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MEMO ON THE NEED TO BUILD AN AFRICAN REGIONAL GEOGRAPHIC DATABASE*

* Invited Paper

MEMO ON THE NEED TO BUILD AN AFRICAN REGIONAL GEOGRAPHIC DATABASE†

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EXECUTIVE SUMMARY

Reliable and timely geographic information empowers the user to better document current conditions and to monitor what is happening; to draw from past experience so as to improve on future performances, and; to establish linkages and balance between economic, environmental and social capital in order to improve upon the basis for societal response. There is availability of satellite and other geographic data in many African countries but the capacity to absorb and process the data into useful information is not there. However, in the last few decades, the world has seen major changes and advances in spatial data systems and technologies. A range of powerful technologies has been developed, technologies that can become real tools in furthering environmental and human development objectives. The full realization of their benefits require large financial investments to acquire the technologies and to develop high level skills, capitals that African countries lack.

There is a growing international sympathy for the need to give affirmative development assistance to developing countries to acquire some of these technologies and develop skills in areas that support the Rio Principles of the Earth Summit, 1992. But there cannot be realistic multilateral interventions that would reach out and empower all the 53 African countries effectively with the required capital to build individual technical capacities and for development. A better initiative would be one which develops an African Regional Geographic Database, that would in time, nurture and stimulate the growth of capacity building at national level. Such integrative approach at regional co-operation would be in the spirit of the 1980 Lagos Plan of Action and the 2000 Lome Agreement on African Union, the mechanism of which were adopted by the Organisation of African Unity.

There is an urgent need to build such a Facility (The African Regional Geographic Database) that would provide for African countries, the capacity to acquire and process spatially referenced information on topical issues such as natural resources endowment, environment, development and monitoring of natural and technological hazards. Indeed, in most African countries, the work of charting their underlying resource endowment by means of systematic surveys is just now getting underway. In so far as most African countries' economic progress is substantially associated with the location, opening up and exploitation of additional primary resources, the African Regional Geographic Database shall bring about, with rapidity, depth and constancy, the discovery of more resources and their economically effective supply.

Secondly, The African Regional Geographic Database would contribute the prerequisite spatially referenced earth information needed to undertake comparative research and analysis of the terms of the multitude of the ever-increasing international multilateral conventions and agreements. The periodic studies by expert, multi-disciplinary committees shall monitor and assess the actual

† Invited paper.

performance as opposed to the designed objectives of the multilateral agreements and conventions as they affect African economies. The studies shall propose through UN Economic Commission for Africa (UNECA) and African Union mechanisms, informed response of creative policy initiatives on trade, environment and development interface. They would articulate and design cross-sectoral reforms on the structures and terms of the multilateral conventions and agreements that must guarantee the integration of the aspirations of African countries.

But perhaps the distinguishing need for the African Regional Geographic Database shall be manifest more in the role the African Union and UNECA must play in moderating and influencing peaceful resolution of boundary conflicts amongst African states. As the most influential Africa wide institutions, African Union and UNECA must avail their executives with the tools and skills encapsulated in an up-to-date geographical information database, to enable them evolve innovative and sustainable solution to Africa's wide range of problems. The African Regional Geographic Database shall advance regional co-operation and development through capacity building in the member countries that are not immediately endowed with such technical skill base.

Global and Regional Geographic Databases are the engine room for the development of geographical indicators for all sustainable human development in the new millennium. The United Nations General Assembly at its 1997 Earth Summit+5 has confirmed their status when it accepted the Santa Barbara Statement on Global Mapping for the Implementation of Agenda 21, presented jointly by the United States and Japanese Permanent Representatives to the UN. The Statement, prepared from the Inter-regional Seminar on Global Mapping for the Implementation of Multilateral Environmental Agreements, aims at fostering international cooperation in the development of the Global Map for the Implementation of Multilateral Environmental Agreements.

By the year 2002, when the UN General Assembly meets to consider the 10 years review of the Earth Summit, many more global and regional geographic 'spatial data management' organisations would have come on-stream including the Global Spatial Data Infrastructure (GSDI), the UN Geographic Database, the Permanent Committee on GIS Infrastructure for Asia and the Pacific (PC GIAP), the Permanent Committee on Spatial Data Infrastructure for the Americas (PC-IDEA), and CORINE (Coordination of Information on the Environment) Land Cover Project. According to the UN Cartographic Section, Library and Information Division, there are four operational regional geographic databases by Dec., 2000 – already functional and integrated in to the family of those regional organisations that are hard at work making the our world a better place. Whether or not African countries and organisations participate in these global efforts, global and regional datasets shall be produced – of course leaving the African datasets inaccurate and incomplete, if by acts of commission or omission we get left behind. The African Regional Geographic Database should be operational in time for the Earth Summit +10 review meeting of the General Assembly in 2002, to give African countries and experts an additional platform upon which to contribute meaningfully to sound global resources management.

1. INTRODUCTION AND BACKGROUND INFORMATION

Colonial administrations for their own use have assembled geographic data sets on African countries from the very beginning. Since African countries started getting independence in the early 1960s both the data sets and the machinery for their assembly became heavily dependent upon Official Development Assistance (ODA). By the 1990s, when African countries needed geographic data sets for development and to buttress their arguments in the multitude of multilateral conventions on human settlements, sustainable developments and trade, the ODAs in the assembly of geographic data sets have dried up and have left behind no sustainable machineries and capacities for collection, analysis and presentation of geographic data sets. The fast changes in geographic information technology of the 1980s and 1990s, coupled with the increasing poverty of African nations, have made investments in capacity building and replacement of obsolete equipment to have low priority rating. Without accurate geographic data sets of the land and its resources, development plans and strategies would be neither adequate nor sustainable and the machinery for driving forward the overall programme would become faulty.

African countries are for the most part of severely indebted low-income economies. Furthermore, the global struggle for access to resources, the burden of providing for a steadily increasing population, the demand for informed response to progressing environmental degradation, rapid depletion of natural resource due to unbridled exploitation, adverse weather changes, instability and wars are additional internalised pressures depleting their limited financial resources. Recent multilateral conventions designed by the developed countries to promote global trade and sustainable development have imposed additional financial burden, while at the same time weakening the financial resource base of the African countries, through the continuous manipulation of debt overhang, deficit reduction, currency devaluation and trade liberalization. Such African countries have little other resources left to invest in even their own future.

In 1994, at the International Symposium on core data for environmental assessment and sustainable development strategies convened by UNEP and UNDP in Bangkok, Thailand, it was concluded that countries should place top priority on the acquisition of data on 10 core geographic data themes, as the information that need to be available to encourage environmental impact assessment and sustainable development: land use/land cover, topography, soils, infrastructure, demographics, economics, hydrology, water quality, air quality, climatology. The development of these core geographic data sets is complex and capital intensive, and beyond the immediate affordability of highly indebted, least developed African countries. Moreover, specialized UN agencies such as UNDP, IBRD and UNEP that were mandated to negotiate, fund and co-ordinate sustainable development programmes have sometimes failed to insist on integrating National Mapping Agencies (NMOs) into national structures for the core geographical data development for Multilateral Environmental Agreements, preferring instead, to get the job done, a process that has no built -in mechanism for the long term human and institutional capacity building for both public and private institutions. Transnational Companies, on the other hand, develop for their internal use and hoard the core geographical data. Having expended huge resources to acquire the core data (and legally not obliged to share), the "owners" of the data would device a variety of means to restrict the availability of, and accessibility to the data sets, thereby limiting their collateral use and currency; even as the huge costs of acquiring core geographical data sets are economic and justifiable only when they support a wide variety of uses.

Multilateral Environmental Agreements require, by definition, the core geographical data sets of more than one country to be effective. Core geographical data sets collected jointly by countries at regional or sub-regional level cost less to each country to acquire due to economies of scale. But probably even more important, the use of common reference datum, scales and methods of data gathering would ensure that common regional features are represented in form and structure as seamless, uniform and unambiguous making the data sets an effective medium of communication, conveying unimpeachable spatial relationships to all users. The data integrity guaranteed by the co-operation in its acquisition would also guarantee its wide acceptance and build confidence in its wide usage. Perhaps the logical step forward is to employ the strength encapsulated in the new and powerful Information Technology to 'network' the regional and sub-regional approaches of core geographical data sets acquisition into the African Regional Geographic Database. Such an African Regional Facility shall have as part of its mandate not only the co-ordination of the timely acquisition of the 10 geographic data themes recommended by the Symposium, but also a role as motivator and facilitator to NMOs and all stakeholders and all potential data providers in each state and sub-region to share spatial data acquired in any domain according to agreed upon open and transparent protocols.

There are many specialized organizations that are collecting globally consistent core geographic data sets of importance to African NMOs and spatial data users at country level. On the other hand the NMOs and data users have the means of gathering other types of spatial data that are particular to their local environments but which could enhance the globally consistent data and add value to it. Moreover, the active participation of the African NMOs and other stakeholders in the global and regional geographic data undertakings always assures that the data shall be shared, its integrity confirmed, reduces the duplication of efforts in collecting similar data many times, and supports wider usage of the data. As a result of the participation the international community has access to more complete data that shall produce better geographical indicators for research, new products development, and for the management and monitoring the performances of Multilateral Agreements (on environment, social and economic). A bridge can be built between the African NMOs and data providers and the international community through the establishment of the African Regional Geographic Database.

Thus, there is an urgent need for a collective forum – the African Regional Geographic Database, for capturing, storing, checking, integrating, manipulating, analysing and displaying data which are spatially referenced for African countries. The Database shall service the specific geographic information needs of the participating member countries as well as to service the regional inter-agency panels that would undertake multi-disciplinary analysis and monitoring so as to assure that the demands from boundary conflicts, the imperatives of trade liberalization and the conditionalities of sustainable development regimes, embedded in the operations of the Multilateral Conventions and Agreements, do not impose disproportionate burdens on African economies. The Database shall provide the clearinghouse nodes for the international community to acquire all African based geodata and its corresponding metadata.

1.1 Earlier Efforts

There have been many earlier initiatives in Africa to form regional organisations that were to provided leadership in evolving common policies, and strategies for the development of core geographical data sets. Perhaps the most outstanding and certainly the most successful was the United Nations Regional Cartographic Conference for Africa (UNRCCA). Formed in 1964, it has successfully facilitated the meeting of African NMOs, major academics in surveying and mapping

and experts from development partner countries, thereby creating a synergy in African mapping industry that could be hard to duplicate. The UNRCCA functions are now subsumed as a unit under the Committee for Development Information (CODI) in a 1997 restructuring of the UNECA.

Another important initiative is the EIS-Africa: A Network for the Co-operative Management of Environmental Information in Africa. It started as a World Bank and Development Partner organisation driven by the complete dearth of timely and up-to-date information to support the implementation of the National Environmental Action Plans (NEAP's) of the late 1980s and early 1990s. The original initiative was called the Programme on Environmental Information Systems (EIS) in sub-Saharan Africa. Its "... aim was to help sub-Saharan African countries create operational Environmental Information Systems which meet priority demands of resources users, planners and decisions makers for a better renewable resource management." The Programme was very successful especially in the area of creating awareness for the need to create the mechanism to process the available environmental data into usable information, but even after 10 years of extended agenda, has only dented the various un-met needs of the African region. The programme has now moved from its informal donor driven organisation and registered in the Republic of South Africa as a Pan-African Non Governmental Organisation (NGO), with a vision of being "... an African society where high quality environmental information is readily available and accessible to policy and decision makers at all levels in support of sustainable development"

There have been many other major efforts of recent including AFRICOVER Project initiated by FAO, the South African National Spatial Information Framework (NSIF) Directorate, the Food and Security Programme / Regional Remote Sensing unit of Southern African Development Community (SADC) that have initiated programs that could generate regionally consistent core geographic data sets. Many of these are probably more national and sub regional in their reach. Some of them have already converged in their efforts towards the search for a more regionally encompassing multi-disciplinary African Spatial Data Infrastructure, similar in structure to the African Regional Geographic Database described in this memo.

1.2 The Santa Barbara Statement

Two recent initiatives that have become effective in fostering international co-operation in the production of consistent global and regional core geographical data are simply the International Steering Committee on Global Mapping (ISCGM) and Global Spatial Data Infrastructure (GSDI). In 1996 the ISCGM convened the Inter-Regional Seminar on Global Mapping for the Implementation of Multinational Environmental Agreements in Santa Barbara California. The seminar produced the now famous Santa Barbara Statement, which for its import and impact as the precursor for the international co-operation in the production of globally and regionally consistent 'global map' at a scale of 1:1,000,000 by the year 2000, is reproduced:

i. A Global Mapping Forum must be created bringing data users and providers together to facilitate the creation of GSDI. A variety of national, regional and international organisations, NMOs, private sector companies, academia, NMOs, and space agencies, as well as other relevant organisations must be involved in this effort. ISCGM should undertake a study to create such a Forum and determine the responsibilities necessary such as periodic assessment of progress, the harmonization of standards, and mechanisms for the establishment of global mapping network. Such a network would be connected to the Internet and/or other means of communications.

ii. Agencies implementing Agenda 21 accords should precisely define their spatial data and information requirements for implementation, compliance, and monitoring with the assistance of expert groups (eg ISCGM). These requirements should be included as priorities.

iii. Financial and other incentives for project partnership within the GSDI should be devised to facilitate the participation of national institutions of developing countries and economies in transition.

iv. Donor agencies and development banks should increase assistance to institutions in developing countries and economies in transition to improve the quality of spatial data products and services, and facilitates access to these data for creation of regional and global map products.

v. Issues related to spatial data policy and access must be discussed under the UN Cartographic Conference.

vi. Overall Global Map development should be fostered under the umbrella of the United Nations and should recognise initiatives being taken at national, regional and global levels.

vii. UN Environment Programme's Global Resource Information Database (UNEP/GRID) and other UN programmes directly involved in GSDI activities should be strengthened to provide necessary technical support systems and metadata services to UN agencies and member countries

viii. Complementary effort for the provision of technical support by a variety of national, regional and international organisations should be encouraged and coordinated in strengthening GSDI activities.

ix. These recommendations should be embodied in a report to be presented to the Special Session of the United Nations General Assembly on the Implementation of Agenda 21 in 1997. This report will make a clear and practical proposal for implementation developed under the auspices of UN DDSMS with the assistance of the ISCGM.

2. JUSTIFICATION FOR THE DATABASE

Accurate up-to-date maps and geographical data sets on any theme, at any scale about Africa and its 53 states, needed in support of wide variety of studies, do not exist in the NMOs. Accurate mapping and geographical data set development are high technology based and skill labour intensive, and do not come cheap. Core geographical data of African countries are usually produced by their National Mapping Organisations (NMOs). However there has been a gradual collapse in the capacities of the NMOs in the last 40 years of independence, due to consistent poor funding and low investments to the extent that they have been unable to play proactive roles even in defining, setting up and implementing national guidelines for collecting, processing, and disseminating core geographical data, including different cartographic and thematic maps. Moreover the application of electronic and information technologies in the last 20 years, has revolutionized production methods for core geographic data sets to the extent of replacing antiquated and obsolete analogue technologies, enabling the complete re-engineering of the mapping process and systems. This

revolution has not happened in African NMOs. A 1996 survey carried out by the United Nations Regional Cartographic Conference for Africa (UNRCCA-UNECA) covering African countries' NMOs, on the extent and currency of mapping, stock of survey and mapping equipment, and the level of technical training of the NMOs personnel has revealed startling and distressing information:

i. Only a few African countries have map coverage at 1:1,000,000, 1:250,000 and 1:50,000 regional scales. Most of the map series completed have not been up-dated in 30 to 40 years;

ii. The bulk of African countries equipment stock are analogue and obsolete; and,

iii. The majority of technical personnel have training and experience only in analogue methods.

The critical importance of spatially referenced data for characterization and targeting of priorities and policy intervention has been recognized the world over. For example, the publication of the report of the Lord Chorley Committee on Handling Geographic Information in 1987 represented a milestone in the development of thinking about geographic information management in the United Kingdom. All OECD countries have since then developed similar institutional framework for handling geographic information. One of these initiatives, the US National Spatial Data Infrastructure was promulgated by Executive Order No. 12906-1994 as '*... the means to assemble geographic information that describes the arrangement and attributes of features and phenomenon on the Earth. The infrastructure includes the materials, technology and people necessary to acquire, process, store and distribute such information to meet a wide variety of needs*". Furthermore, on all the other continents, there are regional and global initiatives on geographical information: the European Organisation on Geographic Information (EUROGI); the Permanent Committee on GIS Infrastructure for Asia and the Pacific (PCGIAP); the International Steering Committee for Global Mapping and; Global Spatial Data Infrastructure Group (GSDI), moving inexorably towards a more effective use of spatial data. Africa needs to set in motion, an initiative to bring it into parity and equity in this area.

Spatial data are expensive to generate, maintain and integrate with other data. In fiscal 1994, about US$4.4 billion was spent on Federal spatial data activities in the United States of America; state and local governments spent an equal or greater amount. In that same year, the World Bank gave out more than US$2.4 billion towards environmental support projects in developing nations. Most African countries cannot match such financial prowess and have been left out almost entirely. Moreover, because of drastic changes in technologies from analogue to digital mapping, which took place in a relatively short period of time, the ability to understand and use these new technologies effectively, particularly in African countries, has not advanced as rapidly as the technologies. African countries still have analogue instruments and personnel trained for analogue mapping technologies. New instruments are expensive; conversion of paper maps to digital products is labour skill extensive and thus expensive; and capacity to re-train old personnel is limited. In addition, the enabling environment of the new technology, in the form of extensive communication infrastructure and Internet connectivity are, in most African countries, fledgling. All these limiting factors reinforce the need for Africa to pool its limited resources by creating one Regional Geographic Database, from which future national spatial data organisations could be nurtured.

The transformation from the existing graphical maps and geographic data set of most African countries to a new digital geographic information database system requires the mobilization of funds which could be used to secure computer hardware and software, and other capital which the

new technology demands. It requires additional costs to purchase new data, convert old data, analyse, integrate and structure the data such as to submit it to the new technology discipline. It requires, furthermore, a group of men and women who have the technical expertise and foresight not only to conduct the multi-disciplinary studies needed but also to devise ways of bringing technology, enterprise and resourcefulness together in a functioning operation. These transformation elements are in severely short supply in African countries, to the extent that it makes more economic and practical sense to establish one functioning system that would service the needs of participating member states.

2.1 The Boundary Issues

Only recently, Ethiopia and Eritrea fought a very savage war over disagreements as to the position of their common boundary. Lives and properties were needlessly lost. Similarly, the boundary between Nigeria and Cameroon at Bakassi Peninsula has seen many clashes and is currently before the International Court of Justice (ICJ), The Hague for adjudication. Most African boundaries have been artificially delimited and described by colonial governments for colonial purposes. Independent governments have inherited the boundaries with all their imperfections. OAU has through the 1964 Cairo Declaration, endorsed the integrity of the inherited boundaries. Since then, however neither the African Union nor any of the contiguous African countries have made concerted efforts to demarcate and actualise the inherited boundaries. Moreover, newer pressures have been added to boundary resolution for countries with maritime boundaries, through the coming into force of international agreements such as the United Nations Conventions on the Laws of the Seas (UNCLOS). As other linked variables from economic factors, to cross border population, defence and security, navigation and commerce, become prominent, many more flash points shall spring up and regional organisations would be called upon to intervene and settle disputes between member countries.

Resolution of boundary dispute between independent African countries is at the best of times an untidy bilateral affair. The National Boundary Commission of each country relies solely on data sets from its own national database – information that is invariably incomplete, ambiguous, and out of date and not in harmony with the neighbouring country's data set. Invariably the boundary disputes easily escalate into conflicts engulfing the sub-region, usually requiring regional and international intervention. In anticipation of the onerous tasks of preventive diplomacy and post conflict reconciliation and reconstruction, it is necessary to establish a reservoir of core geographic data sets - the African Regional Geographic Database, containing unimpeachable boundary demarcation data sets, collected and verified through joint regional co-operation, and which can be sanctioned by the African Union and UNECA mechanisms. The Database should comprise of all available data on all the African boundaries that shall be sourced from all available nodes the world over, including new mapping using satellite imagery and Global Positioning System (GPS) technologies.

2.2 Natural Disaster and Technology Hazards

Northern Kenya, Southern Sudan and most of the countries on the horn of Africa are undergoing persistent drought. There is frequent crop failure and food shortage that lead to famine and starvation. Mozambique has only recently been swamped by widespread flood with large-scale loss of property, risk to life and social disruption. African coasts and territorial waters are continuously threatened with pollution from illegally dumped hazardous wastes and oil spills. All African

countries are risk prone to natural disasters and technological hazards. Most of these hazards span several countries and require co-ordinated regional solutions, in addition to the individual national efforts. ***And yet, there is limited regional capacity in place for monitoring and predicting the occurrence of these twin evils and developing socially significant, environmentally relevant, emergencies and disasters management and early warning Database.*** Accurate forecast information on crop production is no longer a dream of remote sensing experts. The forecasting approach utilises meteorological and agricultural information derived from satellite imagery and crop growth model. Studies of information from meteorological and Earth resource satellites have transformed the accuracy of weather forecasts, revolutionized pollution monitoring and oceanography and coastal zone management, and has made routine environmental audits and the monitoring of environmental change possible.

Major studies on natural disasters and technology hazards have long tradition in geography. The collection and geo-coding of historical data on natural disasters is important since it is clear that their spatial pattern varies through time. Many areas that appear hazard free on available maps may merely be passing through a temporary period of quiescence. An Africa wide and regional geographic information database shall provide the forum for a wide range of disaster modelling and monitoring. Only such comprehensive emergency planning and management could include elimination or reduction of risks, early detection of disasters and hazards to enable early warning of those likely to be affected, and informed and orderly response, including search and rescue. Obviously, African states cannot eradicate natural disasters and their savage impacts. However, it is possible to, through satellite surveillance within the context of a geographic information database (topography, soil, weather data), predict with regularity, such phenomenon as anticipated crop yield, potential droughts and floods, their extent and catchments areas. Such decision support information shall give African states, the early warning needed to respond effectively. African Union and the ECA, as the continent's voice for social justice, should take a proactive leadership in this field too; it should not be enough to be lead by the nose by international NGOs.

2.3 Monitoring the Performance of Multilateral Agreements and Conventions

In 1992 the UN Conference on Environment and Development – the Earth Summit – took place in Rio de Janeiro. At the Summit, G77 countries signed up to a variety of action plans for addressing global environmental issues, whilst OECD countries agreed to increase development assistance as a quid pro quo. By 1994 another global Conference, the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) was concluded, extending multilateral trade rules to most facets of international commerce and establishing the watchdog World Trade Organisation (WTO). Further commitments were made at the Habitat II Conference in Istanbul and at other international conferences and conventions. ***In all cases there were lack of follow through on commitments made by OECD countries of new and additional financial resources and technical assistance to assist in mitigating the development burdens imposed on G77 Countries.*** In fact, the actual volume of ODA flow has decreased in the 8 years since Rio. Furthermore, trade liberalization and other GATT/WTO enforced conditionalities have impoverished African economies. The advantages of technical progress are being used up in the OECD countries of the North, and the burdens and risks are being passed on to the African countries. African countries, individually, have neither competence nor expertise to monitor global compliance of these agreements nor the muscle to ensure transparency and openness in the implementation of the terms of the global agreements.

However, collectively African countries could have a better chance. Through the use of the African Regional Geographic Database, expert panels would be capable of undertaking the multi-

disciplinary analysis to work out how the burden of adjusting to the demands of global commerce, sustainable environmental exploitation and development should not fall disproportionately on African countries. The Database would maintain geographic information and attribute database at continental and sub-regional levels on urbanization and human settlement, environment, minerals and extractive resources, trade and sustainable development, fresh water, forestry, desertification etc., and the analytical and methodological framework pre-requisite for modelling specific sectoral objectives of the Multilateral Agreements and Conventions. It would conduct a survey of the status and currency of baseline core data that are geographically specific, for spatial referencing and bring such data into a warehouse. The African Regional Geographic Database shall furnish through the African Union and the ECA structures, to African countries and other institutions, the factual and analytic foundation, particularly addressing policy intervention failures, for the reforms that are necessary to integrate sustainable policy objectives mix, of global trade, environment and development. This will strengthen the countries' negotiation capacities and sharpen their ability for effective participation in on going and new Multilateral Environmental and Trade Agreements. ***Only such exercise of their rights and meeting their obligations could guarantee the further integration of Africa countries into the international community economic systems.***

2.3 Similar Regional Databases on Other Continents

There is a steady convergence of technologies that allows for efficient processing and database interaction over wide regional areas and even the entire globe. Many regions have already created regional initiatives, similar to the one proposed in the memo aimed at developing regional core geographical data sets and information, and making them widely available to support Multilateral Environmental Agreements and sustainable development. The most recent ones include:

i. The Permanent Committee on GIS infrastructure for Asia and the Pacific (PCGIAP). Born out of the UN Regional Cartographic Conference for Asia and the Pacific meeting on the formation of PCGIAP held in Kuala Lumpur, 1995 and the Experts Group on Cadastral Surveying at Boger, 1996. The PCGIAP is hard at work to evolve the Asia Pacific Spatial Data Infrastructure (APSDI);

ii. The Permanent Committee on Spatial Data Infrastructure for the Americas (PC-IDEA). Born out of the resolution of the 6th UN Regional Cartographic Conference for the Americas (UNRCC – New York, 1997), the PC-IDEA was midwifed by the International Seminar on National Spatial Data Infrastructure and the Workshop on Geographic Metadata in Bogotá, with the active support of a World Bank Assisted Programme; the US Federal Geographic Data Committee and the Pan American Institute for Geography and History. PC-IDEA is concluding the establishment of regional level infrastructure, which will serve the Americas; and

iii. The two major regional databases in Europe: the Multipurpose European Ground Related Information Network (MEGRIN) and The two major regional databases in Europe: the Multipurpose European Ground Related Information Network (MEGRIN) and CORINE (Coordination of Information on the Environment), an European Union initiative created in 1985 as an European Environmental Agency Geographic Database covering European Union and its neighbours. Its Database pronounces the development and maintenance of core datasets on land use, transport infrastructure and administrative boundaries.

iv. The Cartographic Section, Library and Information Division, Department of Public information in collaboration with the Department of Political Affairs and the Department of Peace keeping Operations, is developing The UN Geographical Database. Its programme development phase, which will produce a pilot database, was projected to be completed by September 2010. It shall service the entire UN systems and in time will include some of the requirements of developing countries. The UN Geographical Database will integrate data contributed through international cooperation in a way similar to that of ISGM.

2.4 Global Database Facilities

At the global level there are various initiatives such as the *Committee on the Earth Observation Satellites (CEOS), Global Mapping Task Team, Earthmap, UNEP/GRID, Global Demography Project*, and others. These are initiatives that are developing globally consistent core geographical data sets including the territories of African countries but in which there are no inputs from African NMOs, even if at the level of ascertaining the geometric fidelity of the acquired data. The difficulty lies not so much in any attempts by the international community to deny the NMOs access to the data but more in the inability of the NMOs to muster the technical capacity and financial resources to participate meaningfully. Further examples illustrate the situation by illuminating the underlying resource problems:

i. *The UN conference on the standardization of Geographic Names and The UN Group of Experts on Geographical Names* was established by ECOSOC to co-ordinate work for standardizing geographical names so as to support such activities as commerce, regional planning, tourism, preservation of cultural heritage etc, and to strengthen the synergy between databases affecting social, economic and environmental capitals. Except for a handful of countries, African countries do not participate in the work of this very important Committee and Expert Group. Most African countries have not established the necessary national structures and mechanism that would follow-up on the decisions of the Committee and Expert Group.

ii. *The Japanese Government initiated The International Steering Committee on Global Mapping* in 1996, as part of its contribution towards the achievement of the goals of Agenda 21. The ISCGM has since then become a global success with its work on the compilation of digital global map at 1:1,000,000 by the year 2000. All the African NMOs were invited to participate in the global mapping programme, and many have indicated their willingness to participate. But sourcing the funding and the technical assistance that would enable the NMOs to shoulder the responsibilities encapsulated in their membership of the Global Mapping Programme has proved a Herculean task. At the 1997 Earth + 5 UN summit, a resolution on ISCGM was presented jointly by the US and Japanese permanent delegation to the UN.

2.5 Principal Objectives Of The African Regional Geographic Database

The African Regional Geographic Database shall lead African stakeholders in the development of the African Geospatial Data Infrastructure. It shall:

i. Develop intra-regional policy, institutional framework and administrative arrangements that provide mechanisms for sharing experience, technology transfer and coordination of the development of the core geographical datasets;

ii. Create, maintain and develop common technical and data standards including common geodetic reference frames, data models, data quality, metadata and exchange standards, feature codes, data formats and other protocols

iii. Become the clearinghouse for global, regional and national data sets using appropriate metadata; and develop policy framework for accessing data custody, distribution, confidentiality, copyright and royalty structure by member states and other users;

iv. Assist member states to develop their National Topographic Database and National Geospatial Data Infrastructure based on harmonized geodetic framework;

v. Strengthen the regional mechanisms for technical co-operation and promote partnership for development to support policies, standards and procedure for the collection, production, archiving and dissemination of spatial data between African NMOs, ECA committees and organisations, universities, international bodies, African Unity permanent working committees, Inter-Agency committees on geomatics, at regional level;

vi. Stimulate, promote and co-ordinate African countries' participation in international initiatives on the development of regional and global spatial data infrastructure:

- ISO Technical Committee on geomatics standards;
- Open GIS Consortium;
- UN Geographical names;
- International Steering Committee for Global Mapping;
- Global Spatial Data Infrastructure Group;
- Other international arrangements.

2.6 Other Objectives of the Database

Other major objectives of the African Regional Geographic Database should include the revitalization, reorientation and consolidation of the weak national institutional capacities and machinery in African countries, in the development and maintenance of geographical data sets. Specifically the Database should:

i. Develop recommendations on meeting the needs of African countries for technical and financial assistance in the design, utilization and response to trade measures and technical regulations, and in facilitating mechanisms related to transfer of technology;

ii. Co-operate with and support the good work being carried out by the Geoinformation Unit of UNECA and the Geoinformation subcommittee of CODI;

iii. Strengthen and expand the capacities for training being offered by existing ECA supported regional efforts viz:

a. Regional Centre for Training in Aerospace Surveys (RECTAS) based on Nigeria;

b. Regional Remote Sensing Centre (CRTO) in Burkina Faso;

c. African Organisation for Cartography and Remote Sensing (AOCRS) in Algeria;

d. Regional Centre for Mapping of Resources for Development in Kenya; and

e. African Centre for Meteorological Applications and Development (ACMAD) based in Niger.

More such regional centres have to be opened in Southern and Central Africa. Africa's development partners, having known the need to increase capacity as a matter of urgency, must be encouraged to support this unique form of technology transfer.

iv. Develop capacity building at senior management levels of African NMOs and similar organisations; Universities and research organisations through:

a. Regional Executive Seminars, Workshops, technical meetings and work attachments.

b. Short and medium term training in geographical information systems, focussing on operations, development of methodologies and mechanisms for extending regional co-operation.

v. Explore and recommend on potential cross-sectoral mechanisms that would provide regular long-term support for the Database.

3. MEMBERSHIPS AND STRUCTURE OF THE DATABASE

3.1 Membership

The African Regional Geographic Database should consist of all the African NMOs and major suppliers and users of core geographical data at national levels. The membership should also include the geo-spatial Departments of Transnational Companies, major NGOs active in the environmental, habitat and other fields, institutions of higher learning providing degree and graduate courses in cognate fields.

African Regional Geographic Database

- Management Board.
- All Heads of NMO.
- Selected Representatives of Transnational Companies.
- UNECA and African Union Representatives.
- NGOs in the environment field with regional outreach.
- Major users of Data.

Advisors

- ISCGM
- GSDI
- ITC Enschede and similar institutions that have appreciable capacity building programmes for African countries
- UNGD
- Representatives of Development Partners
- Selected African Experts
- Selected International Experts

Accredited Observers

- All Regional Centres of Excellence
- International Professional Bodies and Associations
- Major data providers
- Major data users.
- Institutions Conducting Research in GIS
- International Firms Managing Satellite Data Acquisition and Distribution
- International Firms in GIS software Development and Marketing
- International Survey and Mapping Equipment, Computer and IT hardware manufacturers

Sub-Regional Committee

- NMOs in the Sub-Region
- Major Data providers in the Sub-Region
- Major Data users in the Sub-Region
- Major NMOs in the Sub-Region
- Management Experts in the sub-Regional Database

Accredited Observers

- Centres of Excellence in the Sub-Region
- Representatives of Professional Bodies and Associations
- Experts from the Regional Database
- UN Agencies and Programmes operating in the area

National Committees

To be set up by individual countries, and structured to cover all stakeholders.

Observers:

- Representatives of Regional Committee
- Representatives of Sub-Regional Committee
- UN programmes and Agencies operating in that Country
- International Experts from development partners and strategic allies
- Any person invited by the National Committee

3.1 Strategic Alliances

The Database shall reach out to develop strategic alliances with international organisations that have capacities of nationally (African countries), regionally or globally consistent core data, that could assist the Database in developing its objectives or that could help out in capacity building. Several organisations already stand out and only a few shall be mentioned:

i. ITC – Enschede and similar institutions that have appreciable capacity building programmes for African countries

ii. International Steering Committee on Global Mapping (ISCGM)

iii. Global Spatial Data Infrastructure

iv. The UN Geographic Database

v. Open GIS Consortium

vi. The NMOs that have data on African Countries

- United Kingdom
- France
- Germany

- Japan
- The Netherlands
- USA
- Canada
- Russia
- India

3.2 Co-operation

The African Regional Geographic Database shall co-operate, learn from, integrate the existing data of,and wherever possible subsume the earlier efforts made at creating regional databases that have potential for developing geographic indicators. These include but are not limited to:

i. The UNECA Committees on Human Development and Civil Society, Industry and Private Sector Development, Natural Resources and Science and Technology, Regional Co-operation and Integration, and Women Development;

ii. Environmental Information Systems – EIS Africa; and

iii. The South African National Spatial Information Framework (NSIF) Directorate.

3.3 Structure

The Database can be structured such that it is distributed throughout the continent to take advantage of existing UNECA's sub regional Development Centres (SRDCS) structure. For example, with the Database Headquartered in Ethiopia, there can be data centres in Tangiers (North African Sub regional Development Centre), Niamey (West African Sub regional Development Centre), Yaounde (Central African Sub regional Development Centre), Lusaka (Southern African Sub regional Development Centre) and Kampala (East African Sub regional Development Centre) such that all the regional groupings have at least a node. The capacity building and training unit could be centred in Kenya, Algeria, Nigeria, Niger and Burkina Faso to strengthen the UNECA supported regional training facilities already located there. Other training/data centre nodes placed in Libya, Ghana, Zimbabwe, Gabon, Botswana and Tanzania could follow later to ensure even regional spread. The distributed database would be linked electronically and coordinated.

3.4 Data Collection and Custody

Most core data sets shall be acquired and maintained at the local and national government levels, the private sector and other stakeholders. Such data shall be in the custody of the NMOs, maintained according to the specifications, and made available and accessible to the sub regional data centres. Core data sets on regional features such as international boundaries and trans-national rivers, shall be acquired at sub regional efforts and shall be jointly maintained by the NMOs and the Database. Wherever possible, copies of all core datas ets in a country shall reside in the county's NMO.

3.5 Core Data Integration

In the beginning, all core data integration shall be undertaken by the Facility, as well as the development of region wide geodetic framework, technical data and other spatial data infrastructure. As more National (country wide) Spatial Data Infrastructures are developed, cooperative arrangements shall be executed to devolve more data integration to NMOs. The African Regional Geographic Database shall integrate NMOs core data with other Regional and Global efforts to enhance global geographical data dissemination.

3.6 Data Distribution

The clearinghouse network allows for data to be distributed widely in accordance with agreed upon principles. The Database shall distribute data at global and regional levels while encouraging NMOs to develop wide national and private sector usage. The African Regional Geographic Database shall ensure that core data are available internationally for research, managing multilateral agreements and for value addition by Entrepreneurs.

The data from NMOs and other African data providers shall be opened up, harmonized and described by metadata. The African Regional Geographic Database clearinghouse servers shall carry corresponding metadata for all available national level and regionally consistent data. It shall be a one-stop data access Database; capable of arranging data accuracy validation and ground truthing. It shall also carry the Africa based core data residing in the databases of the strategic allies.

3.7 Confidentiality

Many African NMOs (and their governments) still consider maps and many core geographical data sets as classified security items. It is necessary that much of the datasets be declassified and brought into the African Regional Geographic Database umbrella. It is possible to alleviate the concerns of governments through confidentiality mechanisms, enlightenment campaigns and the distributive networking arrangements in which most of the NMOs data may never physically leave the NMO premises. Many a times, all that may be required is for the NMOs to use their data for accuracy validation and local ground truthing of independently acquired data sets and to fill in the gaps. The African Regional Geographic Database with NMOs as members shall be more effective in persuading those NMOs to honour their undertakings

3.8 Political Will

There have been many resolutions made voluntarily by African governments at various international fora on the development of geographical data sets, for example the ECOSOC decision on Geographical Names, the various Earth Summit section 10 - commitments on information for decision-making, and the various CODI (and UNRCCA before it) resolutions on African Spatial Data Infrastructure. Most African governments are not refusing to implement the decisions but invariably fail to make progress due to the lack of follow-ups on the financial resource allocation to implementing agencies. The African Regional Geographic Database would have to work hard to ameliorating this biggest of all constraint to its success.

3.9 The Way Forward

Whenever the decision is made to actualise the African Regional Geographic Database, the mechanisms for its immediate take off should be simultaneously created. A Working Group similar to that of the UN Geographic Database with similar mandate should be formed. This Working Group shall among other programmes:

i. Identify and form strategic alliances with potential technical partners and advisors (ISCGM, GSDI, UNGD, PC-GIAP, PC-IDEA, major European and American NMOs, Satellite Imagery provider companies, major GIS Software firms, NGOs, Professional Bodies and Associations etc). By virtue of being a Regional Geographic Database that includes NMOs, the Facility could have membership or observer status on many of the global and regional bodies.

ii. Organise seminars and workshops on sub-regional levels to sensitise stakeholders on the African Regional Geographic Database. The Seminars on Spatial Data and Handling organised for the CODI 1 meeting is a good starting point. The Working Group should try to, however possible, in conducting the workshops and seminars, use a good mixture of African experts in the sub-region (such as the EIS-AFRICA NETWORK, the ECA Centre of Excellence, Universities, Practitioners etc) with resource experts from the strategic allies. In each of the workshops and seminars, conclusions and resolutions should be made for ease of follow-ups within the sub-regions. The forums should be used to survey the existing and form of geodata available with stakeholders. The survey should include extent and coverage of data. Participating organisations should be encouraged to continue within their national domains.

iii. To design, phase out implementation and cost the various phases with timetable for the full implementation of the African Regional Geographic Database, so as to enable well-articulated proposals to be tabled before CODI or any of its delegated subcommittee. It is hoped that a well discussed Database proposal with defined programmes, shall be one of the many important, eloquently packaged items that the African countries shall table before the Special Summit of the UN General Assembly that shall review the progress made on Earth Summit +10, in June, 2002.

4. FUNDING THE DATABASE

The UN Secretary-General stated about Africa, in his year 2000 Report that "A review conducted by the Working Group (General Assembly ad-hoc on Africa) reveals that major obstacles to progress (in Africa) remain-lack of political will, weak governance in a number of countries, armed conflict, difficulty in mobilising financial resources, lack of adequate human resource capacity ... the inappropriate structure of some economies, and limited access to technology." The picture accurately painted by the UN Working Group could not possibly support meaningful investment in NMOs and other stakeholders to facilitate the development of quality geographic core data. African countries, as represented by their NMOs do not have the capacities, both technical and financial, to produce these core data sets. Given the current climate where ODA and Technical Assistance have shrunk continuously since the Earth Summit, it would be injudicious to suggest that all African NMOs be assisted. And yet, consistent geographic core data must play an indispensable role in achieving environmental and human development objectives, and in the monitoring of Multilateral Environmental Agreements. African countries must join hands with development partners to empower the entire African NMOs to develop capacities by creating one African Regional

Geographic Database, as articulated in the memo, with one of its cardinal mandates being to co-ordinate the rejuvenation of African NMOs.

4.1 Funding the Take Off of the Program Development Phase

The African Regional Geographic Database would be a new entrant into the family of the global and regional database group. There is an element of sharing not only the core geographical datasets and their products but also underpinning the co-operation is the embedded desire to share experiences. While designing the technical plan, it is important to draw and learn from the accumulated expertise of the strategic partners in organisational development, systems architecture, data inventory and survey, and any other technical details that could make the program development phase cheaper and less time consuming.

To set-up and fund the program of the African Regional Geographic Database, there is need to be ingenious in articulating a programme that can be supported through existing bilateral donor mechanisms. The needs by African countries and the world at large for better, more relevant and more accessible geographic information at regional and continental levels must be paid for. You may recall that in 1997, at the 19th special session, the UN General Assembly adopted the Programme for the Further Implementation of Agenda 21 – the Earth Summit +5 report. Paragraph 112 say that "*.... **a supportive environment needs to be established to enhance national capacities and capabilities for information collection, processing and dissemination, especially in developing countries, to facilitate public access to information on global environment through appropriate means ...***". It is now 4 years since the Earth Summit +5 and very little follow through on the undertakings have materialized for African countries. However, African countries have not, either individually or collectively, presented a well-articulated, visionary programme that can be supported.

You may also recall the Santa Barbara Statement to the effect that ' Donor agencies and development banks should **increase assistance to institutions in developing countries** and economies in transition to improve the quality of spatial data products and services, and facilitates access to these data for creation of regional and global map products. ... Financial and other incentives for project partnership within the GSDI should be devised to facilitate the participation of **national institutions of developing countries** and economies in transition. In order for the Database to take off, it is necessary to articulate the programme that can find funding from:

(a) ***Financial Assistance*** from the UN Commission on Sustainable Development (CSD) where mechanisms and arrangement for such co-operation should be readily available under Agenda 21 and Earth + 5 programmes. Other UN system mechanisms should also be approached:

- International Development Association (IDA);
- African Development Fund (ADF);
- UN New Agenda for the Development of Africa (UN-NADAF);
- Global Environmental Facility (GEF) funded by the World Bank, UNEP and UNDP;
- UNEP, FAO, World Bank, UNDP, UNCTAD and IFAD;

This can be achieved through direct lobby and at the pledging session of the UN General Assembly to "UNTFAD Specific" where pledges would be made specifically for the take off of the African Regional Geographic Database.

(b) ***Technical grants*** from the Multi-Lateral Development Banks. Mechanisms set up to harness information, for better resource the African Development Bank, and the Breton Wood institutions would support management.

(c) ***Technical Assistance*** on behalf of the Database from European Union and many progressive OECD countries such as The Netherlands, Sweden, France, Spain, Canada, Japan and Germany. There may be need to set up technical cooperation with institutions in those states, such as International Centre for Training in Aerospace Sciences ITC, Enschede – The Netherlands, which for the last 40 years, has been impacting on capacity building the world over. Japan has only recently, at the G7 meeting in Okinawa, pledged US$15 billion in computer hardware for such programme.

(d) ***African countries:*** There may be need to solicit for take off resource from some member states. The Database incorporates the objectives of the integration process recently adopted in Lome. Some African countries such as Nigeria, Libya, South Africa, Uganda, Ghana, Cote d'Ivory, Egypt, Algeria and many others would easily see the enormous benefit The Database would endow to Africa. They can be counted upon to assist generously during pledging sessions.

4.2 Long Term Funding

The long-term sustainability of the programme shall lie solely on its own ability to produce and market many themes of spatially referenced data. None of the global, regional or national databases could possibly recover all the cost of the data development. However it is possible to recover enough of the cost to pay for the recurrent cost of the system without making the cost of the datasets prohibitive. The Database can:

i. Commercialise some data themes to recover costs of production and research.

ii. Charge fees for technical services to member states (for boundary maps, resource mapping and charting).

iii. Charge membership costs on participating countries and organisations.

iv. Procure from Development Partners, long-term sponsorship of particular events such as Capacity Building; maintenance and expansion of Spatial Data Infrastructure; and Research.

5. CONCLUSION

This memo sets out the vision of a Facility, the African Regional Geographic Database, and the uses to be derived from it that is required to support activities undertaken by African nations at national and regional levels, to achieve their common economic and social objectives. The memo also suggests the need for African countries to co-operate to build one Database immediately, from which to spew off in the future, more national units: spatial data are expensive to generate, maintain

and integrate with other data; the change of mapping technology requires the re-equipping and retraining of African countries' stock of instruments and personnel, an undertaking currently beyond the means of individual African countries.

According to the Director UN Statistics Division of the Department of Economics and Social Affairs, "The mandate for the development of Global (and by implication national and regional) map products are clearly spelled out in the document adopted at the Special Session of the United Nations General Assembly on the status of Agenda 21 in June 1997... The Global (national and regional) map product itself, and the products that may be derived from it will be of value to decision makers as they seek to assess the status of on to monitor environmental conditions. It will also contribute to the establishment of conditions that will lead towards sustainable improvement in Global environmental conditions..." In the context of the African region, the use of the products of Global (national and regional) geographical database goes beyond the environmental issues. There is need for regional indicators of spatial nature for example, to track the effects of refugees, and internally displaced people on food production and security in the non combat zones adjoining combat areas; to anticipate and monitor the unmet needs of sheltering the teaming populace in the emerging Megapolis and Metropolis on our continent; or to simply record the disaggregated achievements made in child immunisation, education or employment. The uses of spatial indicators in all fields of social, economic and environment are limitless. All these and many more themes in any human endeavour within the African region can be modelled using geographical indicators and datasets from the African Regional Geographic Database.

The Database shall catalyse the development of national geospatial data infrastructures through capacity building, and through the co-ordination of regional efforts for the development of institutional frameworks, data standards, and clearinghouse and on metadata. It shall provide for each participating country, the factual scientific spatial data and the analytical framework to study Multilateral Environmental and Trade Agreements themes and ensure that each country has exercised its rights and met its obligations. It shall foster peaceful co-existence between African countries by providing African Union and ECA with the wherewithal to intervene effectively to manage boundary issues between member states. It shall provide to the international community, the relevant spatial data to model regional and global environmental themes and to monitor natural and technological hazards.

6. PRAYER

It is our prayer to the distinguished CODI members to:

Bear in mind that reliable and timely geographic information empowers states to take sound decisions on sustainable developments and trade, and promotes harmony between states;

Note that accurate up-to-date maps and spatially referenced data sets about Africa and its 53 States, needed to support sustainable development, do not exist;

Note further that most African countries have weak institutional capacity to acquire, process, store and distribute information and an even weaker capacity in technical personnel and the investment capital needed to take advantage of new technology;

Observe that it would be unwieldy for all 53 nations to seek ODA and technical assistance to simultaneously develop their individual national data set. It is more practical for development

partners, and more useful for African countries to have one holistic regional Database that would later on, strengthen individual national structures;

Recall that the June 1997 Special Summit of the UN General Assembly on the 5 years review of the progress made since the Rio Earth Summit has recommended the establishment of supportive environment ' ... to enhance national capacities and capabilities for information collection, processing and dissemination, especially in developing countries...' and that only the African Region is yet to implement the recommendation to set up a mechanism that would evolve its own Regional Geographic Database;

Further Recall that the 1990 Lagos Plan of Action and the 2000 Lome African Union agreements have provided the necessary instrument for the establishment of such a regional integration mechanism like the African Regional Geographic Database;

Pass a Resolution establishing the African Regional Geographic Database and its structures.

Convene a Working Group to work out an Action Plan for the establishment of the African Regional Geographic Database. The 1st phase of the Database should be functional by March 2002, in time for the UN General Assembly Summit on the review of the Earth Summit +10.

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LIST OF ACRONYMS

ACMAD	African Centre for Metrological Application and Development
ADF	African Development Fund
APSDI	Asia and Pacific Spatial Data Infrastructure
AOCRS	African Organisation for Cartography and Remote Sensing
CEOS	Committee on Earth Observation Satellite
CODI	Committee on Development Information
CORINE	Coordination of Information on the Environment
CRTO	Regional Remote Sensing Centre
CSD	Commission for Sustainable Development
ECOSOC	Economic and Social Council
ESI-AFRICA	A Network for the Cooperative Management of Environmental Information
EUROGI	European Organisation on Geographic Information
FAO	Food and Agricultural Organisation
G77	Group of 77 Developing Nations
GATT	General Agreement on Tariff and Trade
GIS	Geographical Information System
GPS	Global Positioning System
GRID	Global Resource Information Database
GSDI	Global Spatial Data Infrastructure
IBRD	International Bank for Reconstruction and Development
IJC	International Court of Justice
IDA	International Development Association
IFDA	International Fund for Agricultural Development
ISO	International Standards Organisation
ITC	International Training Centre
NMOs	National Mapping Organisations

NSIF	South African National Spatial Information Framework
OAU	Organisation for African Unity
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PC-GIAP	Permanent Committee on GIS Infrastructure for Asia and the Pacific
PC-IDEA	Permanent Committee on Spatial Data Infrastructure for the Americas
RCSSMRS	Regional Centre for Services in Surveying Mapping and Remote Sensing
RECTAS	Regional Centre for Training in Aerospace Services
SRDC	Sub-Regional Development Centres
SADC	Southern African Development Community
UN	United Nations
UN-NADAF	United Nations New Agenda on Development of Africa
UNCLOS	United Nations Conventions on the Laws of the Seas
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environmental Programme
UNF	United Nations Foundation
UNRCC-Americas	United Nations Regional Cartographic Conference for Americas
UNRCCA	United Nations Regional Cartographic Conference for Africa
USA	United States of America
WTO	World Trade Organisation

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