

THE USE OF REGIONALLY OWNED SPACE INFRASTRUCTURE FOR DISASTER MANAGEMENT IN WEST AND NORTH AFRICA

***15TH – 16TH OCTOBER 2007
ROCKVIEW HOTEL ABUJA***

RAPPATEUR REPORT

The workshop commenced with the welcome address delivered by the Director General, National Emergency Management Agency (NEMA). The DG, NEMA highlighted the objectives of the workshop to include:

1. Assessment of the current status of space infrastructure owned and operated by Northern and Western African countries with disaster management as principal objectives.
2. Review current and future developments and achievements to date
3. Review limitations and deficiencies in data quality, availability and use
4. To explore enhanced capacity building, regional networking and learning from other regional experience that can lead to better use of available technology beneficial to our region in general, and Nigeria in particular.

He identified the recent developments of the use of space-based technology for disaster management as a move in the right direction. He then expatiated on the partnership between his agency and National Space Research and Development Agency (NASRDA) in exploration of space-based technology for disaster management. On a final note, he decried the uncoordinated use of space technology in West and North Africa for disaster management. He hoped that the workshop will bring together all the stakeholders and foster better working relationships between countries through meaningful discourse, networking and exchange of ideas and skills in order to better manage and mitigate disasters that affect the region.

The Director General, National Space Research and Development Agency (NASRDA) gave the goodwill message, in which he noted that disasters such as floods, tsunamis, earthquakes, drought, desertification, forest fires and volcano eruptions are rife world over. According to him, these disasters are not limited by geographical boundaries. He made an example of the 2004 Tsunamis disaster that hit South East Asia and also extended to the coasts of Somalia in Africa. He therefore emphasized the need for preparedness by African countries to mitigate and manage both natural and man-made disasters. He identified space technology as an invaluable tool for disaster mitigation, which Africa should take advantage of.

The workshop was formally declared open by the representative of the Ambassador of the Netherlands Marjo Crompvoets, who is the Deputy Head of Mission. She traced the genesis of this workshop to the relationship between RECTAS and ITC Netherlands some 3 years ago, which has produced 63 trainees in geo-informatics at the levels of Postgraduate Diploma, Professional Masters and M.Sc from 9 different West and Central African countries.

As one of the organizers, Dr. Norman Kerle of ITC presented an overview of the workshop noting the purpose, objectives and outline of activities of the workshop. The growing occurrences of natural and man-made disasters and the accompanying threats have made it pertinent to organize workshops and seminars to find ways of addressing the situation. This, he noted, requires institutional and agency collaboration. Dr. Kerle's paper stressed the importance of remote sensing and geo-information tools in disaster management, which can be fully harnessed with growing capacity that is being developed by Nigeria, Algeria, Egypt etc. Data handling and processing is critical in disaster management and this can be achieved through capacity building in institutions such as RECTAS and the ITC. The paper further identified growing extra-regional stimulation through the setting up of UNEDRA, which is designed to meet the needs of African countries. The paper also noted the contributions of the Netherlands Government through NUFFIC, NASRDA and NEMA in funding the organization of the refresher course and workshop. The overall objectives of the workshop, the paper noted is to assess the state of the use of space infrastructure for disaster management in Nigeria, and the Western and Northern Africa regions, and identify what is technically possible and what is being done. The United Nations University collaboration with ITC for capacity building in disaster geo-information has been noted as a basic capacity building initiative that can be explored by African countries to develop capacity in this area. United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) to be established in Nigeria will go a long way in disaster alert, early warning and mitigation efforts.

SESSION 1: Regionally owned space infrastructure in northern and Western Africa for Disaster Management – Chaired by Dr. Norman Kerle

1. The NigeriaSat-1 Infrastructure – Developments, Prospects, Data Use – Dr. G.I. Agbaje, NASRDA

This paper highlighted the current and future developments in the space technology industry in Nigeria, which were the establishment of the National Space Research and Development Agency (NASRDA) in 1999; approval of the National Space Policy in 2001; the launch of NigeriaSat-1 in September 2003; the development of National Geospatial Data Infrastructure (NGDI); the launch of NIGCOMSAT-1 in May 2007; space-based research and applications for sustainable development and disaster management; capacity building and Know-How Technology Transfer (KHTT); international cooperation; the proposed launch of high-resolution NigeriaSat-2 in 2009; and the development of the African Resource (& Environmental) Management Satellites (ARMS) Constellation. The various application areas of space technology in Nigeria as highlighted in the paper include Flood Study at Shiroro Dam; Fire scare mapping and monitoring, Gully Erosion Mapping/Monitoring in Southeast Nigeria; Satellite-based Integrated Environmental Change Research in the Niger Delta; Lake Chad monitoring; Hurricane Katrina Monitoring using NigeriaSta-1 etc. The paper decried the under-utilization of available African satellites in disaster management across Africa. The paper also identified poor quality of data collection and management practices, lack of adequate

data infrastructure and lack of skilled human capacity in natural resource and environmental management as root causes of under-development in Africa.

The paper concluded on the need for Africa to invest in resource information and mapping, which requires commitment towards capacity building and knowledge transfer, joint participation and international cooperation.

2. Application of GNSS in Disaster Management, Reduction and Emergency Response – Mr. John Momoh, Nasrda.

This paper highlighted the various application areas of GNSS in disaster management as well as its importance in the different phases of disaster management and emergency response. The paper highlighted data acquisition techniques for GIS mapping and analyses for the assessment and mitigation of disasters, as well as devising appropriate relief strategies in times of disasters. Application areas of GNSS to include monitoring tectonic movement and landslides, prediction of earthquake and volcano eruption, structural monitoring of dams, skyscrapers etc, assessment of sea level rise for coastal flooding, emergency response, search and rescue operations and fleet management and tracking. The paper discussed the proposed Nigerian NSBAS system which will be used for alert messaging. The NSBAS will be based on the GPS augmentation capabilities of NIGCOMSAT-1 through its L1/L5 frequencies. The NSBAS system will provide a full coverage of Africa, a characteristics all other similar systems such as EGNOS, GANGAN, MSAS, WAAS etc lack. The paper concluded on the note that existing GNSS systems as well as SBAS systems including Nigcomsat-1 should be optimally utilized for DM and emergency response. Africa has a whole needs to build capacity in the application of GNSS in DM and ER and there should be intense collaboration of all space agencies and relevant bodies in Africa and other parts of the world.

3. Use of Satellite Images to Map Flood Extension around the City of St-Louis in Senegal - Aliou Mamadou, Senegal

The paper gave a brief overview of the RS application projects in Senegal which are about real time monitoring. Some research projects being carried out by the University of Dakar is highlighted and the collaboration with international agencies such as ESA was also mentioned. Some of the projects are:

- a. Remote Sensing characterization of watersheds for surface water resources management in Senegal
- b. Contribution of Remote Sensing data to flood management in the river delta Senegal and Saint Louis (Northern Senegal)
- c. Exploitation of MSG data for rain season monitoring and identification of vulnerable zones in Senegal
- d. Use of Remote Sensing for hydrous erosion assessment and its impact to urban development: the case of Nioro (Senegal)
- e. Monitoring bush fire using NOAA AVHRR and MODIS

The presenter concludes that many of the projects are continuous research works, which will require the use the NigeriaSat-1 data.

Session 2: Geo-Information and Disaster Management in Northern and Western Africa – Chaired by Prof. J.F. Olorunfemi

4. Towards an Oil Spill Monitoring System for the Gulf of Guinea: The Need, Possibilities and Challenges - J. Udoh, University Of Uyo.

The paper explored the use of remote sensing and GIS in monitoring oil spillage in the gulf of Guinea. The paper noted the importance of the region as it contributes about 5% of the world's daily consumption of petroleum products as well as containing about 48% of the world's reserve. Oil spillage and its poor management by oil companies necessitates a proactive drive towards ameliorating it by a comprehensive study which will identify the locations and sites for mapping, database creation and planning. The presenter stressed the urgent need for a comprehensive plan of action to avoid further degradation of the environment and also to prevent the deterioration of the environment to spread to other countries of the region.

5. The Use of Geo-Data in Disaster Management in Nigeria – Dr. Halilu Shaba, NEMA

The paper focused on the National Emergency Management Agency (NEMA) and the activities of the agency, most especially in the area of using geo-data in disaster management in Nigeria. NEMA has been in the fore-front of disaster management, mitigation and relief services in Nigeria. NEMA deploys the use of the search and rescue satellite (COSPAR-SARSAT), GIS and remote sensing techniques for its operations. With regional offices in each of the six geo-political zones of the country, supported by a well equipped GIS/remote sensing laboratory, NEMA is well positioned for carrying out efficient disaster management and emergency response services. The paper identified the role of spatial data to the various stages of disaster management cycle to include real-time monitoring of disaster, disaster management preparedness stage through hazard and risk maps production, and damage assessment after the hazard to help in relief and rehabilitation. Space-based technologies have great advantages of synoptic coverage, timeliness, multi-spectral rendition, long time cost reduction, repetitive coverage and providing more accurate mapping while amenable to slight variation. The paper also captured the efforts of NEMA at acquiring, digitizing and processing maps in order to obtain accurate geo-data for disaster management. The paper concluded on the note that NEMA has been working towards full utilization of space satellite information through capacity building, collaborative efforts, international networking and continuous consultations.

6. Managing Disaster Risk Reduction in an Age of Geo-Information Revolution– Prof. Bola Ayeni, University of Ibadan

This paper recognized that disaster management goes beyond the procurement and supply of relief materials to victims of disasters to include providing necessary atmosphere that is conducive for full recovery and return to the pattern of life that was disrupted by the occurrence of the disaster. Also, there is the need for a greater level of data disaggregation than presently exist or presently planned for. For instance, information needs for disaster risk reduction could be different from those needed for monitoring natural disasters as the scale of investigation moves from the realm of national, state and local government level data to information on communities and smaller groups of people. The main hub of the paper was to share experience in addressing the issue of disaster management from the point of view of geo-information needs by focusing on the unifying role of human factors in the propagation of disasters whatever their origins, the evaluation of their impacts and the need to stress the disaster risk reduction rather than disaster relief propagation should constitute a veritable focus of attention. The presenter indicated that disaster risk reduction should be the basis for developing information systems for disaster management. He defined disaster risk reduction as “the systematic development and application of policies, strategies and practices to minimize vulnerabilities and disaster risks throughout a society; to avoid (prevent) or to limit (prepare and mitigate) adverse impacts of hazards, within the broader context of sustainable development”. Disaster risk reduction seeks to pre-empt a disaster and also to put in place following a disaster a rehabilitation process that rebuilds resilience to future disasters. Consequently, disaster risk reduction focuses on policies and practices that minimize disaster losses by addressing interventions in three broad areas of hazard minimization, reducing exposure and susceptibility; and enhancing coping and adaptive capacity. A system of comprehensive risk assessment and analysis, based upon detailed and accurate information on hazards and people’s vulnerability to them, is thus a pre-requisite to an adequate and successful disaster reduction strategy. He stressed the need for capacity building, infrastructure development, and international collaboration and cooperation in order to fully face the challenge of disaster risk reduction.

7. Data Availability and Sharing Prospects for Improved Automation and Access – Dr. Jide Kufoniyi, RECTAS

The importance of geo-information (GI) in solving sustainable development problems cannot be over-emphasized. GI is required for the realization of MDG, NEPAD, NEEDS, WSSD objectives. The paper decried the current state of inadequate data and non-availability in usable forms. It therefore stressed the need to develop a platform to access and develop appropriate methodologies for GI production, management and dissemination from remotely sensed images and in-situ spatial data in Africa. The presenter identified the need for participation of countries in the African Resource Management Satellite (ARMS) constellation and also the need for appropriate pricing/licensing policy to facilitate access to data as pre-requisites to continental and regional development. Also, African nations need to make optimum use of already available satellite systems such as NigeriaSat-1, Alsat etc in order to acquire standardized datasets. This can be achieved through the establishment of scientific and technical working groups which will focus on the formation of African SSE policy on disaster management. Lack of foreign exchange, low ICT infrastructure and less-than-adequate

capacity due to brain drain in Africa are the bane of GI availability, accessibility and usage in Africa. Finally the presenter made recommendations on the necessity for Partnership, production of FDS & Custodianship rights & responsibilities, establishing data standards, metadata for data discovery and use, improved regional access to policies & data license principle for African EOS, implementation of AFREF, improved ICT infrastructure.

8. Spatial Data Infrastructure and fundamental data sets for Disaster Management - Patrick van Laake, ITC Netherlands

Disasters always come uninvited, often unannounced and they always wreck havoc in terms of loss of lives and properties and damages to infrastructure (transportation, telecom, power). In order to mitigate the impacts of disaster attention should be placed on the use of spatial data. Spatial data for disaster management comes in three flavours

- Natural resource data e.g. topography, geology,
- Socio-economic data such as transportation, telecom, etc.
- Impact assessments like overview maps of affected areas, water depths, etc.

The presenter identified time as of essence when disaster strikes. Consequently, procedures have to be prepared beforehand and all stakeholders have to implement these procedures. The presenter advocated that data sharing should preferably be done through an automated system, e.g. the internet, with minimal operator interaction. Also, international standards for data discovery and dissemination should be followed, e.g. UNSDI with GeoNetwork. The importance of collaboration with neighbours and within the country was stressed. This can be done with legislation or policy backing. Internationally, countries have to agree on content and terms of collaboration. Satellite imagery and satellite communications are good examples of that can be shared during an emergency.

9. Deforestation and Implications on climate change in Africa - Prof. Ayobami T. Salami, Obafemi Awolowo University, Ile-Ife

The objective of this paper was to examine the trend of deforestation in Africa using a case study each in East and West Africa. The paper highlighted the implications of deforestation on climatic variability and proposes a geo-spatial data framework for greenhouse gases (GHGs) and land use documentation in Nigeria. It has been noted that reduction in freshwater supply over sub-Saharan Africa is partly man-made in the context of massive deforestation currently going on in the region. The paper showed that there is decrease in precipitation in the Sahel and Sudan Savanna zones of Nigeria resulting from disturbance of atmospheric circulation caused by deforestation in southern Nigeria and 60% of water content in the clouds in the middle and Northern Nigeria originates from evapotranspiration of the humid rainforest and the adjacent semi-humid rainforest. The status of the forest in Nigeria therefore has significant implications for climatic variability. Therefore, land use assessment and monitoring needs to be integrated into climate change programmes. NASRDA commissioned a project to assess the capability of NigeriaSat-1 for forest assessment and monitoring. It is a multidisciplinary study involving several institutions and scientists. The result of the project showed that in the

South West zone epitomizes the tropical rainforest in Nigeria with deforestation progressing at the rate of 1.36% per annum. This is higher than the rate of 0.76% quoted for the country by FAO and lower than the estimated rate of 3.5% currently being used by the Federal Department of Forestry, but falls within the rate of 1.0-1.5% given for the developing countries by World Bank. In conclusion attention should now be focused on the establishment of a remote sensing-based framework for land use database development, especially with the advent of DMC satellites and low cost satellites (like NigeriaSat-1) and their potentials for environmental management. African countries are now in a better position to monitor the trend of deforestation over the continent and thereby provide a more reliable land use feedback for climate change modelling.

10. The Use of Space Data in Disaster Management in Eastern Africa Sub-Region - Erick Khamala, RCMRD, Kenya

The RCSSMRS now renamed RCMRD was established in Nairobi in Kenya in 1975 under the auspices of United Nations Economic Commission for Africa (UNECA). It is an Inter-governmental Organization. Currently the Centre has 15 contracting member among which are Botswana, Comoros, Ethiopia, Kenya, Uganda, Zambia. The Centre's mission and objectives are geared towards promoting the application of Geo-information in sustainable development of Africa, while the vision is to become a Centre of Excellence in Geo-information in Africa. The Centre collaborates with numerous national and international organizations and companies including Environmental Systems Research Institute (ESRI), The USGS / Fewsnets Early Warning Systems, International Institute for Geo-information and Earth Observation (ITC), UN Economic Commission for Africa (ECA), National Aeronautical Space Agency (NASA), and European Space Agency (ESA). The role of RCMRD in Disaster Management in Eastern and Southern Africa is to strengthen national and regional capabilities in the area of Remote Sensing and GIS to cater for early warning information for food security, natural resources and disaster management.

Session 3: Regional and International support and best practice – Chaired by

11. The Role of UNOOSA and the International Charter “Space and Major Disasters” - Dr. Norman Kerle, ITC Netherlands

International Charter is a charter formed on cooperation to achieve the coordinated use of space facilities in the event of Natural or Technological Disasters. Also known as the International Charter on “Space and Major Disasters”, the charter was created as a result of UNISPACE III in 1999 initiated by the European and French Space Agencies (ESA, CNES) in 1999. The aim is to provide a unified system of space data acquisition and delivery to those affected by natural or man-made disasters through authorized users. The members are European Space Agency (ESA), Canadian Space Agency (CSA), Japanese Space Agency (JAXA), Disaster Monitoring Constellation (DMC) etc. OOSA was accepted as a Cooperating Body to the Charter in March 2003 and has been playing a leading role for years and operates the 24-hour hotline and list of focal points. There are, however, some problems which include lack of transparency in post-disaster relief

efforts, too many players, confusion from user's perspective and the Charter's sole focus on response. It is encouraging that the Charter was setup, and critical products are made available quickly and free of charge. SPIDER has the potential to become a unified effort, a one-stop shop coordinating data/map provision, manuals, best practices, case studies. The need for the charter to be expanded to pre-disaster phase, complex humanitarian emergencies is very necessary and there should be a better assessment of data quality, better access to data, and stronger links to user.

12. Implementation of the United Nations Platform for Space-Based Information for Disaster Management and Emergency Response (Spider) In Africa - Dr. J. O. Akinyede, NASRDA

The presenter identified the fundamentals or essentials life support systems to include unpolluted air, clean water and food or agricultural resources, wholesome environment, which are usually disrupted or negatively affected in the occurrence of disasters. Disasters are either of natural or artificial origin. Irrespective of the origin of a disaster, the effects can be extremely damaging and could result in environmental degradation, diseases, hunger and death. The presenter categorized Africa as a receiver of the world post-disaster humanitarian services with little or no efforts/initiatives put in place to effectively manage disasters in the continent despite the high rate of disaster occurrence in the continent. The significant roles of space-based systems, such as satellites, play in disaster management and emergency responses are duly highlighted. This led to the establishment of the Platform for Space-based Information for Disaster Management and Emergency Response (SPIDER) by the United Nations General Assembly in December 2006 to address disasters on a global scale. SPIDER is to provide universal access by all countries and all relevant international and regional organizations to all types of space-based information and services related to disaster management. The gateway function of Africa SPIDER is to be a 'one-stop shop' for access and dissemination of data and information for disaster management and to bring together the disaster management and space communities within the continent so as to understand operational mechanism as well as possible solutions according to needs and requirements of the user community. The paper praises the unrelenting efforts of the global community in finding appropriate and long-term solutions to disasters. The paper concludes on the note that there is need for collective and individual, national and African regional efforts to strengthen and step-up appropriate systems and programmes for the emplacement of an effective disaster management system.

13. Interregional Support for Disaster Management - Mlengi Fanuel Mgendi

University Network for Disaster Risk Reduction in Africa (UNEDRA) is an initiative aimed at enhancing the ability of African Universities to contribute towards Disaster Risk Reduction. It was formed during a workshop organized by International Institute for Geo-Information Science and Earth Observation (ITC), the Netherlands and the Makerere University, held at Makerere University, Kampala, Uganda in September 2005 under the framework of United Nations University Programme on Disaster Risk Information Management. It has a number of individuals from African Universities and DRR

institutions as members. The main aim is to forge interaction amongst universities in Africa with interest in teaching on disaster risk reduction, through information sharing, capacity building and collaborative research. It affords a forum for sharing experiences on course activities that have already been initiated and also identify universities that have interest in developing Disaster Reduction courses. The paper also mentions the African Urban Risk Analysis Network (AURAN) established with the aim of supporting significantly increased action by local governments, NGO's and community based organizations in urban areas, in order to identify and act to reduce disaster risks. Another institution is the PHREE-Way, which is a global action-learning consortium of organizations working together to expand education and strengthen capacity for disaster risk reduction and humanitarian action towards sustainable development and human security. All members adhere to human security, sustainable development, and humanitarian imperatives, as well as globally-recognized ethics and standards. Africa has complex risk profiles (natural and human factors) and better understanding of this complex will help in reduction of risks from disaster. Importance of research should be appreciated. With limited capacity and scarcity of resources challenges can be worked around if there is national or regional collaboration between these numerous organizations and agencies dealing in disaster management and risk reduction.

Session 4: Improving Disaster Management Capacity in Western Africa – Chaired by

11. Training Achievements and Prospects at RECTAS – Dr. Jide Kufoniya, RECTAS

Regional Centre for Training in Aerial Surveys (RECTAS) was established in 1972, under the auspices of the UN ECA with full diplomatic status in the Federal Republic of Nigeria. It is composed of 8 member States, namely: Republic of Benin, Burkina Faso, Cameroon, Ghana, Mali, Niger, Nigeria, and Senegal. It was funded by member states' assessed contribution and internally-generated income. With a vision to provide a one-stop African solution for capacity development in geospatial services for sustainable development and a mission to contribute to rapid sustainable development of member states in particular and Africa in general, through the development of critical capacity for timely delivery and responsible use of appropriate geospatial information, RECTAS aggressively pursue provision of long-term theoretical and practical training in Photogrammetry, remote Sensing, GIS and Cartography. In addition to this, the institution provides advisory and consultancy services, and exchange of information and knowledge in the fields of aerospace surveys and the environment through seminars, workshops and short-term courses, which can be regular or customized. RECTAS also collaborates with ITC, Netherlands on the award of M.Sc in Geo-informatics in which participants receive sponsorship from ITC and RECTAS. RECTAS has successfully utilized NigeriaSat-1 data for fire scare detection and monitoring, land use/land cover mapping, image mapping and urban growth analysis.

12. Towards an enhanced University Network for DRM in Africa – Dr. Mohammed Usman, Federal University of Technology, Minna

The paper considered the need for networking and how to make it work. The paper also elaborated on the UNEDRA activity framework. According to African Union, scientific and technological development is a learning process that is largely achieved by countries through cooperative or collaborative efforts of sharing experiences, information, infrastructure and other resources, human and financial. Today, no country can secure higher levels of scientific advances and technological progress without interacting with its peers and neighbours. The presenter indicated that virtually all professional bodies are relevant to the DRM, but there is the need for them to network rather than operate independently. R&D institutions in Africa should be required to play leadership roles for DRM. UNEDRA is an institution endorsed by the UN, with institutional members in all regions of Africa. The paper concluded that networking is a 'must' if academic institutions are to play their roles as agents of change. Effective networks are powered by commitment, ideas and funds. UNEDRA is on this track and all lovers of disaster-free African development are welcome to join the train.

BREAK-OUT SESSION GROUPS

RECOMMENDATIONS

GROUP 1: Ways to improve data sharing and collaboration between countries and organizations.

On data sharing, the following recommendations were made:

- ❖ Creation of websites for information exchange
- ❖ Bulletins similar to the ones produced by W.H.O. This may be produced quarterly
- ❖ Building capacity to attain efficient data collection and sharing
- ❖ Inventory of all available data and standardization
- ❖ Implementation of spatial data infrastructure
- ❖ Identification of data collection and needs
- ❖ Regular meetings and awareness programmes in the media
- ❖ Use of appropriate languages so that the broader access to data available can be attained

Also, there should be data access policy that addresses issues of confidentiality and commercialization. There should be identification of data needs for different phases of disaster e.g. prevention, mitigation, post disaster etc. Furthermore, there is need for independent bodies, that is, quality control bodies to certify quality data before making it public. Data should be generated from the lowest government level to the highest level. Geo-information policy should be approved and funded adequately. Research on social aspects of disaster

On collaboration between organizations, the following were recommended:

- There is need for seminars and workshops on a regular basis so to foster interactions between organizations
- Regular simulation exercises should be organized for different disaster scenarios
- There should be understanding between data generating bodies or organizing bodies such that the responsibility of data generation and sharing must be defined and shared by all stakeholders
- Stakeholders must be aware of each others responsibilities to avoid duplication
- There is need to involve the bureau of statistics in the scheme of things
- Organizations such as NOA should play an important information dissemination
- Proper funding and building of capacities of organizations.
- NASDRA should play a very important role by reaching out to other stakeholders and display there products

On collaboration between countries, it was decided that there should be:

- Bilateral meetings of countries on data sharing, knowledge sharing, best practices etc
- Regional licensing policy on data sharing
- Regional policy on disaster management to be domiciled in African Union and the Sub-regional ones e.g. ECOWAS

GROUP 2: New application for disaster management constellation

The following was agreed on:

- Africa should have a common forum to approach disaster monitoring
- NEPAD should be a key driver for cooperation in use of Space technology
- Ground stations can be established in the various regions to reduce cost of data acquisition
- Organize more workshops
- Create a spatial data base for DMC data
- AU should advocate use of African satellites data
- Public enlightenment and awareness of the availability of data from Nigeria Sat-1 and Algeria satellite
- African governments and agencies should prioritize use of DMC data
- Bush Fire monitoring
- Regional and urban mapping
- Boundary demarcation
- Environmental monitoring
- Pollution monitoring

In conclusion:

- More integrated approach through regional cooperation
- Partnership with DMC to provide special mapping projects for Africa
- Need for use of local resources to meet the challenges in accessibility of satellite data

GROUP 3: Ways to Benefit from the GEOSS and GMES Initiatives

- Most people are not familiar with the GEOSS/GMES concept
- GEOSS is a system of systems
- But there are many competing and overlapping initiatives within this system and that is confusing stakeholders who desire relevant information/data from the system.
- Again, these competing bodies or initiatives are often time short lived due to lack of funding.
- The MSG satellite is part of GEOSS and Africa is already receiving high resolution images/data from GEOSS.
- The crucial problem to be addressed is how the stakeholders would make their data available to GEOSS.
- There should be an MOU between GEOSS and relevant stakeholders on hold to make it easier for information to be available to GEOSS.
- There should be data sharing policy.
- It should be a prerequisite that anybody or organization generating data and requires data should also be able to share their data.
- Nigeria has something to offer and they should be thinking of how they can contribute to the database of GEOSS

- It is the responsibility of stakeholders to access information available within GEOSS.
- Informing and educating decision makers is a key to improving funding and political willingness towards this initiative.
- Monitoring and evaluation of available capacity should be emphasized
- There is need to refocus our capacity building paradigm.

GROUP 4: Organization and prospects of an extended university network.

Following discussions on the Organization and prospects of an extended university network, the group agreed as follows:

- For the two years of existence of UNEDRA, groundwork has been done.
- All universities and research institutions with interest and inclination to Disaster Management in Africa be invited to join UNEDRA.
- We need to develop UNEDRA strategic plan, to strengthen the organisation.
- Curriculum for Common postgraduate course in Disaster has been drafted by UNEDRA in 2006, which can be adopted.
- At lower levels of education, common curriculum for studies in Disaster Management should be developed.
- To join UNEDRA, University leadership needs to be involved: letters of invitation to join UNEDRA. Governments need to be involved where and when relevant.
- Governments need to be involved where and when relevant.
- A stand alone UNEDRA website is needed urgently.
- UNEDRA needs to broaden the scope of its activities.

The following recommendations were made:

- Oct.-Dec.2007 - Intensive sensitization and discussion between contact Persons and heads of institutions
- Dec.2007 - Signing of MOU by new members
- Jan.-March 2008 - Draft of a 5yr action plan

Contact: Dr Norman Kerle at kerle@itc.nl