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**Report on the Workshop on use of Geoinformation in
Development**

Report on the Workshop on use of Geoinformation in Development

Organized jointly by the Economic commission for Africa and the Human Sciences Research Council

Date: 23-24 April 2005, Large Briefing room, UNCC, Addis Ababa, Ethiopia

Place: United Nations Conference center, Addis Ababa, Ethiopia

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Participation: See Annex I

The workshop was mainly discussions on the factors enabling the use of geoinformation in Africa's development. The session started on April 23, 2005 at 9:30 and ended the following day at 7:00. Please find attached the wrap up brief that came out of the two-day deliberation on the subject matter.

1. INTRODUCTION

Africa at present does not have all the geoinformation it requires to effectively implement development on the continent (UNECA, 2000). There is no doubt that the use of geoinformation will be critical in the future development of Africa (Zietsman, 1998). This is because geoinformation and GIS is one of the few technologies that enable the effective integration of a diversity of data sets needed for effective decision-making in Africa (Akinyemi, 2003). There are many initiatives across the continent that are gathering the geoinformation needed for Africa's development (NRC, 2002).

An issue that will have to be addressed in this regard is the coordination of these efforts to ensure that they meet the needs of strategies such as the New Partnership for Africa's Development (NEPAD), the African Peer Review Mechanism (APRM) and development plans implemented by Africa's Regional Economic Communities (REC) (UNECA, 2000). A further major issue that has always confronted GIS professionals, who tend to be more technology orientated in their approaches, is how to get the geoinformation that has been developed more effectively incorporated into the decision-making processes of the REC and a political strategy such as NEPAD. Research done by Brent Hall et al in 1998 has shown little evidence of GIS functioning satisfactorily within Africa or being used effectively in decision-making. Therefore, the intention was to hold a pre-workshop with decision makers from RECs, NEPAD and the APRM at the UNECA's CODI-IV meeting in April 2005 where they were to give presentations on what they see are the factors that will enable the sustainable use of geoinformation in decision making in development plans of Africa.

Unfortunately, it was not possible to get the decision-makers to CODI and, therefore, it was decided to discuss with workshop participants what are the factors affecting

the use of geoinformation in decision-making on the continent, in sub-regions and at a national level. Initially, the participants gave an overview of why they were attending the workshop and what they would like to get out of it. Through this process issues were identified and discussed. It was emphasized to participants that they should think laterally about the issues raised so that suggestions could be made on how geoinformation could be more effectively incorporated into the decision making processes of Africa's development at a national, sub-regional and regional level.

2. FACTORS AFFECTING THE USE OF GEOINFORMATION

Fourteen factors were identified by workshop participants that they felt needed to be addressed in getting geoinformation used in decision-making on the continent. These factors were:

- i. Defining what are fundamental and core data sets
- ii. Looking at the role of National Spatial Data Infrastructure (NSDI) Committees
- iii. Looking at the role of international initiatives in Africa
- iv. Looking at communication and dissemination
- v. Whose responsibility is it to coordinate geoinformation on the continent
- vi. What capacity building needs to be done
- vii. Generating awareness or popularizing the use of geoinformation amongst decision makers
- viii. Lack of geoinformation infrastructure at the sub-regional level
- ix. Funding for the collection of geoinformation data sets.
- x. The influence that Overseas Development Agencies (ODA) have on the funding of geoinformation
- xi. Undertake an inventory of data sets at a national level
- xii. The lack of action arising from for a regional and sub-regional forums
- xiii. The lack of best practices and problem orientated prototypes in the different geoinformation sectors.
- xiv. Lack of geoinformation policies

2.1 Generating awareness or popularizing the use of geoinformation amongst decision makers

Within the global information society the importance of geoinformation for decision-making is hardly acknowledged. At the recent World Summit on the Information Society the only mention of geoinformation came from the African continent. In many countries in Africa decision-makers are also not aware of the value of geoinformation. Consequently, it is necessary that organizations and practitioners lobby decision-makers at an international, regional, sub-regional and national level to ensure that they are made aware of the value of geoinformation.

The workshop participants emphasized that decision-makers need to be made aware of the use and application of geoinformation in their decision-making. This could be done through the holding of geoinformation forums at a national and sub-regional level. The problem is that present forums tend to focus on the geoinformation professional or technologist and not the decision-maker.

Another possible way to approach this issue is to hold national workshops that involve decision makers and look at the development of a national geoinformation plan. At the workshop it is important to present geoinformation as simply as possible so that decision-makers can understand its value in addressing the societal problems that a country or sub-region is facing (e.g. poverty). To popularize geoinformation it is necessary to use geoinformation to address key problems that a country or sub-

region is addressing. An examination of national and sub-regional strategies and policies will often provide an understanding of what are these problems. It is important to present geoinformation to decision-makers so that it makes sense, especially in relation to the financial benefits or Returns on Investment (ROI) that might accrue.

Multi-national organizations also have an important role to play. Many of these organizations are responsible for protocols (e.g. climate, desertification, deforestation, poverty, MDG's) that can be used to bring pressure to bear on sub-regions and African countries to develop their geoinformation. This is already happening through many initiatives that are being implemented on the continent. The national Spatial Data Infrastructure (NSDI) committees also have a role to play in motivating national ministries to budget for the development of geoinformation needed to address societal problems being faced by that country.

At the workshops the importance of fundamental and core data sets must be emphasized. The ability to integrate these data sets for analysis must also be demonstrated. By using this approach it has been shown that decision-makers become more aware of the value of geoinformation and are more willing to promote its use in government. Another mechanism that can be used to make decision makers more aware of the value of geoinformation is through the National Spatial Data Infrastructure (NSDI) committees that normally have representatives from the different government ministries.

The value of the above approaches is that geoinformation practitioners can begin to effectively communicate with decision makers, especially in relation to the budgeting of funds at a ministerial level for the collection, management, analysis and dissemination of geoinformation. What was strongly emphasized is that there is the need for this to be done within an institutional framework even if there are no formal structures of this nature in place. This approach also facilitates the establishment of networks and the harmonizing of management and geoinformation infrastructure at a national and sub-regional level. What is critical in all of this is that within the sub-regions and countries of Africa an organization that will drive these processes must be identified.

What is also important is that through the awareness campaigns that implemented that a culture of using geoinformation is established. A final suggestion made by participants is that case studies be done in Africa to reflect on lessons learnt in the popularizing of geoinformation in countries and at a sub-regional level.

2.2 Lack of geoinformation infrastructure at the sub-regional level

Workshop participants raised the issue that there are imbalances in accessing geoinformation equipment in countries and in the sub-regions. The use of the geoinformation generally happens within frameworks at a national and sub-regional level (e.g. State of the Environment [Soe] reporting). It is within these frameworks that there is the need to establish partnerships and the sharing of resources. To formalize these partnerships cooperation agreements need to be signed.

It is through these sorts of approaches that the institutional capacity required to collect, manage, analyze and disseminate geoinformation can be established. An example of an area where these sorts of partnerships can and are being established is in the development of a geodetic framework for Africa and the hosting of satellite receiving and archiving stations. This is required so that cross border data sets are harmonized. Through the partnerships there can also be the harmonizing of

equipment. The partnerships can be used to create synergy in geoinformation activities undertaken at both a national and sub-regional level and enable organizations to seek funding to address common problems.

2.3 Capacity building

There is generally a lack of institutional capacity. One of the reasons for this is that funding for geoinformation is on a project-by-project basis. There is a need for national governments to set aside funding for the development of institutional capacity. Furthermore, existing institutional capacity needs to be modernized. This needs to happen at both the national and sub-regional levels.

International initiatives like the Global Mapping Project have an important role to play in the development of both individual and institutional capacity. Firstly, they provide grants for the training of individuals and the establishment of institutional capacity. Secondly, they allow geoinformation practitioners to gain experience by working on these projects even if they are at a global scale. The experience that is gained in conducting analysis at the global scale can then be applied at the national level.

Regional institutions should also be supported and strengthened. They provide regular courses on the application of geoinformation. They also develop geoinformation curricula for different academic levels.

2.4 Dissemination of geoinformation

One of the important things to do in disseminating geoinformation is to package it properly. However, there are many factors that affect the dissemination of geoinformation. This leads into the debate about the development of geoinformation in the private versus the public sectors. In the private sector the geoinformation is being developed for a client and is generally only accessible to them. In the public sector, government often restricts access to information through the promulgation of policies. Consequently, the geoinformation industry cannot package and disseminate the geoinformation because of these sorts of restrictions.

One of the ways to begin addressing the restrictions placed on the disseminating of geoinformation is to increase the demand. Demand can be generated through the use of existing geoinformation to address critical societal problems and by demonstrating its value in improving decision-making. By showing the financial benefits, more requests for geoinformation will be forthcoming from both the public and private sectors. This will place the required pressure on decision-makers to make information available for dissemination. The political impetus will then be created to ensure access to geoinformation in the long term. This approach is what has been experienced in many African countries.

The private sector is an important player in the collection, management, analysis and dissemination of geoinformation. This is because they are generally better resourced than organizations in the public sector. To harness these benefits it is important that Public-Private-Partnerships (PPPs) are established. However, this is often quite difficult because the private and public sectors follow different business models. The private sector is more business orientated while the public sector generally operates in a policy regulated environment.

Another factor that affects the dissemination of information is the lack of sharing of information and knowledge in the geoinformation industry. Mechanisms must be put in place to enable sharing to occur. One of these mechanisms is to implement

policies that facilitate the access to information. The option of charging for data must also be considered as it one way that information in the private sector can be accessed and the geoinformation industry in a country developed. Clearinghouses are also a mechanism by which information and metadata can be accessed. Clearinghouses are becoming an important means by which geoinformation can be disseminated electronically through the web.

There are many international initiatives that provide free access to geoinformation. Although these initiatives tend to provide geoinformation at a coarse scale, they are an important beginning in making geoinformation available to the countries of Africa.

2.5 Coordination

One of the main reasons that there is the need for coordination at a regional, sub-regional and national level is to ensure that there is no duplication. Another reason is that many of the geoinformation initiatives are generated by multi-national agencies situated outside of the continent and there efforts need to be streamlined to provide the geoinformation needed to address the priority issues in Africa. Africa has limited resources for the generation of the geoinformation needed for its decision-making and, therefore, they need to be used as optimally as possible.

There are several organizations that have a role to play in the coordination of geoinformation on the continent. At a regional level, the UNECA's CODI Geo Working Group is mandated to facilitate the development of sub-regional and national SDI. Participants at the workshop also emphasized that the African Organization for Cartography and Remote Sensing (AOCRS) has an important role to play. The AOCRS has recently been re-launched and has a role to play. The regional centers also have a role to play under the auspices of the UNECA and AOCRS. These organizations have largely been given the mandate by the African Union (AU), under its previous dispensation as the Organization for African Unity (OAU), to fulfill this function. Other organizations that should contribute to the coordination of geoinformation are the African Association of Remote Sensing for the Environment (AARSE) and EIS-Africa. The UNECA should conduct a study to look at the capacity of these organizations and the streamlining of their activities to meet the geoinformation objectives of Africa.

Clearinghouses can also play a role in the coordination of activities on the continent. Through the clearinghouses data and metadata can be made available. Presently, the UNECA is playing a role in holding regional workshops that provide training on data and metadata available at a regional and sub-regional level. They are also playing a role in providing the technology for sub-regions and countries to disseminate their information via the UNECA's clearinghouse. The UNECA in this role also facilitates the development of SDI at a sub-regional and national level. They are not doing this in isolation and are working with agencies such as UNEP and the regional centers. However, workshop participants emphasized that the UNECA must play a more meaningful and active role in the coordination of geoinformation in Africa. For example, it was mentioned that nothing has been done about the Working Group on Capacity Building. The UNECA emphasized that they are really at the beginning of this process.

2.6 Role of international initiatives

There are many geoinformation initiatives on the go at the moment in Africa. These include Africover by the FAO, the Global Mapping Project being implemented by the International Steering Committee for Global Mapping (ISCGM), the ICSU's

geohazards initiative and TIGER to mention but a few. Overall the participants emphasized the advantages of these initiatives. In the Africover initiative as an example, national focal point organizations worked with their international counterparts. This approach to the development of geoinformation is seen as an international best practice and could well be used as a model for the development of other geoinformation for the continent. AFRICOVER also contributed to the development of capacity and there was the transfer of software for use by countries that participated in the initiative.

The Global mapping Project is also an important initiative because it has established partnerships with the national mapping agencies of countries that have applied to form part of the project. Having established the partnership there is opportunity for the national mapping agency to have their capacity developed. Another factor about the international initiatives is that they also provide innovative new approaches and contribute to the development of the Global Spatial Data Infrastructure (GSDI).

The geohazards initiative is a new one that is being implemented by the ICSU in collaboration with the Geoscience unions in Africa. The focus of this initiative is in the development of capacity to use satellite imagery in looking at hazards on the continent. Hazards include things like volcanic eruptions, earthquakes, floods, etc. the approach that this initiative will follow in its implementation will be to encourage the participation of as many stakeholders as possible. A similar initiative is the TIGER project that looks at solving problems with water resource management in Africa.

The final point that was raised was the concern about the sustainability of these initiatives after the initial phase had been completed. It was emphasized that this is very dependent on the support that these initiatives get from sub-regions and countries in Africa as to whether they would continue or not. For example, the Africover initiative has completed its initial phase and because of requests for the work to be extended to other regions in Africa will continue into further phases.

2.7 Fundamental and core data sets

There is no acknowledged definition for fundamental data sets. However, the data sets that are considered fundamental are:

- i. Spatial reference frame (i.e. geodetic frame), which is being addressed through the AFREF but needs to be densified at a national level and updated for the entire continent.
- ii. Topographic (i.e. roads, rivers, place names, elevation, etc)
- iii. Ortho-imagery
- iv. Administrative boundaries
- v. Cadastre

What was felt to be definitive of the fundamental data sets was their coarser scale. The core or thematic data sets were felt to be at a much finer scale and should be developed within an appropriate sub-regional and national framework. These data sets include:

- i. Environment
- ii. Census or population data
- iii. Poverty and human resources
- iv. Addresses – address of beneficiaries who access services must be none. It is also a human right for people to have an address.
- v. Access to basic services (e.g. schools, health, markets, water and sanitation)

vi. Extent of development funding

3. SOME CONCLUDING REMARKS

The workshop participants were asked to make some concluding remarks. These were:

- i. There is a need for the geoinformation of Africa to be effectively disseminated;
- ii. Decision-makers must be included in regional, sub-regional and national workshops. They must also be engaged with on a regular basis. One of the problems faced is that ministers don't attend meetings that have been set up.
- iii. Short courses should be offered to decision makers at the various levels of government (i.e. national, provincial and local). The question that then arose was - who are the decision-makers that we are referring to:
 - a. Ministers, as they have to brief the presidents, cabinets and parliament
 - b. Senior beaurocrats/managers in ministries
 - c. Managers at the local authority level
- iv. Development and implementation of geoinformation curricula at different levels at a national level.
- v. There is the need for policy to use as a framework for the development and the dissemination of geoinformation.
- vi. All people who may potentially benefit from geoinformation should be informed about the use and application of geoinformation. This should be both top-down (i.e. from senior decision makers down) and bottom up (i.e. from the people up).
- vii. Geoinformation practitioners should be educated in communication and marketing. In the UNECA's guideline on SDI this chapter is still missing. An operation working group on communication should be established and they must reach all the decision makers listed above.
- viii. UNECA is a catalyst and a coordinator but they need to be empowered to fulfill this role
- ix. Focal points are a means by which the UNECA communicates with countries and sub-regions.
- x. There is a lot of duplication amongst the organizations involved in CODI-GEO (e.g. AOCRS, AARSE, regional centers) and the associations in the other component of CODI (i.e. statistics and ICT). UNECA should play a role in streamlining activities of these organizations at a regional, sub-regional and national level (e.g. NSDI, national statistical system, ICT).
- xi. There is the need for definition of terms (e.g. fundamental and core data sets) and standardization (e.g. cadastre). A study of cadastral systems in African countries should be done by a group of experts and recommendations made on the standardizing of cadastre in African countries.
- xii. Development funding is a highly politicized issue and the criteria for including it as a core data set must be defined.
- xiii. Fundamental data sets (e.g. roads) that are developed by other ministries in a country should be sent to the national mapping agency to be archived. These data sets should align with the standards set by the national mapping agency.
- xiv. The three arms of CODI should meet within countries on a regular basis. This was one of the recommendations of CODI III. UNECA should facilitate the how this happens within each country taking into consideration the sovereignty of countries and ensuring that no one component has dominance over the other.

Annex I

List of Participants on the Workshop on use of geoinformation in Development (Human Sciences Research Council) 23-24 April 2005, Large Briefing room, UNCC, Addis Ababa, Ethiopia				
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