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InterAcademy Panel on International Issues Program on Digital Knowledge Resources and Infrastructure in Developing Countries

Report of the IAP Coordinating Meeting for Central America and the Caribbean Region

Havana, Cuba
5 September 2008

Prepared by
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Paul F. Uhlir, National Academy of Sciences (NAS)

Summary of Agreed Actions

The following projects and actions were agreed to by the participants (see Appendix A) at the InterAcademy Panel on International Issues (IAP) Program on Digital Knowledge Resources and Infrastructure in Developing Countries for Central America and the Caribbean. They are divided according to the topics of the two Task Groups of the IAP Program, the Task Group on Promoting Digital Networks and Infrastructure for Research and Education in Developing Countries, and the Task Group on Promoting Access to and Use of Digital Knowledge Resources in Developing Countries.

A. Projects and Activities on Promoting Digital Networks and Infrastructure for Research and Education in Developing Countries

Action A1: Latin American Collaboration of Advanced Networks (Red CLARA).

What: The Central American and Caribbean Academies/S&T Associations at this IAP meeting will develop or enhance research and education coordination and advisory groups in their respective countries to work with the Red CLARA community at the national and regional levels, and to promote open access (OA) mechanisms and applications.

Why: It is important to improve the support, policy, and utilization of Red CLARA by the research and education communities in each country and at a regional level, with particular focus on OA mechanisms and applications, such as open national repositories

and open institutional repositories (OIRs) and OA journals through SciELO. The many justifications for this type of activity were well-explained at the Havana workshop, and can be referenced. The Academies and S&T Associations in each country have an appropriate leadership role to play in this context. The IAP Program is also appropriate to help organize and stimulate such a function, because it is fully consistent with both of the central tasks of the IAP Program, and research capacity building is an overarching goal of the IAP.

How: Each Academy/S&T Association national representative at this meeting will contact the existing Red CLARA group in their country to become informed about the status of that group and the status of coordination with the research and education communities.

Once the baseline information is gathered, the Red CLARA group will be formed or augmented to include the relevant institutions and OA experts or supporters at the national level. This group will develop a plan for implementing and using Red CLARA effectively within the national research and education sectors. The group also should advocate and disseminate the related policies and activities. It will work with the IAP Program and other relevant regional and international organizations to advance these objectives.

Each national group will select one representative to participate in a regional IAP Working Group that will exchange information and coordinate on activities as appropriate. This Working Group will meet at least once per year, preferably in conjunction with another thematically linked meeting.

Where: The initial activity will involve those countries represented at the September 5 IAP meeting in Havana, but will add other countries according to their interest. IANAS will be asked to help in this regard. The annual regional meetings will be held in different locations, depending on the opportunities for co-location with other related meetings.

Who: The participants at this meeting and others as appropriate, to be determined. The Cuban Academy of Sciences will represent the regional Working Group on the IAP Steering Committee.

When: The first phase of this project, the discussions at the national level, the collection of the background information and an initial draft report, and the formation of the working group, if possible, will be completed by March 2009. Annual meetings will be held based on the co-location with other regional meetings.

Action A2: Development of a recommendation guide.

To create a recommendation guide on how to link Red CLARA in order for the countries that have not yet joined this network to know how to proceed.

Action A3: Funding of new activities.

This can be done at the national, regional, and international levels, and through Alice 2 Project, specifically for Nicaragua and Cuba. The Dominican Republic and other countries are not included in the Alice 2 Project, so it is necessary to identify other funding sources.

B. Projects and Activities on Promoting Access to and Use of Digital Knowledge Resources in Developing Countries

Action B1: Open Institutional Repositories infrastructure network.

What: The Central American and Caribbean Academies/S&T Associations at this IAP meeting will develop or enhance research and education coordination and advisory groups in their respective countries to create an Open Institutional Repository infrastructure network in this region.

Why: Open Institutional Repositories (OIRs) are a fundamental component of the research infrastructure in many countries. They increase visibility and research impact through global sharing of data, prevents duplicative work, promote partnerships and collaborative projects, accelerate scientific progress by making information resources easily available, and there are many other benefits that were very well addressed at the meeting. Perhaps most important from the perspective of developing countries, however, is that the establishment of open institutional repositories can counter the current problem of their relative invisibility on the internet at the national, regional and international level. So, it is important for the Academies and S&T Associations of this region to support and to improve the use of OIRs by the scientific and educational communities in each country and at a regional level. The IAP Program is fully consistent with the development of OIRs, so it can help organize and stimulate this action.

How: The Brazilian Institute for Science and Technology Information (IBICT) has developed a model for scholarly information based on open archives initiative standards and has OSS standards for OIRs, using D-Space and E-Prints software. It is possible to create an OIR infrastructure network in this region and to use the IBICT platform to

develop the OIRs and tools, which could then be integrated with OIRs in other regions.

SciELO is a successful experience for the Latin American region and it could be used as an example. Adding a SciELO repository in each country could be useful as well to promote the establishment of quality OA scientific journals. The planned Open Access Scholarly Information Sourcebook (OASIS) can also be useful in this effort.

Each Academy/S&T Association national representative at this meeting will determine the status of OIRs and OA journals in each country, and determine the existing policy of the science and education ministries with regard to these OA mechanisms.

Once the baseline information is gathered, National Groups will be formed or augmented to include the relevant institutions and OA experts or supporters. These groups will develop a plan for implementing and using OIRs effectively within the national research and education sectors. These groups also should advocate and disseminate the related policies and activities, and will work with the IAP Program and other relevant regional and international organizations to advance these objectives.

Each National Group will select one representative to participate in a regional IAP Working Group that will exchange information and coordinate on activities as appropriate. This Working Group will meet at least once per year, preferably in conjunction with another thematically linked meeting.

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Action B2: Technical Training Meeting for Central America and the Caribbean Region.

A meeting of technical and OA experts will be convened at the regional level after the initial fact-finding survey to explore in greater depth the requirements and ways to implement the OIRs. The organizations details of such a meeting (host, date, etc.) will be discussed further, depending on the opportunities for co-location with other related meetings.

Action B3: Funding of new activities.

The establishing of OIRs in each country needs to be funded. This can be done at the national, regional, and international levels, and in collaboration with the existing OIR programs and funding programs.

eIFL.net may be able to help if the new EC OVERDRIVER project is approved as this includes international cooperation also with Latin America. eIFL.net is also ready to help by transferring knowledge on the establishment of OIRs in Europe gained in the Europe wide DRIVER I and DRIVER II projects. This organization can also work with the IAP Program on Digital Knowledge Resources and Infrastructure to respond to the European Commission (EC) calls for proposals as a partner. Other funding sources need to be identified and solicited.

Meeting Report
September 5

Session 1. Meeting background and overview of the IAP Program on Digital Knowledge Resources and Infrastructure in developing countries

Chair: Dr. Ismael J. Clark Arxer, President, Academy of Sciences of Cuba (ACC), (Cuba).

Dr. Ismael J. Clark Arxer (ACC) welcomed the participants of the meeting and briefly introduced Prof. Michael Clegg (US NAS), Paul F. Uhlir, J.D. (US NAS), Prof. Sergio Jorge Pastrana (ACC) and MSc Alejandro Caballero Rivero (ACC), who were sitting at the chair table. Dr. Clark also reviewed the format for the session and explained its main theme.

Prof. Sergio Jorge Pastrana (ACC) stated that it was an honor for the Academy of

Sciences of Cuba to serve as the host for this IAP Program Coordinating Meeting for Central America and the Caribbean region. He also told the participants that the Cuban Academy considered it was very important to develop such a meeting and he was very happy that representatives from different academies and scientific organizations had come to Havana to take part in it.

Prof. Michael T. Clegg (US NAS) expressed the view that IAP was very much interested in promoting a better access to digital scientific information resources for scientists who work in less developed countries and in this way, during 2004 – 2007, it developed the IAP *Initiative on Access to Scientific Information in Developing Countries* gave an overview of the IAP Program, and taking into account the results of this initiative, IAP was now developing the InterAcademy Panel on International issues (IAP) *Program on Promoting Access to and Use of Digital Knowledge Resources and Infrastructure*: *Focus on Countries with Developing and Transitional Economies,* 2008 – 2010 (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.

Consistent with this background, the goals for this meeting were:
1) to present and discuss specific projects for promoting access to and use of Research and Education Networks (RENs) in Central America and the Caribbean;
2) to present and discuss specific projects for promoting access to and use of Open Institutional Repositories in Central America and the Caribbean;
3) to identify actionable results;
4) to identify the organizations that will be in charge of this work; and
5) to define the guidelines for the work among the different Academy/S&T Associations of this region and the two main Task Groups of the IAP Program.

Mr. Paul F. Uhlir (US NAS) made a presentation in which he reviewed the previous activities and results of the 2004 – 2007 IAP initiative and the current IAP Program. He began introducing IAP to the participants of the meeting. The IAP is a global network of 98 science academies, formed in 1993, 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).

The activities that were developed during the 2004 - 2007 *IAP Initiative on Access to Scientific Information in Developing Countries* included five planning meetings and workshops (Paris, Dakar, Beijing, Sao Paulo and Pretoria); a "World Summit on the Information Society Tool Kit"; several background papers (*"Issues in Open Availability of Digital Scientific Information Resources in Developing Countries"*, "A *Compendium of Resources on the ICT Infrastructure for Promoting Access and Capacity Building for Research and Education in Developing Countries");* a Survey of IAP Members Academies on their ICT Infrastructure and Institutional Repository Capabilities, and finally, based on the outcomes and recommendations from this Initiative, a new *IAP Program on Digital Knowledge Resources & Infrastructure in Developing Countries(2008 – 2010)* was established.

The main goal of this program is to promote a greater access to and use of digital scientific data and information resources, and to digital networks and infrastructure for research and education, with particular attention to capacity building of IAP Member Academies and the research and education communities in developing and transitional economy countries.

The task that this Program will perform are: 1) to hold a series of international workshops and meetings on a regional basis, develop supporting information resources and other outputs, and publish the results on the IAP portal; and 2) to work with other IAP Programs, as well as with other organizations already engaged on these issues, to avoid duplication of effort and leverage existing expertise and resources. Actually there are many activities which have been developed by regional organizations and it is important to use them and to develop common interest resources.

The IAP Program structure includes a Steering Committee with representatives from partner Academies, regional Academy Networks, and other IAP Programs, plus *ex officio* participants from other organizations. There also are two main Task Groups: (1) the Task Group on Promoting Access to and Use of Digital S&T Data and Information; and (2) the Task Group on Promoting Access to and Use of Digital Networks and Infrastructure for Research and Education. He then detailed the specific projects that are to be led by each of these Task Groups:

1. The Task Group on Promoting Access to and Use of Digital S&T Data and Information is involved in the development of specific projects such as:

a. Interactive open knowledge environments online (OKE). This means the integration of openly available scientific information resources with open source collaborative tools online for the creation of new knowledge and targeted problems solving. This is a challenging goal; a new way of using the Internet and an experiment, which will be addressed by IAP Member Academy staff, consultants, expert volunteers, and audience representatives.
b. Open institutional repositories at IAP Member Academies and related organizations, which have been very well addressed during the 3-4 September workshop.
c. Digitization of knowledge resources through the use of ICT infrastructure.
d. Promotion of a Young Scientists Network to involve young scientists through organizations like the U.N. Global Alliance for Enhancing Access to and Application of Scientific Data in Developing Countries (e-SDDC).

2. The Task Group on Promoting Access to and Use of Digital Networks and Infrastructure for Research and Education (in collaboration with leaders and managers of RENs) is involved in the development of the following projects:
a. Regional white papers on the status of ICT infrastructure, gaps, and actions for Science Academies.
b. An advisory role to national governments and international and intergovernmental organizations on implementation and use of RENs.
c. Regional workshops in sub-Saharan Africa of scientific data center managers on networking and collaboration.
The first steps of this IAP Program have been the following:
The First Steering Committee meeting was held in Shanghai, China, on 28-29 May 2008. The International Workshop on Open Availability to Digital Scientific Information Resources in Central America and the Caribbean: Focus on Education and Health for Sustainable Development," Havana, Cuba, 3-4 September 2008, and the IAP Program regional planning meeting on 5 September, were held.
Strategic partnerships and networking with other organizations are being formed, including with e-SDDC, CODATA, Bioline, eIFL.net, IBICT, UNESCO, Internet2, Red CLARA, UBUNTU Net, eGY Africa, and perhaps others.

This planning meeting should define potential collaborations for the Region of Central America and the Caribbean. In this way the participants should agree on at least 1-2 follow-up actions in each of the two main Task Group areas, answering the following

questions: 1. what is the focus of the action?; 2. why is it important?; 3. how will it be done?; and 4. where, who, and when?

Prof. Michael Clegg proposed that it would be very good that the meeting participants introduced themselves and provided a brief description of their interest in the IAP Program.

Discussion by Meeting Participants

Dr. Jorge A. Huete Pérez (Nicaraguan Scientific Association): Although Nicaragua does not have an Academy yet, this Association carries out similar functions. The development of science and technology in Nicaragua is still incipient, and it is important to be aware of this situation, because the scientific development is very uneven throughout the region, as well as connectivity and access to information. It is important to support development in these areas at the national levels, because in most cases national repositories do not exist, and our institutions are still learning about them. There is a great need of advocacy and support, the Academies should play an advisory role on this and to raise awareness of OA and repositories. Specifically in the case of Nicaragua, the efficient use of resources is very important because this country is not a significant science producer, so it is quite important to access the existing resources in other countries of the region.

Dr. María del Carmen Samayoa Grajeda (Academy of Medical, Physical and Natural Sciences of Guatemala): Guatemala is in a similar situation and it is very important to promote open access in her country and in the region. The access to scientific information is difficult and expensive for our researchers, and it is not easy for them to publish in high-impact journals. In this way, OIRs could play an important role.

Dr. María Zunilda Núñez (Academy of Sciences of the Dominican Republic): She explained that she was participating here as an Academy representative and as a representative of the medical community from her country. From the Academy perspective there is a strong focus on producing scientific knowledge and at the national level there are many efforts by the government, but there are big barriers and difficulties to overcome. The question is where to focus efforts? Information is hard to access and expensive. Open access sounds too good to be true, but would be most welcome. Repositories would be a very useful mechanism to promote. Cuba has some very useful examples and a very well organized system, and that is precisely what the Dominican Republic needs. The “Yo, si puedo” program would be appropriate for the Dominican Republic as well. For the Dominican Republic the best way to proceed is

delivering information. However, how are we going to go about it?

Prof. Victor J. Sánchez Urrutia (Panamanian Association for the Advancement of Science): Panama still does not have an Academy of Sciences, but we should focus on OIRs. One of the biggest problems Panama faces is that it is difficult to obtain funding for a project like this, because most of the funding resources are used to address the existing social problems. In this way the social legitimacy of science is promoted. In many cases, the information that is produced from research projects is not made available, however, open access and OIRs for scientific publications are very important.

Prof. Liu Chuang (Chinese Academy of Sciences): According to the Chinese experience open access to scientific data and information is very important. Ten years ago nobody wanted to share information in China. Our researchers considered that scientific information was private and for this reason there was a lot of duplicative work. This was very inefficient and wasteful and it led to changes in data policy and the establishment of the Scientific Data Sharing Program. The Chinese Academy of Sciences (CAS) and the Ministry of Science and Technology (MOST) held a series of meetings with US counterparts to develop a national policy for open access to scientific data, which is now being implemented. There have been international workshops to share experiences, approaches and policies and this has been very useful to lead the change.

Prof. Robert J. Lancashire (Caribbean Academy of Sciences, Jamaica): Specifically in the Caribbean Islands, the scientific work is focused in universities and research centers, but there is a problem of insufficient critical mass. Most activities regarding OA are going on in universities. Although Jamaica has a repository and the Caribbean Academy of Sciences (CAS) has a website, communication and publication are still inadequate in the region and the research groups do not coordinate their works. There is a small number of journals, but some of them are included in SciELO. Workshops on ICT for Development are being held, and the idea of putting publications in open repositories has been discussed, but not yet implemented.

Monika Segbert-Elbert (eIFL.net): eIFL.net is involved in giving access to developing countries and it is working in more than 50 countries all over the world, but as yet is not present in Central America and the Caribbean. Therefore, eIFL.net is very much interested in learning about the needs of the region and to know how to best become involved.

Prof. Jinnian Wang: (Chinese Academy of Sciences): Open access is very important. There are very good experiences in China, for example, in the remote sensing area, through the China-Brazil satellite (CEBERS), which makes data freely available to

developing countries for various applications. However China needs OA to worldwide data and scientific information too.

Dr. Francisco A. Fernandez Nodarse (CITMATEL, Cuba): The Ministry of Science Technology and Environment of Cuba presented its experience in a session at the 4 September workshop. It is quite important to share experiences here because new ways for promoting collaboration, integration and exchange can be implemented.

Session 2. Presentation and discussions of specific projects for promoting access to and use of Research and Education Networks (RENs) in Central America and the Caribbean

Moderator: Dr. Luis Carlos Silva Ayçaguer, National Medical Sciences Information Center (INFOMED), (Cuba).
Rapporteur: Paul F. Uhlir, National Academy of Sciences (NAS), (USA).

Dr. Luis Carlos Silva Ayçaguer, National Medical Sciences Information Center (INFOMED, Cuba): He welcomed all colleagues present at the meeting and thanks them for having expressing their situation and their interest in this Program. These meetings help to fix some south – south and north – south collaboration.

Presentation: Latin American Cooperation of Advanced Networks (Red CLARA), Martha I. Giraldo Jaramillo, High Technology National Academic Network (RENATA), (Colombia).

Dr. Giraldo presented some possible cooperative actions with the IAP Program. The European Commission FP7 Cooperation Program may have some possible funding through a proposal for the ALICE2 Project. This could be a 4 years and € 18 millions Project, in which the European Community would contribute with €12 millions and Latin America would contribute with € 6 millions.

Cuba, Nicaragua, and Honduras are already participating partners in the region. Red CLARA is inviting two representatives (1 technical expert and 1 administrative representative) from these countries to take part in a Technical Meeting which will be held on November 24 – 28 at Rio de Janeiro, and their costs will be covered. These countries do not have to commit any funding on this yet. However, it is necessary to identify a representative institution in each country and to sign a letter of intent. Unfortunately, the Dominican Republic is not included because it is considered in a different geographical area. New countries need to be invited to participate and have to

provide information for this consideration.

Another possibility is a program of virtual digital libraries, which was proposed by Red CLARA with other partners. The InterAmerican Development Bank (IDB) originally rejected this proposal, but is now willing to discuss it again. This could be a good project to partner with the IAP.

Red CLARA is also working on the creation of user communities to ensure the utilization of this network in applications related to the Millennium Development Goals, as well as fostering the collaboration within Latin America and with European Researchers in FP7 priorities. What Red CLARA is trying to do is to foster the creation of regional user communities and to provide them with specially tailored services. It is expected that this will increase the number of research projects involving researchers in all of Latin America, especially in those areas related to the Millennium Development Goals. Several dissemination and training activities are proposed to ensure that Red CLARA reaches the researchers, especially in areas of impact for the region related to the Millennium Development Goals, such as health and disaster prevention. Red CLARA is hiring consultants to identify application communities for funding under the IDB. However, this has not been successful yet.

Dr. Luis Carlos Silva Ayçaguer, National Medical Sciences Information Center (INFOMED, Cuba): Cuba can contribute to this project with its experience in health and disaster mitigation, and this would be a very good choice for this focus. Cuba is open to collaborate and the Academy of Sciences of Cuba could be the coordination body.

Dr. Jorge D. Villa Hernández (National University Network (REDUNIV), Ministry of Higher Education (MES, Cuba): Cuba is involved in Red CLARA since the beginning in June 2003. The by-laws and implementation plan were agreed at that time. However, the connection to optical fiber cables which pass near Cuban coasts has not been possible yet and the country has had to rely on slower and more expensive satellite connections. The situation is that there is an opportunity for Cuba to link to Red CLARA and that the will exists to do it, but mainly there are economic and technical hurdles. At the moment there is a university network and a network of networks which include INFOMED from the Ministry of Public Health (MINSAP); REDUNIV from the Ministry of Higher Education (MES); RIMED from the Ministry of Education (MINED); RED CIENCIA and ISCTN from the Ministry of Science, Technology and Environment (CITMA); CUBARTE from the Ministry of Culture (MINCULT), TINORED (Youth Computing Clubs) and other national networks, but it is still not fully developed nor high-speed (only 128 Kbps – 6 Mbps). There is a need to develop a high speed Cuban Academic network, which should be multi-sectoral and based on

cooperative services and open access.

The possible actions then could be: (1) to boost the creation of the Cuban Academic Network; (2) to alert the government that there is a new opportunity for Cuba to link to Red CLARA and about the fact that this is not only important for Cuba, but for this geographical region too; (3) to promote joint actions among involved Ministries in order to guarantee the sustainability of the Cuban Academic Network in Red CLARA; and (4) to take up again the contacts with the Red CLARA management office.

A very good possibility is that in 2009 there will be an underwater fiber-optic link from Venezuela to Cuba that will link to Red CLARA, but still there is a lack of fiber-optic connections in the country. There is investment at the national level in order to address this situation.

Dr. Martha I. Giraldo Jaramillo (High Technology National Academic Network (RENATA, Colombia): It is important to clarify that there is not only one way to link to Red CLARA. There are countries in which these national networks are subordinated to the government, but there are other countries in which they are subordinated to the universities. If there are actions that do not have to wait for government decisions it would be very good to do it.

Dr. Luis Carlos Silva Ayçaguer, National Medical Sciences Information Center (INFOMED, Cuba): The most important factor is that the will to do this exists and if the whole process has taken such a long time it is not necessary to hurry up now when it may be solved in the short term.

Dr. Francisco A. Fernandez Nodarse (CITMATEL, Cuba): The elements given by Jorge Villa in his previous presentation are very important. At this moment, the Cuban Academic Network is a project in which Cuba is already working. The Academy of Sciences of Cuba gave us the opportunity to exchange ideas and it should serve as interlocutor about this issue.

Prof. Sergio Jorge Pastrana (ACC): The Academy of Sciences of Cuba has an advisory role for science and policy to the government. It has the duty to take part in this debate and to present a proposal to the government, and the Academy will do this. However, the most important point is that when the underwater fiber-optic link to Venezuela is ready, the country be well prepared in order to take advantage from all the possibilities this gives us.

Mr. Paul F. Uhlir (US NAS): It would very good to clarify if Cuba needs some funding in order to link the Cuban institutions to the underwater fiber-optic link to Venezuela.

Dr. Jorge D. Villa Hernández (National University Network (REDUNIV), Ministry of Higher Education (MES, Cuba): The main nodes in Cuba are already linked using optical fiber cables. In this way when the underwater fiber-optic link to Venezuela is finished Cuba will have a stronger infrastructure.

Dr. Ismael J. Clark Arxer (ACC): The technical infrastructure in Cuba is based on optical fiber cables. However, our main problems are the technical and economic hurdles regarding the satellite link access to the Internet, because of its costs and its reduced speed. Now we have an opportunity for multiplying the effectiveness when the underwater fiber-optic link to Venezuela is finished. Although funding is always needed this is not the main problem right now. The Academy of Sciences of Cuba represents the scientific community at the national level and has an advisory role to the government, so it can present a proposal to the government.

Dr. Martha I. Giraldo Jaramillo (High Technology National Academic Network (RENATA, Colombia): It would be very important for Cuba to define how they will link to Red CLARA from a technical viewpoint, because if this will be on Cuba's own resources then you will not need help from Red CLARA on this action.

Prof. Robert J. Lancashire (Caribbean Academy of Sciences, Jamaica): Until a few years ago, Jamaica was dependent on satellite communications. Now the country has optical fiber cable links. Jamaica could link to Red CLARA through the Venezuela-Cuba link.

Mr. Paul F. Uhlir (US NAS): It would be very useful to know if inside the Academies there could be organized Task Groups to be in charge of this from the technical and policy viewpoint. These people could meet to discuss these issues, perhaps in conjunction with Red CLARA meetings. This would be very good because these groups could work on the advancement of common objectives together.

Dr. Martha I. Giraldo Jaramillo (High Technology National Academic Network (RENATA, Colombia): She proposed the creation of a recommendation guide on how the countries that still are not linked to Red CLARA could proceed in order to do this.

<u>Summary of Agreed Actions</u>

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How: Each Academy/S&T Association national representative at this meeting will contact the existing Red CLARA group in their country to become informed about the status of that group and the status of coordination with the research and education communities.

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Action A3: Funding of new activities.

This can be done at the national, regional, and international levels, and through Alice 2 Project, specifically for Nicaragua and Cuba. The Dominican Republic and other countries are not included in the Alice 2 Project, so it is necessary to identify other funding sources.

Session 3. Presentation and discussions of specific projects for promoting access to and use of Open Institutional Repositories in Central America and the Caribbean

Moderator: MSc. Alejandro Caballero Rivero, Academy of Sciences of Cuba (ACC, Cuba)
Rapporteur: Dr. Francisco A. Fernandez Nodarse (CITMATEL, Cuba).

MsC. Alejandro Caballero Rivero, Academy of Sciences of Cuba (ACC): He started the session by reviewing the format for the discussion and explaining its main theme.

Prof. Leslie Chan, Bioline Internacional, (Canada): Prof. Chan presented the Open Access Scholarly Information SourceBook (OASIS). This is a project with seed funding from the Open Society Institute Information Program, which is aimed at creating a one-stop portal for all open access related information, principles, data, policy documents, implementation strategies, and case studies, in order to bring together highly dispersed

resources for use in education, training, advocacy and research (by gathering and presenting relevant data). This project is also aimed at building a community by linking to regional and international experts. OASIS strives to be regional and international and ties in with other ongoing initiatives to reduce duplication of effort

The project already has confirmed many partner organizations, including: Electronic Information for Libraries (eIFL), Copyright Course for Librarians (Berkman Center for Internet and Society); Library of the Chinese Academy of Sciences, Open Access Directories (OAD); SPARC; Science Commons; Sivulile (Open Access South Africa: with outreach to all of Africa); Bioline International; IBICT (Instituto Brasileiro de Informação em Ciência e Tecnologia, Brazil); Indian Institute of Science, India; University of Tasmania (with outreach to Australasian and Pacific Island research communities); Electronic Publishing Trust for Development; *e*Prints at the University of Southampton; Public Knowledge Project; the e-SDDC Young Scientists Forum and open case sharing network; and this IAP Program.

The audience for the OASIS project includes researchers, librarians, funding agencies, policy makers, publishers, and the public. A great amount of information on OA issues will be available: original briefing papers for each key section; existing documentations from diverse sources (SPARC, Science Commons, PKP, eIFL, JISC, IBICT, RSP); translations; invited contributions; case studies; policy papers; interviews (video collection, Open Access Documentary Project). The OASIS portal will use connections for open contributions which will be linked from OASIS once vetted and will host wiki - based input, with link-in from social networking tools.

MsC. Alejandro Caballero Rivero, Academy of Sciences of Cuba (ACC): He thanked Prof. Leslie Chan for his presentation and expressed that this was a very interesting project, aimed at solving one of the main existing problems regarding open access, specifically to bring together highly dispersed resources. This will be a very useful portal and will have a great amount of information and tools.

Mr. Paul F. Uhlir (US NAS): OIRs were very well addressed during the two days workshop. It would be very useful to discuss here the practical steps to implement such repositories and the funding sources that could permit this.

Dr. Martha I. Giraldo Jaramillo (High Technology National Academic Network (RENATA, Colombia): She expressed that it was necessary to begin working at the national level in order to widen the spectrum of possible involved institutions, and after that to organize a regional program. There are previous experiences like the Digital Library, which indicate

this is the right way to do this.

MsC. Alejandro Caballero Rivero, Academy of Sciences of Cuba (ACC): He suggested that this effort could include the Academies of Sciences and universities from this region.

Prof. Victor J. Sánchez Urrutia (Panamanian Association for the Advancement of Science): On the one hand, the organization of a regional program may take a long time and this could be harmful for this project. On the other hand, he is concerned about the technical details of the project, because they will be necessary to develop technical standards, software, etc.

Prof. Anna María Prat Trabal, (SciELO, Chile): SciELO is an excellent experience which already has been tested. It is possible, therefore, to develop a regional experience taking SciELO as a starting point, and to complement it with OIRs. Access to worldwide scientific information is a top priority for this region. Perhaps all this cannot be developed only with a project through Academies of Sciences, however.

Dr. Hélio Kuramoto (Brazilian Institute for Information in Science and Technology (IBICT, Brazil): IBICT has developed a model for scholarly information based on open archives initiative standards and has standards for OIRs, using D-Space and E-Prints software. It is possible to create an OIR infrastructure network in this region and to use the IBICT platform to develop the OIRs and tools, which could then be integrated with OIRs in other regions. It is also important to hold workshops on open access issues and practice in order to show its benefits, and technical meetings to train people in the use of software for these repositories.

MsC. Alejandro Caballero Rivero, Academy of Sciences of Cuba (ACC): The IBICT experience on this issue could be very helpful in order to create a regional OIR infrastructure. This could be complemented with a project for OA Journals through SciELO.

Dr. Barbara E. Kirsop (Electronic Publishing Trust for Development, UK): Recommended the use of already existing tools and standards for developing OIRs. A regional network of this kind should be developed using a bottom-up approach and take into account the existing OAI-compliant network to which any IR using the free software is automatically a part.

Dr. Jorge A. Huete Pérez (Nicaraguan Scientific Association): It is quite important to achieve a national consensus on this issue. However, this requires technical, policy and

legal advice, and it is also necessary to consider the different laws and policies established in each country. At the same time, it is necessary to check the quality of national scientific publications.

Monika Segbert-Elbert (eIFL.net): Presented a brief summary on the "Digital Repository Infrastructure Vision for European Research" (DRIVER) project, which is funded by the European Commission (EC). This project is aimed at making freely available any form of scientific-content resource, including scientific/technical reports, research articles, experimental or observational data, rich media and other digital objects. This repository infrastructure will enable researchers to plug into the new knowledge base and use scientific content in a standardized, open way. DRIVER will be helping countries to create networks of openly-accessible repositories for research information. The EC is developing a derivative project called OVERDRIVER aimed at making the DRIVER project internationalized and this could be an opportunity for developing the OIR infrastructure in this region. Ms. Segbert-Elbert also suggested that participants in this workshop should contact their EC representation at the country level to find out which EU programs for international cooperation (EUROPEAID) exist that might be hospitable to proposals in tune with the agreed actions emanating from this meeting, and to get to know up-coming calls for proposals and their work programs.

Summary of Agreed Actions

Action 1: Open Institutional Repositories infrastructure network.

What: The Central American and Caribbean Academies/S&T Associations at this IAP meeting will develop or enhance research and education coordination and advisory groups in their respective countries to create an Open Institutional Repository infrastructure network in this region.

Why: Open Institutional Repositories (OIRs) are a fundamental component of the research infrastructure in many countries. They increase visibility and research impact through global sharing of data, prevents duplicative work, promote partnerships and collaborative projects, accelerate scientific progress by making information resources easily available, and there are many other benefits that were very well addressed at the meeting. Perhaps most important from the perspective of developing countries, however, is that the establishment of open institutional repositories can counter the current problem of their relative invisibility on the internet at the national, regional and international level. So, it is important for the Academies and S&T Associations of this region to support and to improve the use of OIRs by the scientific and educational communities in each country and at a regional level. The IAP Program is fully consistent with the development of OIRs, so it can help organize and stimulate this action.

How: The Brazilian Institute for Science and Technology Information (IBICT) has developed a model for scholarly information based on open archives initiative standards and has OSS standards for OIRs, using D-Space and E-Prints software. It is possible to create an OIR infrastructure network in this region and to use the IBICT platform to develop the OIRs and tools, which could then be integrated with OIRs in other regions.

SciELO is a successful experience for Latin American region and it could be used as an example. Adding a SciELO repository in each country could be useful as well to promote the establishment of quality OA scientific journals. The planned Open Access Scholarly Information Sourcebook (OASIS) can also be useful in this effort.

Each Academy/S&T Association national representative at this meeting will determine the status of OIRs and OA journals in each country, and determine the existing policy of the science and education ministries with regard to these OA mechanisms.

Once the baseline information is gathered, National Groups will be formed or augmented to include the relevant institutions and OA experts or supporters. These groups will develop a plan for implementing and using OIRs effectively within the national research and education sectors. These groups also should advocate and disseminate the related policies and activities, and will work with the IAP Program and other relevant regional and international organizations to advance these objectives.

Each National Group will select one representative to participate in a regional IAP Working Group that will exchange information and coordinate on activities as appropriate. This Working Group will meet at least once per year, preferably in conjunction with another thematically linked meeting.

Where: The initial activity will involve those countries represented at the September 5 IAP meeting in Havana, but will add other countries according to their interest. IANAS will be asked to help in this regard. The annual regional meetings will be held in different locations, depending on the opportunities for co-location with other related meetings.

Who: The participants at this meeting and others as appropriate, to be determined. The Academy of Sciences of Cuba (ACC) will represent the regional Working Group on the IAP Steering Committee.

When: The first phase of this project, the discussions at the national level, the collection of the background information and an initial draft report, and the formation of the

working group, if possible, will be completed by March 2009. Annual meetings will be held based on the co-location with other regional meetings.

Action 2: Technical Training Meeting for Central America and the Caribbean Region.

A meeting of technical and OA experts will be convened at the regional level after the initial fact-finding survey to explore in greater depth the requirements and ways to implement the OIRs. The organizations details of such a meeting (host, date, etc.) will be discussed further, depending on the opportunities for co-location with other related meetings.

Action 3: Funding of new activities.

The establishing of OIRs in each country needs to be funded. This can be done at the national, regional, and international levels, and in collaboration with the existing OIRs programs and funding programs.

eIFL.net may be able to help if the new European Commission (EC) OVERDRIVER project is approved as this includes international cooperation also with Latin America. eIFL.net is also ready to help by transferring knowledge on the establishment of OIRs in Europe gained in the Europe wide DRIVER I and DRIVER II projects. This organization can also work with the IAP Program on Digital Knowledge Resources and Infrastructure to respond to the EC calls for proposals as a partner. Other funding sources need to be identified and solicited.

Session 4: Summary of Results from Sessions 2 and 3 and Concluding Observations

Chair: Prof. Sergio Jorge Pastrana, Foreign Secretary, Academy of Sciences of Cuba (ACC).

Prof. Sergio Jorge Pastrana (ACC): He thanked all of the participants for having taken part in this meeting and for their contributions to such an important issue.

Dr. Ismael J. Clark Arxer, (ACC): The Academy of Sciences of Cuba offers the IAP the possibility for dissemination of the results of this meeting in the region and at the Caribbean Scientific Union (CSU).

Prof. Sergio Jorge Pastrana (ACC): Prof. Pastrana proposed Mr. Paul F. Uhlir (US NAS) and MSc Alejandro Caballero Rivero (ACC) as possible executives to move forward these

projects.

The participants of the meeting agreed on this proposition.

Prof. Sergio Jorge Pastrana (ACC): He summarized what was agreed at the meeting:
To promote that the Latin American and the Caribbean countries that still are not linked to Red CLARA to join it;
To create a recommendation guide on how to link to Red CLARA;
To work on establishing an Open Institutional Repositories infrastructure in the region;
To develop a technical meeting for technical and open access experts in the region to explore in greater depth the requirements and ways to implement the OIRs; and
To promote specific open access developments at national levels.

Prof. Michael T. Clegg (US NAS): He thanked all of the participants and the representatives of the Academies of Sciences of this region and other organizations for such an encouraging meeting, and especially to the Academy of Sciences of Cuba for having hosted this successful meeting.

Dr. Ismael J. Clark Arxer, (ACC): He thanked Prof. Clegg and in the name of all of the participants, and thanked the simultaneous translation team and the people from Palco Hotel for their excellent work.

For the Academy of Sciences of Cuba it has been a great honor to host this meeting. Now the Academy has more friends than before. It is important for the Academies of Sciences of the countries of Central America and the Caribbean, as well as the Scientific and Technical Associations like the Panamanian Association for the Advancement of Science of Panama or the Nicaraguan Scientific Association, to exercise their role in these different projects. Although these are not lucrative tasks, it is necessary to remember that for the successful work of a network, the most important activities are not of the individual actors, but rather the coordinated work of all its nodes.

The celebration of such a successful meeting confirms the right decision of our colleagues from the National Academy of Sciences (NAS) when they launched the Initiative in the IAP. All of the participants of the meeting, regardless of the different problems may exist in their countries, should put a lot of effort in trying to channel all these agreements that have been reached here into concrete actions. All of the countries of this region would benefit from having people devoted to these activities.

APPENDIX A

Meeting Participants

	Name	Affiliation	Country
1	Michael T. CLEGG	US National Academy of Sciences (NAS)	USA
2	Paul F. UHLIR	US National Academy of Sciences (NAS)	USA
3	Robert J. LANCASHIRE	The Caribbean Academy of Sciences (CAS)	JAMAICA
4	Victor J. SÁNCHEZ URRUTIA	The Panamanian Association for the Advancement of Science(APANAC)	PANAMA
5	María del C. SAMAYOA GRAJEDA	Academy of Medical, Physical and Natural Sciences of Guatemala	GAUTEMALA
6	Jorge A. HUETE PEREZ	Nicaraguan Association for Science	NICARAGUA
7	María Zunilda NÚÑEZ	Academy of Sciences of the Dominican Republic	THE DOMINICAN REPUBLIC
8	Liu CHUANG	Chinese Academy of Sciences (CAS)	CHINA
9	Jinniang WANG	Chinese Academy of Sciences (CAS)	CHINA
10	Hélio KURAMOTO	Brazilian Institute for Information in Science and Technology(IBICT)	BRAZIL
11	Anna María PRAT TRABAL	SciELO Chile	CHILE
12	Barbara E. KIRSOP	Electronic Publishing Trust for Development (EPT)	UNITED KINGDOM
13	Martha I. GIRALDO JARAMILLO	High Technology National Academic Network (RENATA)	COLOMBIA

14	Lewis Joel GREENE	Brazilian Journal of Medical and Biological Research	BRAZIL
15	Monika SEGBERT-ELBERT	Electronic Information for Libraries (eIFL.net)	UNITED KINGDOM
16	Leslie CHANG	Bioline International	CANADA
17	Luis C. SILVA AYÇAGUER	National Medical Sciences Information Center (INFOMED)	CUBA
18	Jorge D. VILLA HERNáNDEZ	Ministry of Higher Education (MES)	CUBA
19	Raúl G. TORRICELLA MORALES	Ministry of Higher Education (MES)	CUBA
20	Francisco FERNÁNDEZ NODARSE	CITMATEL	CUBA
21	Ismael J. CLARK ARXER	President, Academy of Sciences of Cuba (ACC)	CUBA
22	Sergio JORGE PASTRANA	Foreign Secretary, Academy of Sciences of Cuba (ACC)	CUBA
23	Alejandro CABALLERO RIVERO	Academy of Sciences of Cuba (ACC)	CUBA
24	Luis E. RAMOS GUADALUPE	Academy of Sciences of Cuba (ACC)	CUBA

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