



eGY-Africa

- improving Internet access for science in Africa

DRAFT PLAN

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<i>SUMMARY</i>	1
<i>Inspirational goal</i>	2
<i>The eGY framework and beyond</i>	2
<i>The Problem</i>	2
<i>Drivers behind eGY-Africa</i>	2
<i>Strategy</i>	3
<i>Benefits of Internet connectivity</i>	4
<i>Ten points for improving Internet performance</i>	4
<i>Next Steps for eGY-Africa</i>	5
<i>Activities for participants</i>	6
<i>National eGY-Africa groups</i>	6
<i>eGY-Africa Organisers</i>	7
<i>People and bodies to liaise with</i>	7
<i>ORGANISERS for 2009 eGY-Africa workshop</i>	7
<i>Funding requirements</i>	8
<i>Acronyms and websites</i>	8
<i>Calendar of main events</i>	9

Supplementary documentation

- eGY-Africa Plan – this document
- eGY-Africa questionnaire – for the survey of Internet connectivity.
- eGY-Africa people – list of organisers, participants and affiliates (observers)
- IHY-Africa Resolution – resolution advocating better internet connectivity for universities and institutions in African countries.
- Reports and publications.

(downloadable from www.egy.org and <http://groups.google.com/group/egyafrika>)

SUMMARY

Effective Internet access underpins development and human welfare in Africa, as elsewhere, by strengthening science education and training, expanding science capability, opening up collaboration opportunities with the rest of the world, and generating the knowledge base for decision-making.

Poor Internet connectivity prevents many countries in Africa from taking advantage of these opportunities.

eGY-Africa is a 'bottom-up' effort to secure better Internet connectivity for science education and research institutions in Africa by using the voice (advocacy) of the scientific community at national, regional, and international levels to influence decision making and aid policy.

This plan describes the basis for undertaking the eGY-Africa initiative, the objectives, and a work program. eGY-Africa is an [Electronic Geophysical Year, 2007-2008](http://www.egy.org) activity, driven by scientists from the Earth and space science community.

Inspirational goal

The central goal of eGY-Africa is to make African communities wealthier, safer, and more sustainable through full participation in the information revolution.

The Internet is a powerful and efficient method of providing scientists, students, educators, and the public throughout the world with ready access to data, information, and services. It also permits unprecedented collaboration and sharing of information and expertise. These benefits are particularly valuable for people in developing countries who have limited resources for travel, data acquisition, and computational/analysis facilities.

The eGY framework and beyond

The International Geophysical Year, 1957-1958 (IGY) achieved unprecedented cooperation among nations to acquire and share geoscientific information. Today, 50 years later, the Electronic Geophysical Year, 2007-2008 (eGY), sets out to extend the IGY principles of providing ready and open access to data and information about the Earth and its space environment. Modern information and communications technologies are having a huge impact on the scope and efficiency of the science that we now undertake – observations, data access and sharing, data discovery, data preservation data mining, computation and analysis, modelling, visualisation, and open access electronic publishing. Communities lacking adequate Internet access are cut off from these exciting capabilities. One of the stated themes of eGY is to reduce the digital divide. eGY is, therefore, a time to promote better access to the Internet in Africa so that African scientists, students, and educators can share on equal terms with industrialised countries the benefits of the global information revolution.

eGY runs from July 2007 to December 2008, so some activities may only get started during the eGY period. Both IUGG and CODATA plan to continue certain eGY functions beyond 2008, which will provide an organisational framework for continuing eGY-Africa activities to completion.

The Problem

Participation in the information revolution is conditional on the existence of a cyber infrastructure to connect people and machines to the world community and the vast resources of information and services that exist. This is particularly important for scientists and technologists who have the responsibility of producing and using information and knowledge to deliver societal benefits. Modern ICT is marketed as a fast and low-cost way for poor communities to share on equal terms with rich ones the benefits of the information revolution. In practice, the digital divide is growing and denying poor countries access to those very benefits.

The reality is different. Science researchers, educators, and students in Africa are not able to take advantage of this wonderful opportunity because they lack adequate computer facilities and access to the Internet. Instead of becoming more empowered and involved in worldwide developments, they are becoming increasingly marginalised as the world of education and science becomes increasingly Internet-dependent. In places where Internet facilities do exist, they are often available only through the private sector at high cost. This so-called digital divide appears to be increasing.

Drivers behind eGY-Africa

- Africa is largely isolated from the information society. Better connectivity to the Internet is required to reduce this digital divide.
- The inadequate state of Internet facilities in Africa, particularly in schools, Universities, and other institutions, is already being addressed by top policy-defining and policy

advocacy bodies in Africa, such as the African Union, the UN Economic Commission for Africa, NEPAD, and the e-Africa Commission.

- IUGG is committed to strengthen science (particularly geoscience) in Africa via the *Geoscience in Africa* initiative. The other eight GeoUnions (see table below) are signatories to *Geoscience in Africa*.
- ICSU has established a Regional Office in Africa (ROA). The Director, Prof. Sospeter Muhongo, recognises that effective access to the Internet is essential in order to realize ROA and ICSU objectives.
- CODATA is expanding internationally its role in data science and information society (science information commons) developments. CODATA has committed to a *Global Information Commons for Science Initiative* (GICSI) as one of its central programs. Reducing the digital divide is a specific goal of GICSI. Africa's needs are seen as paramount.
- The Electronic Geophysical Year, 2007-2008 (eGY) provides an opportunity to highlight e-Science needs in Africa and provide a target for focusing international effort on reducing the digital divide.

Strategy

eGY-Africa's strategy is to contribute to the efforts of top international science and African development bodies by providing a focus for the science community to lend its voice in support of high-level policy recommendations, and by influencing, at the local, national, and regional levels, those responsible for providing Internet services to Universities and related institutions.

The key steps to be taken are:

(1) ESTABLISH AN OPERATIONAL FRAMEWORK

Establish a group of motivated people to organise and participate in the initiative, both within and outside Africa, with coordinators identified for each African country. Use existing networks when possible (e.g., the IHY national coordinators and the CODATA national delegates).

(2) COLLECT INFORMATION

Assemble reference information, including case histories, to be used as a basis for consultation, raising awareness, and backing up arguments why governments and donors should invest in Internet facilities:

- a. Survey the present status of Internet access for (geo)science and education for each country or region in Africa, developments that are underway, and plans for the future.
- b. Identify the problems and limitations encountered by scientists and educators
- c. List the benefits of good Internet access, the reasons for investing in infrastructure, and recommendations
- d. Find out what top-down action is being taken and what policies are in place, - through the African Union, the Economic Commission for Africa, NEPAD, ICSU's Regional Office for Africa, and others.

(3) TAKE ACTION

- a. Identify areas and targets for advocacy, where scientists individually and through special interest groups, institutions, national, and international bodies can influence decisions about resource and aid allocations to improve Internet services.
- b. Engage with bodies and decision-makers to raise the profile of the needs of scientists and educators, and increasing awareness of the benefits of providing better Internet services.

Benefits of Internet connectivity

Internet connectivity builds capacity in science, technology, education, and training. Hence it improves efficient productivity and delivers on the investment in education and science.

Specific benefits are

- Efficient communication locally, nationally, and internationally
- Access to the wealth of openly available teaching materials, resources, and services via the Internet; access to e-learning resources
- Access to research support: data and information, computational, analysis, and visualization capabilities, and other Web services.
- Access to the growing number of open scientific publications and other e-literature.
- African scientists and educators can be part of the global village
- Ready participation in international science projects and organisations (benefits are reciprocal)
- Raised African voice and influence in the national and global scientific communities
- Better access by policy and decision makers to indigenous scientific data and information
- Reduced reliance on foreign consultants and experts
- Transmission of observational data from field instruments to base-stations
- Reduced brain drain

Ten points for improving Internet performance

These points were provided by Les Cottrell, (Stanford Linear Accelerator), the International Committee on Future Accelerators (ICFA), and the Standing Committee on Inter-regional Connectivity (SCIC).

Many different digital divides exist - by region, country, within countries, age groups, and so forth. How one reduces a digital divide varies from country to country, region to region etc. Based on experience in Brazil, Romania, Pakistan and India, tackling the digital divide typically involves a combination of the following.

1. **Recognize** that it is not possible to fix all ills for all people over night.
2. **Identify where to focus** and invest effort. One good area is educating teachers and students so they can teach others. Hence a focus on education and basic (University) research is a good place to start.
3. **Choose a champion** application (e.g. education, science, telemedicine, video conferencing, distance learning) that will convince decision makers of the value of investing in good Internet facilities.
4. **Find energetic leaders** who can communicate the way forward and the benefits to be gained.
5. **Engage policy makers** for science, ICT, research, technology, education, and training to raise their awareness of the realities of the Information era, and help them understand the benefits to their country/region/community of good internet connectivity and digital literacy in terms of increased productivity. Encourage policy makers to provide inducements for ICT development, networking, and Internet adoption, e.g. by addressing funding, taxation, regulation, competition, creating incentives, and rewarding effort.
6. **Collaborate among institutions** in a region, different leading disciplines, and among countries (e.g. for Internet Exchange Points) to increase influence, provide leadership, and strengthen negotiation and collective bargaining positions. Consider forming a consortium of institutions as a basis for collaboration.
7. **Form partnerships with vendors** of equipment, communications infrastructure (fibre), Internet services, and so on - to lead the way, showcase leadership, demonstrate cost-effectiveness, drive market penetration, and create demand. Establishment of good Internet connectivity is a long-term investments for the future, both for the company and for the country/region.

8. **Get statements and cost-benefit examples** from collaborators in other countries and internationally, and from organizations such as IHY, ICTP, ICFA, HEP, and professional societies (national and overseas).
9. **Utilize** measurements and case histories to quantify, inform, support the case for improving facilities, and leverage on the envy and shame factors. Case histories could include ITU, UNDP, PingER, World Bank, CIA
10. **Get funding** from agencies such as NSF, NASA, GEANT, EU, World Bank, Foundations, large/multinational companies (telecoms, mining, petroleum ...)

Next Steps for eGY-Africa

These steps are not in order of priority, and many can be carried out simultaneously.

OPERATIONAL FRAMEWORK

- (1) Establish a core team
- (2) Maintain a website and news service for communications and reference documentation.
- (3) Expand the group of participants, supporters, and observers.
- (4) Establish a national group in each country, with one lead correspondent, to be responsible for collecting survey information, consultation with authorities, and advocacy activities.

COLLECT INFORMATION

- (5) Undertake a survey of Internet capabilities, requirements, problems, solutions and so forth via a questionnaire.
- (6) Measure Internet capability – the PingER project.
- (7) Compile reference information about existing Internet capabilities and plans for development– their status, acceptability, effectiveness, and problems. The main emphasis to be on services available for scientists and educators.
- (8) Open a dialog with top policy bodies dealing with ICT issues in Africa, e.g., UNECA, NEPAD, ICSU. Collate information about resolutions, policies, and activities directed at reducing the Digital Divide.
- (9) Open a dialog and develop partnerships with the international scientific community and agencies, e.g., ICSU, IUGG and its Associations, IUGS and other GeoUnions, CODATA, IHY-Africa, ICTP, EGEE, WDC Panel, GEO/GEOSS, and CEOS-WGISS. Collate information about statements, policy, and activities related to the Digital Divide issue.

MEETINGS

- (10) 2008: host meetings of national groups interested in the Internet issue.
- (11) 2009: host a pan-African meeting for eGY-Africa, probably in a francophone country (Senegal?). A provisional list of organisers arrears below.

FUNDING

- (12) Seek funding in support of national eGY-Africa activities, the pan-Africa meeting in 2009, and administrative costs for running eGY-Africa (most work is done voluntarily, but some travel costs are unavoidable).
- (13) Seek patrons – e.g., Google Earth, Microsoft Virtual Earth, various Foundations.
- (14) Prepare case studies to illustrate where resources are most needed to improve Internet access..

ADVOCATE

- (15) Bring coordinated opinion to bear on areas where the advocacy of the national and international science communities might influence decision makers and potential donors.

Activities for participants

Here is a list of possible activities for those who wish to participate in the eGY-Africa effort. It is not necessary to undertake all the activities listed; any level of participation is useful. For many activities, it may be more effective to work through a coordinated national or institutional group rather than as an individual.

1. Keep in touch with the entire eGY-Africa effort. Use www.egy.org/eGY-Africa and <http://groups.google.com/group/egyafrika> for sharing and storing reference information. Let others know about Internet service developments in your country and elsewhere in Africa, opportunities that arise, meetings, and so forth.
2. Contribute to the planning and policy of eGY-Africa. Comment on and improve the draft plan. Propose additional participants for eGY-Africa. Suggest agencies and programs in Africa that are concerned with improving ICT capabilities in Africa
3. Undertake survey work and report about Internet facilities in your country, covering the present status, new development that is taking place, and plans for the future.
4. Identify successes, limitations, problems, and failures that have occurred. Document case histories when possible, to be used as lesson-to-be-learned.
5. Raise awareness in your country/region about the Internet access problem via meetings, publications, news articles, press releases, and so forth.
6. Help establish and contribute to a national group of both users and providers who are willing to work together to improve Internet services for science and education.
7. Take action at the individual level to influence decisions about providing and maintaining better access to the Internet.

National eGY-Africa groups

National groups of scientists and educators who share a common interest in improving their access to the Internet provide the basis for achieving the goals of eGY-Africa. The aim of national groups is to provide a national discussion forum and a national focus for action to improve Internet services for science and education.

Listed below are possible activities for national eGY-Africa groups to consider. Most of the activities listed for individual participants apply equally to national groups. So only additional suggestions are listed here. The activities proposed can equally well be undertaken by smaller regional or institutional groups.

8. Undertake activities 1 through 5 above in a coordinated national context.
9. Invite new members to your national group so as to cover a wide range of scientific disciplines, educators, decision makers, and providers of infrastructure and internet services. Are there persons in your country who are already engaged in ICT development programs that you need to be in contact with? Find out what they are doing and work with them.
10. Organise national meetings and workshops as a means of collecting information and raising awareness - for example by documenting case histories and passing resolutions. The year 2008 is designated for national groups to assemble and meet. Following on, an Africa-wide eGY-Africa meeting is planned for 2009 in a francophone country.
11. Identify ways, and take action at the national, Africa-wide, and international levels to influence decisions to promote better Internet services. We can do this both in a "bottom-up" manner, and also in support of high-level policy statements from the African Union, UN Economic Commission for Africa, NEPAD, and others

eGY-Africa Organisers

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Victor Chukwuma (Co-chair)	Olabisi Obalajo Univ., Ago Lwoye, Nigeria	victorchukwuma@yahoo.com ,

People and bodies to liaise with

African Union		
UNECA – UN Economic Commission for Africa	Dozie Ezigbalike Aida Opoku-Mensah	www.uneca.org
NEPAD		
TWAS	Third World Academy of Sciences	
IAP	Interacademies Panel	
ANSTI	African Network of Scientific and Technological Institutions	http://www.ansti.org/
AAS	African Academy of Sciences	
AAU	Association of African Universities	
ASADI	Africa Science Academy Development Initiative	http://www.nationalacademies.org/naip/about.html
ACBF	African Capacity Building Foundation	
GSA	Geological Society of Africa	www.elsevier.com/locate/gsa
ICSU's ROA	Prof. Sospeter Muhongo	s.muhongo@icsu-africa.org
ICSU's RCA	Regional Committee for Africa	
GIA-IUGG's Geoscience in Africa	Prof. Uri Shamir	shamir@techunix.technion.ac.il
CODATA	ICSU's Committee on Data for Science & Technology	http://www.codata.org/
CODATA-South Africa	Prof. Steve Rossouw	steveros@iafrica.com
CODATA-Senegal	?	
EGEE director	R. Jones, CERN (via Monique)	
IHY National officers	See Gopal's list	
AEON – Africa Earth Obs Network	Maarten de Wit	
Mag Anomaly map Africa	Colin Reeves, Tiku Ravat	
Geophysics contacts	Kathy Whaler	
MT contacts	Alan Jones	
..... others		

ORGANISERS for 2009 eGY-Africa workshop

ORGANISERS	
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Funding requirements

Support is needed initially to cover the following.

Item	2008 (USD)	2009 (USD)
Operating costs for the Secretariat in University of Melelle, Ethiopia	1000	1000
Travel for Alem Mebrahtu from Ethiopia to eGY General Meeting, Boulder, CO	3000	nil
Travel in 2008 for scientists to travel to national eGY-Africa meetings in their own country	20,000	20,000
Travel in 2009 for scientists to travel to the Pan-Africa eGY-Africa workshop in W. Africa		100,000
Continuation of the PingER project to monitor internet performance	20% FTE 5000 travel	20% FTE 5000 travel
Salary for a professional Secretary (2 days per week)	20,000	20,000

Acronyms and websites

CEOS	Committee on Earth Observation Satellites	www.ceos.org
CODATA	ICSU's Committee on Data for Science & Technology	http://www.codata.org/
EGEE	Enabling Grid for e-Science	www.eu-egee.org
GEO	Intergovernmental Group on Earth Observations	http://earthobservations.org
GEOSS	Global Earth Observing System of Systems	http://www.earthobservations.org/index.html http://www.epa.gov/geoss/index.html
GIA	IUGG's cGeoscience in Africa initiative	
GICSI	CODATA'S Global information Commons for Science Initiative	
ICSU	International Council for Science	http://www.icsu.org/
ICTP	Intl Centre for Theoretical Physics, Trieste	www.ictp.it/
IGY	International Geophysical Year, 1957-1958	
IHY	International Heliophysical Year	http://ihy2007.org/
NEPAD	New Partnership for Africa's Development	http://www.nepad.org/
ROA	ICSU's Regional Office for Africa	www.icsu-africa.org
UNECA	UN Economic Commission for Africa	www.uneca.org
WDC	ICSU's World Data Centre Panel	
WGISS	CEOS Working Group on Information Systems and Services	http://wgiss.ceos.org/aboutwgiss.html
The GeoUnions		
IAU	International Astronomical Union	www.iau.org
IGU	International Geographical Union	http://www.igu-net.org/
ISPRS	International Society for Photogrammetry and Remote Sensing	http://www.isprs.org/
IUCS	International Union of Cryospheric Sciences	
IUGG	International Union of Geodesy & Geophysics	www.iugg.org
IUGS	International Union of Geological Sciences	http://www.iugs.org/
IUSS	International Union of Soil Sciences	www.iuss.org
URSI	URSI – Union Radio-Scientifique Internationale	

Calendar of main events

2006

- 13-14 Mar 06 eGY-Africa concept mentioned at the eGY General Meeting, LASP, Boulder, USA
27 Oct 06 eGY-Africa discussed at the CODATA Conference, Beijing.
9 Nov 06 Discussed and supported by the President of IUGG, Prof. Uri Shamir.

2007

- 14 Mar 07 eGY-Africa endorsed at the eGY General Meeting, NCAR, Boulder, USA
7 Jul 07 Launch of eGY, IUGG General Assembly, Perugia, Italy
9 Jul 07 1st eGY-Africa planning meeting, Perugia. Supported by Thomas Rosswall (ICSU), Sospeter Muhongo (ICSU ROA) and Uri Shamir (IUGG)
29-30 Oct 07 Connect Africa Summit, Kigali <http://www.itu.int/ITU-D/connect/africa/2007/summit/index.html>
12-16 Nov 07 IHY Africa Space Weather Workshop, Ghion Hotel, Addis Ababa <http://kuiper.colorado.edu/IHY-Africa> eGY-Africa discussion meeting and 2nd planning meeting. Secretary appointed, and new participants engaged.
16 Nov 07 Visit to UN Economic Commission for Africa HQ, Addis Ababa (Dozie Ezigbalike, Meron Kinfermichael, Thierry H. Amoussougbo and Aida Opoku-Mensah) by D.Murr, A.Mebrahtu, and C.Barton. UNECA voiced support for eGY-Africa and agreed to help develop documentation regarding policy.
21 Nov 07 Visit to ICSU's Regional Office for Africa, Pretoria (Achoo Enow and Sospeter Muhongo) by C.Barton. ROA voiced support for eGY-Africa and will advise about high level policy decisions.
10-12 Dec 07 "[Internet & Grids in Africa: An Asset for African Scientists for the Benefit of African Society](#)", Montpellier, France.

2008

- during 2008 National eGY-Africa meetings
3-7 Mar 08 Science with Africa conference, Addis Ababa, Ethiopia.
5-6 Mar 08 eGY General Meeting, NCAR, Boulder, Colorado; 3rd eGY-Africa planning meeting.
14-16 May 08 3rd IST-Africa conference, Windhoek, Namibia (European Commission ICT)
20-24 Oct 08 ICSU General Assembly, Maputo
31 Dec 08 Official end of eGY. (eGY-Africa continues)

2009

- 2009 Pan-Africa eGY-Africa General Meeting, to be held in a francophone country.
