:** Encourage participating Science Academies and selected external experts to promote better understanding of and action on
(a) the development of appropriate criteria and incentives regarding open access to publicly-funded and non-commercial knowledge resources, and
(b) the establishment, management, and use of high-speed research and education networks.
Montego Bay Meeting of the Steering Committee – focused on Central American and Caribbean Region

The Steering Committee meeting was preceded by a two-day technical training workshop on Open Access and Dissemination of Scientific Information.

The primary objectives of the Steering Committee meeting were to:

1. Review the program work to date;
2. Review and finalize the draft policy statements – one for Africa and one for Central America and the Caribbean;
3. Specify the next steps of the program, and
4. Transfer leadership of the program to the Central American and Caribbean region and create an advisory committee.
Steering Committee Action Item Summary

Items agreed to at the meeting:

1. Finalized Cyber-infrastructure Statements
   a. Disseminate the Steering Committee CyberInfrastructure Statement in the two regions (Africa and Central America and the Caribbean).
   b. Use the dissemination plan constructed at the SC meeting.
   c. Establish a process to keep track of dissemination activities.

2. Open Access (OA) Position Paper
   a. Develop and disseminate an OA position paper, similar to the cyberinfrastructure statement.
   b. Establish a regional Open Access Frequently Asked Questions (FAQ) document modeled on an existing European Commission example.
   c. Establish national and regional groups and meet once to plan actions for implementing OA policy and practices.

3. Open Institutional Repositories (OIRs):
   document the current OIR implementations in Cuba and the potential collaborations with Guatemala.

4. Electronic Theses and Dissertations (ETDs):
   follow up with the University of the West Indies on deployment of ETD templates and practices.
Steering Committee Action Item Summary

items agreed to at the meeting (cont’d)

5. Open Knowledge Environments:
   The objective is to deploy a prototype OKE system in the region.
   a. Select (regional) candidate journals that either use, or can adopt, the Open Journal System (OJS).
   b. For each journal selected determine interest in OKE features and capacity for support.
   c. Write a proposal for developing OJS-based implementation of the key features.
   d. Secure funding and implement.

6. IAP Project Steering Committee administration
   a. Establish an online, persistent collection for the IAP Program resources.
   b. Review the project’s PBWorks wiki setup.

7. Advisory Group: Work with regional groups to facilitate transfer of leadership from Steering Committee to the region.
   a. Alejandro Caballero Rivero (ACC) agreed to provide initial leadership.
   b. Should consider forming broader group that would meet 1 or 2 times per year that would include:
      • Academic/educational representative from each country
      • “Networking/infrastructure” representative from each country
      • Representatives from C@ribNET, CLARA, FIU AMPATH/AMLIGHT
   c. Plan a regional workshop in the next year.
Montego Bay
Group Picture
Building the CyberInfrastructure for 21st Century e-Science in Central America and the Caribbean

Statement of the Steering Committee of the InterAcademies Panel Program on Digital Knowledge Resources and Infrastructure in Developing Countries

In recent decades, CyberInfrastructure — also called e-Science infrastructure — has transformed the very nature of how science is practiced, taught, studied, and applied, particularly in more economically developed countries and institutions. Technological advances have improved capabilities for data collection, storage, and analysis for potentially universal access to the research literature and the underlying data, and for e-learning and distance education. Dedicated, advanced networks for research and education are now the international norm in the more economically developed countries, enabling sharing of data from massively large repositories, scientific instrumentation (e.g., accelerators, telescopes, satellites), and computational resources, as well as new forms of collaboration that require access to such advanced Internet-based capabilities and shared resources.

Increasing the availability of CyberInfrastructure tools and technologies and thereby improving access to these growing public knowledge resources by researchers and educators in developed and developing countries has the potential to pay huge dividends. These technologies hold the promise to greatly enhance the ability of scientists in the developing world to both benefit from and contribute to the rapidly growing body of scientific knowledge. Such infrastructure improvements enable individuals, groups, and institutions to address the major problems in their countries and beyond, through relevant knowledge production and dissemination, technology development, and the capacity to innovate. Moreover, the potential benefits are not limited to the scientific and academic communities. Among the anticipated effects of creating a robust CyberInfrastructure is the transfer of knowledge and skills to other sectors, resulting in improved economic and social development.

Although much progress has been made, the CyberInfrastructure in
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Statement – The Value Proposition

Increasing the availability of CyberInfrastructure tools and technologies and thereby improving access to these growing public knowledge resources by researchers and educators in developed and developing countries has the potential to pay huge dividends. These technologies hold the promise to greatly enhance the ability of scientists in the developing world to both benefit from and contribute to the rapidly growing body of scientific knowledge. Such infrastructure improvements enable individuals, groups, and institutions to address the major problems in their countries and beyond, through relevant knowledge production and dissemination, technology development, and the capacity to innovate. Moreover, the potential benefits are not limited to the scientific and academic communities. Among the anticipated effects of creating a robust CyberInfrastructure is the transfer of knowledge and skills to other sectors, resulting in improved economic and social development.
Although much progress has been made, the CyberInfrastructure in the developing world still lags significantly behind that of the industrialized world. The network bandwidth available to most research institutes and universities is far from adequate, often less than that available for even single home computers in developed countries. This deficiency of bandwidth causes significant network congestion and seriously degraded quality of transmission and throughput. According to the International Telecommunications Union’s 2009 ICT Development Index, the average price per unit capacity of fixed broadband Internet access in the region comprising Central America and the Caribbean is about 10 to 50 times higher than the average price in Europe and North America (as a percentage of GNI per capita). Factors of 30 times higher are common and the price disparity ranges as high as 1,857 times the average in Europe and North America.
Statement - Challenges

The current state of CyberInfrastructure in the region presents many difficult challenges, but these can be overcome if the right policies and practices are put in place.

Among the measures required to address these challenges include the need to:

• **Promote greater awareness** at the highest levels of government and policymakers on the importance of high speed regional and national Research and Education Networks (RENs) for regional development;

• **Develop and implement clear policies, regulations, and plans** that enable and encourage the development of national RENs and regional, cross-border connectivity between them;

• **Recognize the disparities** in infrastructure and market environment throughout the region; and

• **Emphasize the development** of the relevant underlying human capacities and skills.
Recommendations

1. **Governments** in the region examine their laws, regulations, and policies concerning the information and telecommunications infrastructure and services, and modify them as necessary to:

   a. Take all the necessary steps to **ensure the development and appropriate funding of strong Research and Education Networks (RENS)** that develop and operate high-speed networks and permit them to own or operate their own fiber-optic or other broadband infrastructure, and to maintain their own international gateways to the global REN community and the Internet.

   b. **Remove barriers to competition** that limit the supply of bandwidth and keep its cost artificially high.

   c. **Actively promote the building of, and connection to, fiber-optic links and other appropriate broadband technologies**, or partner with other nations in the region to share available bandwidth on existing broadband technologies.

   d. **Promote and encourage the participation by governments and non-governmental organizations in regional and international alliances** that are working to provide shared access to existing and future CyberInfrastructure, and to facilitate the sharing of the human capital and expertise necessary to create, maintain, and expand such infrastructure, including data centers and digital repositories on an open basis.
2. At the same time, educational and research organizations, as well as non-governmental and private sector organizations, need to:

a. Create opportunities for cooperative and collaborative agreements with similar organizations within their regions for sharing the technical and human resources necessary to develop and improve the technical infrastructure essential for the conduct of science in the 21st century.

b. Work actively to develop NRENs within countries, regional REN interconnectivity, and robust international connectivity into the global REN community.

c. Work actively to break down barriers to sharing publicly generated or funded scientific data and information across institutions, disciplines, and national boundaries to make full and efficient uses of the new REN capabilities.

d. Consider development of, and participation in, regional repositories and data centers on an open online basis, particularly where it may be more efficient and effective to share such information for common use.
Signatories

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Value of the Statement

- I have read the document and it looks good from my knowledge. They form a synthesis of good practice from a highly respected body and use may be made of them by National Academies, Science Councils, etc., in briefing their National Press, Governments etc. When it is released it will be a useful document with, for example, our new Science Council in Malawi.

  Margaret Ngwira, MAREN, Malawi

- The IAP Declaration of Montego Bay is useful to me because it gives impetus to the demand side work I'm doing for C@ribNET. We might have a physical network early next year but without researchers and data open to other researchers, then the value of the network is not living up to expectations. OKEs and OIRs are absolutely critical to the value proposition of C@ribNET because I KNOW there is lots of data in our institutions, most of it left unanalyzed for years. I want that to change.

  Carleton Samuels, C@ribNet & CKLN
Notes from the Montego Bay meeting and downloadable copy of the statement

- Caribbean Academy of Sciences site
  
  http://sites.google.com/a/caswi.org/caswi/Home/iap_meeting

- Statement can be downloaded:
  
  http://sites.google.com/a/caswi.org/caswi/Home/iap_meeting/IAP_Statement_on_CI_LA%26C_Finalw-sigs.pdf?attredirects=0&d=1
IAP Program on Digital Knowledge Resources and Infrastructure in Developing Countries
Regional Technical Training Meeting
Montego Bay, Jamaica, 12 - 14 May 2010

Open Access and Dissemination of Scientific Information in Central America and the Caribbean

Third Meeting of the Steering Committee
Montego Bay, Jamaica, 14 - 15 May 2010

Agendas are given below.

The final version of the Statement arising from the Meeting on "Building the CyberInfrastructure for 21st Century e-Science in Central America and the Caribbean" and the version for Africa are available below. These have the signatures of those attending and participating in the IAP meetings.