African Leadership Conference on Space Science and Technology for Sustainable Development

Communiqué from the First Conference Held in Abuja, Nigeria
23 – 25 November 2005

1. BACKGROUND:

1. In August/September 2002, the world gathered in Johannesburg, South Africa at the World Summit on Sustainable Development (WSSD) to consider the strategies for achieving sustainable development globally. During the summit the international community took major decisions with a collective responsibility and commitment to haul the world’s 2 billion poorest, with majority Africans, out of misery, disease and poverty and restore/nurture the damaged environment. Specifically 189 States of the world pledged their support to the implementation of 170 agenda items for which many African countries remain totally committed.

2. Consequently, the UN Millennium Development Goals adopted in September 2002 in New York, committed nations to a new global agenda to reduce poverty, improve healthcare, and promote peace, education, human rights, gender equality and environmental sustainability. The MDGs are the world’s time-bound programmes, with year 2015 as deadline and targets for addressing extreme poverty in its various dimensions, such as income poverty, hunger, disease, ignorance and lack of access to adequate shelter and energy. Interestingly, all these are a restatement of African basic human rights and needs as contained in the universal declaration of human rights. The goals are also the most specific and comprehensive poverty reduction targets that the world has ever established in which rich and poor countries are committed to a partnership for sustainable development and poverty reduction.

3. The role of space science and technology in achieving the MDGs and WSSD objectives cannot be over-emphasized. To meet the challenges, some African countries such as South Africa, Algeria, Morocco, Nigeria and Egypt have been committing their efforts to Development and application of satellite technology for sustainable national development. Each of these countries has developed, at least a limited capability in the building of micro satellites. Egypt and Morocco for instance have built and launched small communication satellites and Nigeria is presently implementing its plans to launch a communication satellite in December 2006, South
Africa, Algeria and Nigeria have also built and launched micro satellites. The five countries have been very active and have made meaningful contributions to COPUOS and its Subcommittees. The activities of few others, such as Kenya, Ethiopia, Ghana, Burkina Faso, Senegal, Niger, Angola, Sudan, Libya, Zaire, and Uganda are limited to the use of space data for socio-economic development.

4. Furthermore, the objectives of the scientific and technological programme of the New Partnership for Africa’s Development (NEPAD) focus on the core challenges of boosting food production, health, energy, mining and industrial production, as well as assessing the extent and rates of desertification and deforestation and their impacts on food and livestock production. NEPAD is providing a platform for scientific excellence in Africa in order to be globally competitive and contribute to the socio-economic development of the continent. These noble objectives form the bedrock for the proposed African Resource and Environmental Management (ARM) constellation satellites. The African countries involved in the ARM project, Algeria, South Africa, Nigeria and Kenya, have agreed to collaborate and provide high resolution satellites with a low cost and interactive ground stations to facilitate access to rapid, unrestricted and affordable satellite data for African user community.

5. It is against the foregoing background that, consultations were held among African member states during the 48th sessions of the Committee on the Peaceful Uses of Outer Space (COPOUS) to commence the organization of African Leadership Conference on space science and technology for sustainable development. The first African Leadership conference was held in Abuja, Nigeria from 23rd – 25th November, 2006. The Abuja conference reflected on the role of space science and technology in Africa’s present and future development, and also considered the corresponding commitment to the relevant knowledge and technology development. The development and growth of the segment of the information economy, which is presently being driven by space technology, can only be enhanced by giving greater priority to the development and transfer of knowledge and skills through capacity building, joint participation, and knowledge sharing and bilateral and international cooperation. In order for Africa to maximize the benefits inherent in space technology therefore, it is crucial that we complements the aforementioned efforts with others that can enhance and broaden Africa’s participation in and contribution to the development and application of space technology.

2. **OBJECTIVES OF THE CONFERENCE:**

The Abuja conference was attended by participants from 17 (Seventeen) African countries and 4 (Four) UN bodies including COPOUS and Economic Commission for Africa (ECA). The African countries represented are Algeria, South Africa, Kenya, Egypt, Ghana, Republic of Benin, Nigeria, Chad Republic, Niger, D.R Congo, Uganda, Angola, Gambia, Eritrea, Sierra Leone, Ethiopia, Morocco, Austria, and Libya as well as other countries such as USA and UK. Participants are the ministers and chief executives of space related programmes or their representatives. The conference addressed the following issues which were set as the main objectives.

- To sensitise all African member states of the United Nations -General Assembly and COPUOS of the need to participate and be more active in COPUOS activities.
- To provide a forum for exchange of ideas on African problems and the impact which space technology could have in solving the problems.
- Bridging Gaps and new orientation for African countries in space technology.
• Appreciation of global activities and capacity building in space science and technology with a view to exploiting them for the development of Africa.
• To sensitise African countries as a whole to be pro-active in the full implementation of UNISPACE III recommendations. (UNISPACE III is the third United Nations conference on the exploration and peaceful uses of outer space).

3. SUMMARY OF THE PAPERS PRESENTED

The conference focused on 6 major issues of interest as outlined below:

3.1 Africa’s needs and problems that can be addressed with the Aid of space science and technology (SST):

The conference focused on issues and problems in Africa that can be addressed through the applications of Space Science and Technology (SST). Some of the areas highlighted include the development and management of natural resources such as air, water, agriculture, soil, forestry, minerals as well as the need to achieve a sustainable development in the areas of energy, healthcare delivery, defence and security, communication, tourism, demography, transportation, urban planning and environmental and disaster management. All these underscore the significance of SST as one of the key vehicles for addressing developmental issues in Africa. In addition the role of Space Science and Technology in addressing such problems as unsustainable exploitation of land resources, disease, land and environmental degradation, poverty and bad governance in Africa were outlined. The conference also emphasized on the need to formulate and consolidate African countries’ science and technology plans and policies through capacity building, knowledge production and technological innovation, as well as the need to integrate all aspects of SST strategies for sustainable resource and environmental management in Africa. It was noted that coherent implementation of government policies is critical to actualizing development in SST in Africa, and the setting of realistic goals and priorities.

3.2 Aspects of space technology that is most relevant to Africa’s development and growth on a short-term and a long-term basis.

The conference outlined the stages that some African countries such as Algeria, Nigeria, South Africa, and Morocco have passed through and the successes recorded in applying space science and technology for socio-economic development and environmental protection. The importance of achieving regional and global development goals such as NEPAD and the Millennium Development Goals using science and technology innovations were emphasized. The conference argued that African countries need to address the issue of policy development in space science and technology to maximize the benefits from its applications. Accordingly, a number of recommendations were made which include the need to realize and strengthen the African Resource and Environmental Management Satellites (ARM) and to strongly support space science and technology education at all levels.

It was also emphasized that space science and technology has a lot of potentials, although Africa as a whole is still at the background. Future directions for Africa in this area were outlined, which include among other things, development of partnership within African countries and strengthening of space research and the Linking, Leveraging and Learning for African countries to benefit from the expanding opportunities offered by SST.
For example, the Alsat-1 project was reviewed from conception to date and much emphasis placed on its performance especially in the areas of disaster monitoring, its uses in the northern Algerian fire campaigns between 2003 and 2005 were demonstrated. The determination of Algeria to continue the space application development through the Algerian Space Agency and the universities and the plan for a national capacity building through unit of development of small satellites were discussed.

### 3.3 African’s challenges and capabilities (Human and Material) in the space field and their deployment to date to meet the challenges of development.

The conference examines the mandate of the African Regional Centres for Space Science and Technology Education which includes SST applications in four main areas:

- Remote Sensing/GIS
- Satellite Communications
- Satellite Meteorology
- Basic Space and Atmospheric Science

Some of the factors outlined as reasons for the slow rate of SST development in Africa include low GDP/huge external debts, lack of basic infrastructures, limited space research/development programmes, brain drain syndrome and huge costs of training personnel among others. The conference also examine the educational and capacity building programmes in SST run by the regional centres these include post graduate diploma programme for French and English speaking African countries and the “catch them young” outreach to secondary school students.

In addition the concept of Geoinformation and its application in various areas such as agriculture, health and housing were examined. This raised questions for the SST community on whether or not there can be a paradigm shift from “science” to “information society”. In this regard, ECA’s vision for Geo-Information and a wide range of strategies being pursued to realize the vision were highlighted. It also discusses the use of the GIS portal for providing access to geospatial resources, i.e. data and services, in Africa.

Among the other issues outlined are mapping problems across Africa. Experiences of African mapping agencies have shown that traditional methods and the large inaccuracies in maps that are available in the continent are some of the problems. It therefore emphasizes on the significance and use of remote sensing techniques to solve the problem of mapping in the continent.

### 3.4 Past, Current and Future global space programmes and related challenges for Africa.

An historical analysis of the development of space science and technology especially with respect to the role of astronomy was highlighted. The conference remarks among others that observations of space through astronomy led to basic discoveries of things like radio waves, satellite communication, TV, fax, telephone, electronic mail, aircraft, weather forecasting, telemedicine, etc. The advances in SST today came to reality as earlier predicted by Socrates who said that ‘All Human kind must rise above the Earth to the top of the atmosphere and beyond, for
only then he will be able to fully understand the world in which he lives'. In Africa, with the exception of South Africa, not much is happening except in the areas of Meteorology and ionospheric sciences. The conference therefore emphasized on the need to commit more resources to R&D in these areas to give Africa the leverage needed to catch up with advances in SST.

3.5 Existing and future international space agreement/legal instruments – Impacts and implications for Africa.

The conference noted that Space Law is an evolving area and very few universities around the globe teach it as a subject. One of the issues stressed by space law is that the space is “for the benefit and in the interests of all countries irrespective of their degree of economic or scientific development”. The treaty thus seeks to guarantee equality and equity. The key principles the treaty addresses include universal access to space, usage of space for peaceful purposes and non-appropriation of a part or a whole of it. The Outer Space Treaty neither prohibits nor authorizes exclusive acquisition of space resources. However, although the treaty suggests no sovereignty over territory, it is unclear whether there is also no sovereignty over resources. It was also noted that Africa had not been participating in the development of space law, and that this is fraught with a lot of problems. For example, nonparticipation guarantees no influence and that “to write the rules, you must be in the process”. It suggests that African countries need to do more in the area of SST and show greater interest in the development of space law.

Further more, the conference examine the definition of space law as a part of International law, consisting of rules which are legally binding on States in their interaction with each other. It traces the historical development of space treaty and geo-politics and argues that these laws exist to facilitate fair and equal access to the opportunities that SST offers. However, African countries are yet to begin to contribute to the evolution of an all embracing law for the use of space. Part of the problems facing Africa includes the unavailability of local expertise on this aspect. Reference was made to the UNISPACE III conference held in Vienna in July, 1999, which underscores the need for capacity building for Africa and other developing nations on issues relating to space law.

To help African states participate more in the development of space law, the following suggestions were made: - maintaining visibility at meetings, contributing to reports, replying to requests for information and sharing information on space-related and space-law related activities, ratifying or acceding to treaties on outer space; identifying existing national resources and expertise in those areas of importance to each Government; and identifying focal points at home as well as in the diplomatic missions responsible for following these matters.

3.6 The way forward – Strategies for ensuring Africa’s effective and rewarding participation in the space enterprise.

For Africa to make progress and move forward rapidly towards achieving a sustainable development, the conference considered the development of national spatial data infrastructure mandatory for all African countries. The vision is to make Africa a sustainable information society by year 2010. Accordingly, the following strategies become relevant: Building Geo-information dataset development through Earth observation satellites, Dissemination of data; and Capacity building. Geo-Information is about integration of data for improved visualization, analysis, and decision-making. Fundamental datasets must have national coverage and be consistent to ensure that they can help government achieve their objectives. Earth observation
satellites and GIS are important in the process of data collection and integration, and the African Resource Management (ARM) Satellite Project has a big role to play. The conference also outlines the significance of African Reference Frame (AFREF) in the process and the need to develop a GI policy in each country.

Various efforts to harness human and material resources for building and launching of satellites and to explore what it describes as “African Indigenous Technology Development”, including the existence of Satellite Engineering Teams in five countries - Nigeria, Algeria, Morocco, Egypt and South Africa, were highlighted. The efforts also include the strengthening of the Regional Training Centers, such as RECTAS in Nigeria, RCMRD in Kenya and CNTS in Morocco where training of various categories of experts from different countries in the region is being conducted; as well as the various Remote sensing and GIS institutions in the continent. Other strategic areas include investment in the space enterprises and human resources development. The conference argues that Space Program in Africa can be successful in the long term if the achievement of full economic benefit is facilitated and Knowledge economies in the region are optimized.

4 KEY ISSUES RAISED AT THE CONFERENCE AND THE WAY FORWARD

At the end of the three-day workshop a number of issues were raised by participants who were drawn from both the public and private sectors. The issues raised and the recommendations are highlighted as follows;

• The exploitation of the benefit of SST is still very limited largely because most nations in Africa have, on account of poverty and or deliberate refusal, distant themselves from space activities. Many African countries do not respond to international calls for collaboration or joint discussion on space matters. The current chairman of COPUOS (2004-2006), Dr Adigun Ade Abiodun of Nigeria lamented the unwillingness of African countries from attending COPUOS meetings. Out of the current 15 representatives of African countries only a few countries are active. The participants agreed that the Conference communiqué should be presented to the African Union’s through the Regional Conference of Ministers of Science and Technology

• African states should participate actively in Space activities as SST holds the key for the future in every aspect of human development and security. President Obasanjo of Nigeria, in his keynote address, underscored this when he said that “A society that fails to invest in the future may have no future at all”.

• South Africa, Algeria and Nigeria are prominent in space activities in Africa it was noted that South Africa has made further progress such as in the inauguration of South Africa Large Telescope (SALT) on Nov 10, 2005. SALT is the largest optical telescope in the Southern hemisphere and one of the largest in the world.

• African states should put premium on rigorous and aggressive Space Science and Technology Education at all levels. The approach of “catching them young” needs to be pursued to enlist the interest of future leaders in the continent in Space Science and Technology.

• The conference noted that research in SST is expensive and would not be attractive to any investor because the immediate and short-term economic benefits may not be forthcoming. But SST is an investment for the future.
African countries are therefore advised to make Research & Development in SST as one of the priority areas. African countries should avail themselves of the opportunities available in the SST products offered by the advanced countries to solve specific problems and change from old and inefficient systems.

- African leaders should recognize and appreciate SST as implied in their daily use of Space products. Allowing new technologies to “take over” would not lead to job loss. It only requires retraining old staff in the use of new technologies.

- Space law is an evolving area – not taught in most universities around the world. However, an international legal framework already exists to guide the activities of states in the use of outer space. African’s engagement with space law demand that Africa continues to take interest in the activities of COPUOS. Dr Abiodun further remarked, “We have to have a scientifically literate work force if we are to make the advances we so desperately need” and this we can do by investing in SST and space law education.

- African countries need to cooperate and work in partnership by pooling and sharing resources for the development of SST. The benefit of space exploration and utilization is not in space but is to improve and enhance the quality of life here on earth. Africa cannot and should not wait until it has solved all of its problems on earth; Space offers a variety of opportunity to solve these problems.

- African countries must participate actively in SST and space law so as to positively influence charters and agreements in the interest of Africa.

- There is need for Africans to stem brain drain from our Universities and Research Centers as exploit in SST requires the input of such rare talents.

- The conference also identified the need for greater communication between African countries, and between decision /policy makers and the SST communities, as well as the need to encourage private sectors contribution to the development of SST.

- African countries should development and support initiatives such as the ARM and a sustainable Spatial Data Infrastructure SDI development.

5. CONCLUSION

Space technology has convincingly served and will continue to serve as a major tool for providing a better understanding of the natural resources endowment of any nation and the interactions between the environment and society. It has remained the driving force behind most developed and developing economies, particularly in the acquisition of real-time data and a comprehensive and reliable geo-information for sustainable development. Almost every aspect of human problems can be tackled and/or solved, varying from the management and preservation of fundamental life support systems (air, water, food, shelter, energy, affordable health and education and a wholesome environment) to meeting the challenges of weather forecast and their implications for poverty eradication, security, good governance, disaster management and social-economic development, using the relevant platforms and sensors such as remote sensing, meteorology, communication and navigation satellites as backbones. Similarly, the need to achieve a sustainable information society through functional Spatial Data Infrastructure (SDI) can be accomplished by building the information and telecommunication infrastructure in each country.
African leaders, through NEPAD, believed that Africa should no longer sit at the edge as a borrowing and consuming continent; consequently, NEPAD is enjoined to provide a platform for scientific excellence in Africa, particularly in a space-fairing capacity, in order to be globally competitive and contribute to the socio-economic development of the continent.

In order to realize the full objectives of the conference and also maximize the benefits of the development and applications of SST to sustainable development in Africa, it was agreed to hold the African Leadership Conference bi-annually. South Africa and Algeria have offered to host the 2nd and 3rd editions in 2007 and 2009 respectively. It is our collective hope that the AU through the regional conference of Ministers of Science and Technology will endorse this report and circulate it among member states for information and consideration as part of their strategies for national development.