

Capacity Building for Efficient Use of Geospatial Information

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EXTENDED ABSTRACT

1. INTRODUCTION

Capacity Building is something of a buzzword nowadays, and it is not at all clear that everyone means the same thing when they talk about it. Google contains a site with 13 definitions of capacity building for different application and, not surprisingly, there are many differences. To quote 2 examples:

- 'Efforts aimed to develop human skills or societal infrastructures within a community or organization
- '(Development of) facilities, programs or other resources which help develop a community's (organization or group) ability to perform specific tasks.'

For the purposes of this paper we will take the second definition and adopt it for geospatial information (GI):

- 'Capacity Building for geospatial information is the provision of facilities, programmes or other resources in the area of geospatial information which help develop a community's ability to perform specific tasks requiring such information.'

Within the context of GI there are many activities. These are represented by the members of The Joint Board of Spatial Information Societies¹ (JBGIS). Such topics as use of imagery, spatial data infrastructure (SDI), land management, reference frames and global mapping, clearly fall within this area. We may take two clear examples of the need for capacity building for GI:

- The ability to use Earth observation data to predict, mitigate and respond to natural disasters;
- The use of spatial data infrastructure to provide information to help government provide a better service, and for society to be able to make efficient use of the information .

Capacity building is undertaken by a number of organisations. Educational and training establishments can provide the basic knowledge and skills, but they need to be supported by government or donor agencies in order to extend beyond a local provision and to connect with users. Hence organisations such as the United Nations or the World Bank are primary agents

¹ The members of the Joint Board are: FIG, ISPRS, ICA, IAG, IHO, ISCGM, IMTA. See www.fig.net/jbgis

of capacity building. This is done as part of the remit of these organisations ‘to promote social progress and better standards of life in larger freedom’.

2. CAPACITY BUILDING FOR GI IN AFRICA

In order to find out more about what is happening in Africa to support capacity building for geospatial information the Joint Board of Spatial Information Societies has set up a committee to look into what is happening and to advise the Board on what further steps might be taken. The first stage of this activity has been to compile a list of organisations involved in capacity building. This list can be found on www.fig.net/jbgis. The list includes 27 organisations which break down into a number of categories: IGOs such as UN agencies, CEOS and GEO; international and regional societies; regional and national centres and others.

A list of activities has also been assembled. It is intended that this information will be kept continually under review and it is hoped that this will be supported by the organisations involved in capacity building. The Joint Board will discuss this information at its next meeting and develop a plan of action to develop these activities, considering such options as a bulletin board or email network.

3. EXAMPLES OF CAPACITY BUILDING

There are some good examples of examples of capacity building in Africa.

- *NigeriaSat-1* (Kufoniyi and Akinyede, 2004): The first Nigerian satellite, a microsatellite called NigeriaSat-1, was successfully launched into low earth orbit on 27th September 2003. The choice of NigeriaSat-1 was influenced by its low cost, affordability and the advantage of comparable performance to the expensive large satellites and the possibility to support capacity building. Fifteen Nigerian engineers/scientists were trained in all aspects of satellite technology including ground station management.
- *African Resource Management Satellite Project* (Kufoniyi and Akinyede, 2004): A joint satellite programme of South Africa, Nigeria and Algeria and any other interested country in Africa will form the cornerstone of the African Resource Management (ARM) Satellite Constellation, laying the foundation of sustainable technology development in Africa. The ARM initiative was proposed by South Africa and supported by Nigeria. The project is one of the key flagship projects in the NEPAD Science and Technology Ministerial Programme areas. The countries involved would collaborate in building capacity to support space programmes in Africa.
- *African Reference Frame (AFREF)* (<http://geoinfo.uneca.org/afref>) is a project to set up a geodetic framework for GNSS in Africa, built on the existing sparse network of continuously operating GPS stations. The project calls for hardware, software and training to install, support and use the GPS network. AFREF is supported by UN and NMOs have signed up to it.

- *Mapping Africa for Africa*. (Nyapola, 2005). Mapping Africa for Africa (MAFA) is a new initiative basically intended to accelerate the pace of geo-information activities in Africa, set up by the Geo-information sub-committee (CODI-Geo) and supported by the African Countries represented by their National Mapping Organisations or organizations responsible for spatial data infrastructure, and by the International Cartographic Association. A plan of action to provide the fundamental geo-spatial information for sustainable development in support of various projects under NEPAD has been agreed. The terms of reference of the Working Group set up by ICA are as follows:
 - Promote international technical and scientific support, and advisory services from ICA and its affiliate members for mapping Africa for Africa projects.
 - Aid in capacity building and knowledge sharing.
 - Support mapping projects for Mapping Africa for Africa.
 - Encourage African countries to participate in ICA activities.
 - Facilitate cartographic outreach programmes in Africa.
 - Promote awareness of cartographic issues and resources.

- *EIS-AFRICA* (www.eis-africa.org) consolidates ten years of investment and capacity building efforts in Environmental Information Systems (EIS) in sub-Saharan Africa into an Africa-wide organisation promoting the greater use of harmonised geo-spatial information. EIS-AFRICA is a non-profit pan-African organisation of geo-information practitioners and institutions. It is based in Pretoria, South Africa, and is governed by an international executive committee. EIS Africa publishes a newsletter and supports many capacity building activities throughout Africa. The mission of EIS-AFRICA is to develop African capacity to generate, manage, disseminate and use geo-spatial and environmental information to enrich policy debate and support decision-making for the well-being of African people.

- *GEOSS* is the Global Observing System of Systems, initiated by the Group on Earth Observation (GEO) (earthobservations.org). GEO was set up at a summit of ministers in Brussels in 2005 and has established a 10 year implementation plan which includes an important element of capacity building. The GEO capacity building strategy follows the concept promoted by the World Summit on Sustainable Development: an equal partnership between those whose capacity needs development and those who are able to assist in the process, recognizing that activities have intertwined social, environmental, and economic impacts. The GEO capacity building strategy will be based on best practices derived from studying successful and less-successful approaches.

The two year plan calls on GEOSS to:

- Produce a comprehensive review and analysis of gaps and methodologies, based on existing capacity building efforts;
- Facilitate, with existing efforts, the maintenance and strengthening of education and training;
- Facilitate, with developing countries, the establishment and maintenance of baseline sites for global in situ networks that cannot always be justified nationally;

- Develop a network of experts involved in existing capacity building initiatives related to Earth observation.
- GEOSS also has longer term plans to fully implement the system.

4. FUTURE REQUIREMENTS

Clearly much more needs to be done. At a GEOSS Workshop held in Pretoria before Africa GIS2005 discussions were held between representatives from GEOSS and end users in Africa, some of the conclusions are listed, not necessarily in order of priority:

- More money is needed.
- Better understanding of the problems is required, this involves first the identification and then the participation of user groups, and then better communication.
- An inventory of required data is needed
- There are particular technical problems for Africa which include:
 - poor infrastructure;
 - low bandwidth;
 - lack of interoperability and metadata (not just an African problem);
 - basic technology equipment is needed – training is no use without equipment;
 - georeferenced data is required.
- Lack of spatial literacy and education on use of GI in schools.
- Lack of political will.
- Poor communications amongst African governments.

Some solutions were also put forward. These were particularly made in the context of GEOSS and the use of Earth observation data, but many of these are generic:

- Long term, sustainable, national environmental programmes run by national governments.
- More networking.
- Training needs to be recurrent with a long term commitment.
- Poor communications amongst African governments GEOSS (SDI) can act as a rallying point, therefore outreach to ministers is needed.
- Need for good communication: between scientists, between disciplines and to policy makers; GEOSS can act as a catalyst and listen to end users, particularly non specialists.
- GEOSS must be more regionally relevant
- GEOSS must make more use of existing systems and capacity building efforts, provide easy to use tools.
- Outreach to African politicians, GEO should be able to provide political clout.

5. CONCLUSIONS

There is a real challenge here for all organisations involved in the development and use of GI and education in the use of Geospatial Information: that is to raise the profile of GI, to make people realise how useful it can be. Geospatial information can cross many boundaries

because of its interdisciplinary nature, it can act as a catalyst to bring people together to solve societal problems and it is up to our international community to seize this opportunity, recognise the problems, and work to solve them.

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