

DRAFT PROCEEDINGS :
WORKSHOP ON DEVELOPING A SHARED PLATFORM FOR
SCIENCE AND TECHNOLOGY FOR AFRICA'S DEVELOPMENT
JOHANNESBURG, SOUTH AFRICA, 17th – 19th FEBRUARY 2003

Introduction and Overview

These are the proceedings of the regional workshop on “Developing a Shared Platform for Science and Technology” organised by the NEPAD Secretariat in collaboration with the Department of Science and Technology (DST) of the Republic of South Africa and held between February 17th and 19th, 2003 in Johannesburg, South Africa.

The Workshop was officially opened by South Africa's Minister for Arts, Culture, Science and Technology Dr. Ben S. Ngubane, and chaired by Prof. A. Babatunde Thomas, Presidential Advisor for Human Resource, Science and Technology of the Republic of Nigeria. It was attended by more than 50 representatives of governments, regional and sub-regional economic integration bodies, the European Commission, United Nations agencies, and the scientific community.

This document comprises the proceedings of the Workshop as captured by the designated rapporteurs, including as appendices the original scripts from presenters where these were available, and is supported by two additional documents which are also available through the NEPAD Secretariat:

- Developing a Science and Technology Strategic Framework: A Synthesis Report of the Workshop
- Complete recorded transcripts of the Workshop on Developing a Shared Platform for Science and Technology for Africa's Development

The document is organised as follows:

1. [Glossary](#)
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Glossary

ACP	Africa Caribbean Pacific
AU	African Union
CETISA	Centres of Excellence for Technological Innovation for Sustainable Development for Africa
CoE(s)	Centre(s) of Excellence
CSIR	Council for Scientific and Industrial Research (South Africa)
DST	Department of Science and Technology (South Africa)
EAC	East African Community
ECA	Economic Commission for Africa
ECOWAS	Economic Community of West African States
ERA	European Research Area
EU	European Union
GNP	Gross National Product
HOSIC	Heads of State Implementation Committee (for NEPAD)
HRD	Human Resource Development
IAC	Inter Academy Council
ICT	Information and Communication Technologies
IDRC	International Development Research Centre (Canada)
IGC	Inter-governmental committee
IK	Indigenous Knowledge
IPR	Intellectual Property Rights
NACI	National Advisory Council on Innovation (South Africa)
NEPAD	New Partnership for Africa's Development
NSI	National system of innovation
OAU	Organisation of African Unity
ODA	Overseas Development Assistance
OECD	Organization for Economic Cooperation and Development
R&D	Research and Development
REC	Regional Economic Communities
RIIA	Royal Institute of International Affairs
RSA	Republic of South Africa
S&T	Science and Technology
SADC	Southern Africa Development Community
S(M)ME	Small (Micro and) Medium Enterprises
UNDP	United Nations Development Programme
UNESCO	United Nations Education, Scientific and Cultural Organization
WSSD	World Summit of Sustainable Development 2002

1. Official Welcome and Opening Statement

Professor Wiseman Nkuhlu

Chairman of the NEPAD Steering Committee and Head of the NEPAD Secretariat

- 1.1 Prof. Nkuhlu opened the conference by acknowledging the delegations and visitors, and expressed appreciation for being at the event, and gave special recognition to Minister Ngubane and Dr. Rob Adams of South Africa's Department of Science and Technology (DST) for their role in raising the profile of Science and Technology (S&T) and organising the Workshop. He also acknowledged Dr. A.Babatunde Thomas from Nigeria who would be chairing the conference, and Mr. Sunday Dogonyaro, Principal Programme Coordinator for NEPAD.
- 1.2 There are five other NEPAD programmes currently being coordinated by different countries; South Africa for political and economic governance, Algeria for human resource development, Egypt for culture and market access, and Nigeria for economic flows. Senegal is yet to send someone to coordinate the Infrastructure programme.
- 1.3 NEPAD was introduced as a shared vision by African leaders to place Africa on a path towards sustainable development and participate actively in the global economy. Through NEPAD, the African leaders are saying "we are no longer going to allow others to define us – to define our agenda and to tell us how we should develop or shape our destiny. From now on we define ourselves, our circumstance, and we develop and articulate our own view of the world. We define the world according to ourselves. In defining how we are going to get there, through NEPAD we have prioritised a number of areas or activities."
- 1.4 The major activities include Establishment of preconditions; Human resource development; Infrastructure development; Partnerships; and Mobilisation of resources.
- 1.5 The Preconditions area has received a lot of attention (peace and security, governance, etc) because, if the Continent is to achieve and sustain high standards of growth and quality of life, Africa has to achieve security. Education, health, and infrastructure (economic and household) are all important.
- 1.6 The Partnership is about a new covenant between African leaders and African people – to ensure that the political regimes are accountable to African people, as well as ensuring political participation.
- 1.7 The NEPAD Partnership is also about the relationship of the continent to the rest of the world. Negotiating a new regime on market access, debt, ODA, participation in international collaboration, and mobilising resources. The issue of taking a strong position on governance has to do with, not only

reducing corruption, but also releasing more resources for development and giving Africans a sense of security and investment.

- 1.8 What permeates through all these priorities is S&T. Without S&T, the goals are just not possible. Development is determined by the ability of countries to internalise S&T. Ability to harness and apply S&T is common to countries that have attained and sustained high levels of growth. Countries differ in the extent to which they are able to generate S&T – and that is important, but that is not as important as being able to internalise and apply S&T.
- 1.9 Africa needs S&T to be able to attend to numerous issues – disease, provide basic services, process industrial resources to high value products, and so forth. Therefore, having resolved to take ownership and responsibility of development, NEPAD must harness S&T towards solving these problems.
- 1.10 The Conference must identify issues that are critical in accelerating scientific and technological development of the African people. The Workshop should also help identifying the unique role NEPAD can play in supporting S&T.
- 1.11 NEPAD looks forward to the Workshop coming up with ideas about what unique contributions can be made [by NEPAD]. This should be based on strengthening political leadership and making sure that the important ingredient to development – political will – is mobilised. It is not only about resources. It is critical to get political leadership to take important decisions and commit themselves.
- 1.12 Prof. Nkuhlu ended by welcoming all the participants to the Workshop

2. Introductory Remarks

Professor A. Babatunde Thomas

Presidential Advisor, Human Resources, Science & Technology Development, Nigeria

- 2.1 Prof. A.B. Thomas began with emphasizing the need to sharpen the scope and purpose of the S&T dimension of the NEPAD initiative. S&T should support NEPAD's goals, especially those of education, health and poverty reduction. All work done should serve as a foundation on which we can build. By end of Workshop, should be able to come up with a statement of commitment with milestones and measurable impact.
- 2.2 Issues of S&T policy, planning and programmes are interrelated, multi-sectoral and crosscutting. These should be an integral part of NEPAD's programme activities as well as in implementation. Key issues include:
 - 2.2.1 S&T as an integral part of key sectors such as agriculture, education, health, industry, environment. Also in the development of human resources.
 - 2.2.2 Role of S&T in economic and beneficial exploitation of natural resources – adding value, reducing poverty, etc.

- 2.2.3 Opportunities for meeting demand through substitution nationally and continentally at competitive costs.
- 2.2.4 Appropriateness of technologies.
- 2.2.5 Import of capital goods, including in support of infrastructure facilities.
- 2.3 There is indifference among some political leaders to matters of S&T.
- 2.4 S&T can play an important role in speeding industrialisation and achievement of per capita GNP targets. The progression of Asian countries was used as an illustration of this.
- 2.5 Without S&T, Africa cannot be saved. It is imperative to make S&T a priority part in the sectoral priorities to ensure implementation and long-term sustainability. It is therefore commendable that the Secretariat is taking timely steps in identifying and following up on S&T.
- 2.6 The challenge is to examine critically the background docs for the workshop, enrich them, and direct ongoing work through an operational framework. Attention will be required in charting the way forward in the short and medium term. Areas to look at include:
 - 2.6.1 Delineation of key S&T challenges and opportunities for the majority of countries in region will be required as a step towards developing shared platforms for collaboration.
 - 2.6.2 Role of S&T and key technologies (e.g., ICT – telecommunication, education, etc., biotechnologies, material sciences) in priority sectoral programmes will have to be identified.
 - 2.6.3 Establishment of appropriate framework for S&T linkages – e.g., policies.
 - 2.6.4 Developing of databases of S&T human resources, institutions, programmes, etc., and establishment of an appropriate framework for use of these databases.
- 2.7 Prof. AB Thomas concluded by indicating that he was looking forward to the individual and collective reflections on the various positions that would be put forward at the Workshop, and committed his support in ensuring that there would be collective success in meeting the challenge in moving forward: developing a shared vision and operational framework on the S&T platform for NEPAD.

3. Keynote Address

Dr. Ben S Ngubane

Minister for Arts, Culture, Science and Technology, South Africa

- 3.1 Hon. Dr. Ngubane addressed the conference stating that the issue of S&T in development had not really taken off, but that a real breakthrough had been achieved in the EU's commitment of funds to the ACP through DG Research.

- 3.2 The Ubuntu statement on S&T (WSSD, August 2002), and the Cape Town Declaration (ACP-EU Forum on Research for Sustainable Development, July 2002) are two base documents to build upon as the Workshop would look towards a proposed draft for S&T in NEPAD.
- 3.3 It is important to emerge from the Workshop knowing how to deploy universities on the Continent, how to extend vocational training to retrain out-of-school youth to be productive in using their hands and technologies.
- 3.4 There is a need to create employable resources and to help people regain their dignity by being able to produce something. Programmes on public understanding of science are important. Children in schools who have been learning only from textbooks need to see real demonstrations, and press in television and radio programming should be mobilised to support the creation of a basic understanding of S&T. This is the only way to legitimise the amounts of money spent on S&T, and to enable S&T for development.
- 3.5 Dr. Ngubane stated the importance of ensuring that "Technology is not a reward, but a tool for development."
- 3.6 By end of the year, there should be clear pilot projects across the Continent to drive economic development and create a pathway of prosperity. There should be nodes in certain countries (e.g., for cocoa in Ghana, or for infectious diseases in a different country), and programmatic, issue-based statements and declarations.
- 3.7 It is important to answer the question of how governments, academicians, and practitioners can help to apply S&T in the various areas that affect Africa.
- 3.8 South Korea was presented as a case in point where they began with imitation and reverse engineering, and today are producing world-class products.
- 3.9 Africa cannot continue to just be the producers of raw materials without benefiting.
- 3.10 Dr. Ngubane concluded with a call to the Workshop to build upon what has been done, strengthen inter-governmental cooperation, build partnerships, and build Africa's people.

4. Policy Changes for S&T in NEPAD

Ms B. Mabandla

Deputy Minister for Arts, Culture, Science and Technology, South Africa

- 4.1 NEPAD has been facing critique, and this is an opportunity to perfect the NEPAD plan.
- 4.2 Africa needs to look at its past to help in developing achievable outcomes that result in strengthening its S&T capacity.
- 4.3 1980 Lagos Plan of Action took note of the state of most African economies and attributed the state of affairs to a lack of industrial development. S&T was identified as a critical instrument for economic growth and development. Other declarations have also recognised the importance of S&T.
- 4.4 There is a visible absence of S&T policies that are aligned to development processes. This may be attributed to an inadequate conceptual linkage between S&T and development, the nature of dynamic industries and their technological requirements, etc.
- 4.5 The complex issue of what Africa spends on R&D is also critical. Figures indicate that higher levels of spending are South Africa at .7%, Senegal .5%, and Egypt .4%. This compared to France at 2.3%, Germany 2.4%, US 2.6%, and Japan 2.8%.
- 4.6 President Mbeki underlines the importance of development of human capital and the integration of technology into social activities. NEPAD recognises that Africa's development and transition into sustainable development requires the harnessing of S&T for human development. This issue of human development calls for acceleration of the development of a critical mass in certain sectors of S&T.
- 4.7 It is recognised that the areas of poverty alleviation, disease, economic growth, etc. provide huge challenges. Addressing these issues necessitates the effective deployment of S&T, and this requires a strategy. Africa requires realistic and sustainable policies to place it on a pathway of sustainable development.
- 4.8 Since the affirmation of democracy in South Africa, the utilisation of S&T platforms to accelerate economic integration and social change has been crucial. If this were taken as an example, the challenges that have been encountered could help in defining strategies.
- 4.9 There is also a big challenge in enabling women to be part and parcel of all the initiatives around S&T. It is important to see women playing a significant role in this area. Research indicates that many households are female-headed which brings about a vicious cycle of poverty.
- 4.10 Hon. Ms. Mabandla closed with asking the experts at the Workshop to help S&T work for the people. S&T experts should help NEPAD to address disease, improve quality of life, be competitive on the global level, and be competitive economically.

5. Issues Paper: Developing a Shared Platform for Science and Technology for Africa's Development

Dr. John Mugabe

- 5.1 2) set of interventions that NEPAD might want to invest in, actions to undertake in order to meet minimal conditions. 3) Institutional arrangement for countries to engage in the suggested initiatives.
- 5.2 It is necessary to look at the conditions under which African countries can collectively engage in scientific and technological development.
Minimum conditions for S&T cooperation:
- 5.2.1 Nations need to build confidence in their own ability to develop scientifically and technologically. The current approach is not focused on endogenous technologies or developing own capacity to develop S&T. The focus tends to be more about technology transfer and adoption from outside.
- 5.2.2 Norms and rules to guide collective engagements. Diverse countries bring different comparative advantage to NEPAD and are starting from different levels. It is important to have some protocol to inform regional S&T initiatives. The experience in Africa and elsewhere has been that the lack of norms and rules kills initiatives. It will be useful to consider an S&T protocol.
- 5.2.3 Creation of centres of excellence. Forming a network of institutions to mobilise technical, human and financial resources. This will require determining how the institutions with significant ability in important areas would be identified.
- 5.2.4 Ability to make transition from doing science for science's sake, to science for economic purposes. Science needs to be linked to the market place, and involve engagement of industry and the private sector. It should have the flexibility to move and operate in the economic domain.
- 5.2.5 Flexibility to build new capacity, e.g., in genomics. Promote capacity building and have explicit links to training institutions, especially universities.
- 5.2.6 Funding. Most countries have not made the 1% of GDP for S&T target. Few that have moved closer are also questionable in terms of the quality of investment (i.e., whether they are investing in strategic areas). What kinds of financial resources are required? What are the target areas for investment? How can financial resources be mobilised? What kind of financial instrument is required? How will it be governed?
- 5.2.7 Clear focus on the policy and ethical questions associated with emerging technologies, especially biotechnology. In the absence of a shared position, countries are unlikely to collaborate in emerging technologies. Different perceptions and expectations exist. It is necessary to harmonize policies and bio-safety measures.
- 5.3 Political commitment and capital for S&T must be ensured. It is critical to have political champions for S&T. Political institutions make decisions on financing, investment focus areas, etc. It may be necessary to have

awareness-raising sessions, e.g. for MPs so that they can start making important commitments to S&T. Many countries do not have parliamentary S&T committees. It may also be necessary to create outreach mechanisms to bring politicians into the process.

- 5.4 Public, civil society, and corporate sectors have fairly limited confidence in the science enterprise. It is seen to be closed. The challenge is to open up and create a public understanding of science and expose the kinds of innovations being developed. Opening up the science enterprise will include a role for media and existing media processes in getting the world and key sectors to know that S&T is being conducted.
- 5.5 A proposed process to establish towards achieving these objectives:
 - 5.5.1 Develop a mechanism to mobilise best African expertise that we have. Consider putting together a panel or working group of eminent African scientists to give the sense of an agenda, and what is possible / not possible. Such a panel should be knowledge-intensive and utilise the best expertise on the Continent.
 - 5.5.2 Establish an open, broad-based, inter-governmental mechanism of those who are responsible for making policies, e.g. a committee of senior government representatives. This grouping would review and approve the recommendations of the experts. It should have linkages to the highest levels of political governance; perhaps it should be at the ministerial level. There is learning to be gained here from the Environment initiative whose issues have been debated at the ministerial level.
- 5.6 Principals that should guide in moving forward:
 - 5.6.1 Don't reinvent the wheel. Build upon prior progress and existing initiatives.
 - 5.6.2 Recognize differentiated capabilities. Do not intimidate countries that are not scientifically advanced.
 - 5.6.3 Take an evolutionary approach. Create processes to learn. Ensure ownership by stakeholders (industry, civil society, etc.). But also develop timeframes to ensure progress.
 - 5.6.4 Learn from others. There are a number of existing regional S&T initiatives such as ERA and OCED. Understand their experience, and learn from mistakes.

6. Issue Paper – Science and Technology: Lessons and Outcomes from World Summit on Sustainable Development (WSSD)

Dr Rob Adam

Chief Executive Officer, Department of Science and Technology, South Africa

- 6.1 Presentation of the WSSD and the sources and types of commitments feeding into the Workshop. The WSSD presented a great number of opportunities to offer expression to the S&T issues raised at the Workshop.

The Summit placed responsibility on all nations to implement national, regional and global responses to five priority areas, i.e., water, energy, health, agriculture and biodiversity. S&T is pivotal to all these initiatives, and S&T is clearly indicated in the Johannesburg Plan, and in the Plan of Implementation which is the means of implementation, global partnership, etc.

- 6.2 The S&T debate at the WSSD included advise for decision-making, improved access to developing countries to S&T platforms, HRD and brain drain (including issues of financial support), IPR, ICT for development, and transfer/ application of clean technologies.
- 6.3 The concluding ministerial session of Science at the Summit produced the "Ubuntu Minute" which is a developing country political commitment to harness S&T for sustainable development. It is important that a high-level developing / developed country political commitment be present to harness S&T for sustainable development.
- 6.4 WSSD's endorsement of S&T as a priority instrument for development has significantly advanced the "S&T for development" agenda post-WSSD.
- 6.5 There are still a number of challenges to be addressed – bridging the gap between existing needs and the resources required; securing support through a sustainable global effort, especially financial, for S&T capacity-building in the developing world; eliciting an improved response from the scientific community to challenges of sustainable development; north-south collaboration and partnerships,
- 6.6 WSSD was an important milestone as African / international commitment to S&T for development. Its outputs should be considered and integrated with a NEPAD framework for S&T.

7. Plenary Discussion: First Plenary

Respondents:

RA – Dr. Rob Adams
JM – Dr. John Mugabe
WN – Prof. Wiseman Nkuhlu
ABT – Prof. A. Babatunde Thomas

- 7.1 (RSA) It is vitally important to clarify and agree upon what we mean by "centres of excellence." There are different models for what people think.
 - JM: May be useful to agree on key features of agencies we consider to be CoE, rather than defining. A lot of time and resources have been spent already trying to define CoE (by UNDP, etc.). Let us agree on the features and agencies likely to meet such objectives. E.g., their relevance of mission, existence of a critical mass of scientists, tangible outputs (patents, innovations, new products / process, quality of publications, at cutting

edge, link to industrial development), pronounced demand for services, etc. It would be difficult to come up with a definition.

- 7.2 (UNESCO) What is expected to be the status of output from this Workshop in the context of NEPAD? If the Workshop title is presumably the goal, are there subsequent stages before a framework is developed, or will the Workshop outputs be plugged into the document?
- WN: Referred to process. One of the outputs from the Workshop is what the process should be. How do we extend participation and make sure that we have a credible and legitimate process that represents broad views? There are options to adopt existing processes, or, where there isn't an internationally agreed programme, it is possible to take the initiative. NEPAD expects to be advised on the process. There are steps to being a NEPAD-approved programme of course; political buy-in is necessary to make things happen, especially because participants will have to commit resources.
 - WN: On the matter of NEPAD and the international community, it behoves Africans to educate themselves. There have been many conferences and opportunities for discussion (ECA, ADB, conferences of ministers of finances, AU civil society forum, AU summit with labour, WSSD, etc.). The need is now to drive programmes at country or programme level. It is time to give substance to NEPAD now and accelerate the pace of development. NEPAD is not mobilising funds for itself; funds need to go to the national governments to implement their programmes. It is necessary to develop political will and pressurize African leaders to make and meet their commitments. Acceleration, facilitation, energizing, and transformation are key.
- 7.3 (Uganda) (i) Necessary to explain NEPAD as a pledge, strategy and framework; this would help to clarify what NEPAD is all about. Uganda already thinks that NEPAD is a source for money, and therefore say it is failing. This is just a matter of explanation. (ii) On the nature of institutions being proposed by JM; there is a need for institutions that create operational flexibility, e.g., for young scientists to progress and increase capacity for S&T. Otherwise we lose capacity in partnership. (iii) How much money do we spend? Not even so much how much money, but where the money goes. Issues of corruption come up. Need to develop strategies for tapping monies effectively, e.g. oil rich countries. (iv) On partnership, north-south partnerships are required, but sometimes this contributes to losing the capacity we are able to produce thus contributing to brain drain. Important to consider and emphasize south-south cooperation more.
- JM: On funding, the issue is not so much the amount of money. E.g., countries like Brazil and China have made very small investments in biotechnology, but have targeted investment in the focus area with great success. There is also a need to balance between a research agenda and other development aspects.
 - RA: Yes, but north-south partnerships are also important. On funding –both focus and quantity are issues when it comes to spending. Percentage of GDP spent of R&D is important and not contested any more.

- ABT: Experience in Nigeria is showing that it is important to look across the government when trying to identify spending level; it is misleading only to look at the number of projects or funding going through the S&T Department alone. Other ministries also have to do with S&T and R&D. The exercise currently being undertaken in Nigeria when completed may help to clarify the issue of financing and policy linkages.

- 7.4 (RSA) Scientifically related issues and frameworks should be distinguished from technology issues which are closer to market. If CoEs are the ones that are close to the market place, how does one set up CoEs of that nature in Africa where much of market activity is by multinationals which do much of their own research activity elsewhere?
 - JM: New technologies are science intensive. In the 70s we were told that we did not require hard research – we needed applied research. We have suffered as a result of this. Would argue that more investment needs to go into science than technology (hardware components).

- 7.5 (RSA) Any ideas as to how one creates the imaginative and intelligent north-south networks? A lot of instruments like 6th Framework begin to do this.
 - RA: A number of mechanisms come to mind. It is a question of getting focused.

- 7.6 (Nigeria) An item that is missing is education. Are we teaching children the right attitudes that will lead to innovation in S&T? Are universities developing the right curriculum? We have to focus on aspects of instruction.

- 7.7 (Nigeria) A great deal of information already exists worldwide and does not require research. De-emphasize research and use existing knowledge as much as possible – indigenous and otherwise.

- 7.8 (Algeria) On CoEs, need to address two issues. (i) An information system is needed on a continental level which captures institutions, manpower, etc. (ii) It is necessary to identify within a shared vision what we consider to be priority areas and domains. Establishing a link between these two will help to take us closer to what we mean by a CoE.
 - JM: Important that we build our sense of what our capabilities on the Continent are – institutions, research capabilities, relevance, etc. This should be discussed further as an important aspect. This also relates to the brain drain question.
 - RA: Good idea. Also look into the Diaspora – expatriates at other international institutions who can still be used as resources.

- 7.9 (RSA) On the approach – what about a more holistic approach in terms of building a national system of innovation (NSI)?
 - JM: This is on the level of trying to possibly develop a regional innovation system. It is not one that emerges in the absence of NSIs – it builds on them. This is why the document proposes that one cluster of activities should be building an understanding of the NSIs. Do they exist, what are the weaknesses, and so forth.

- RA: A lot of work is being done on scale dependence of NSIs. Have to make an explicit linkage between academic institutions and companies that are globally competitive. CoEs can happen by themselves.
- 7.10 (RSA) Has been involved in a study on mobilising expertise. Can build expertise through their model, north-south and south-south, and ensure that particular projects through NEPAD Secretariat or nation states can access experts within countries and continentally.
- 7.11 (Nigeria) So far have been emphasizing areas of need. Should cover other areas as well.
- 7.12 (RSA) Importance of mobilising not only the practitioners of science, but also users of science. When talking about building political capital, this would be done by demonstration or deepening appreciation by fostering greater understanding. Need to target not only politicians, but also their constituents (civil society, labour) from whom they get their mandates. Need to build a robust constituency.
- 7.13 (Egypt) Presented idea of building focus on flagship projects. This would be a way to raise awareness of public and interest of politicians by indicating positive delivery of something concrete. Interested in WSSD outcomes as a way to adopt a project (e.g., in agriculture) serving NEPAD sectors and also raising interest of northern institutions and countries to become involved because it would be added to the results of WSSD.
 - RA: Flagship projects are a good way to build interest of politicians and stakeholders. But need to make sure that the flagship is not the only thing happening – can be seen as elitist and not connected to the NSI. In a country which has not traditionally valued S&T sufficiently, flagship projects can be key. It would also allow pulling in of younger people, and draw in other capabilities (e.g., satellite technologies and agriculture).
- 7.14 (RSA) Noted omission of gender in the presentations. Would like to see gender incorporated into NEPAD framework. It is important that women are developed in the context of child development, and also that they are looked at within the research agenda as beneficiaries (improving their quality of life and moving them away from them being the bearers of poverty). Involvement of women in technology-intensive industries is also important.
 - JM: Had attempted to refer to gender and the contributions of women in the document that was circulated. The comment has been made that there is a need to move away from focusing on the impact of S&T on women, and rather consider the role of women in S&T.

Country Perspectives on S & T for NEPAD

*Dr. M. Orkin (Facilitator; for Dr S Chandiwana, Zimbabwe)
CEO, Human Sciences Research Council, South Africa*

8. Algeria:

Dr. M. Berrah

- 8.1 Algeria is totally committed to NEPAD and is convinced that S&T is integral to the development of the continent. S&T is seen as a strategic priority in Algeria's higher education system, and the country has dramatically reconstructed its S&T milieu to be able to address national needs.
- 8.2 Its objective nationally is to develop sustainable development to ensure a better quality of life for all Africans. To reach this goal an action plan is required that reaffirms the strategic character of S&T, but also within the framework of an integrated conception (sustainable development).
- 8.3 Priority research areas are ICT (which is broadly accessible), valorisation of research results, encouragement of strategic partnerships (bilateral and multilateral cooperation). Biotechnology has been supported extensively. Water management and energy are also crucial.
- 8.4 Algeria has a programme that encourages start-ups in universities, engineering schools and SMMEs. Partnerships are encouraged in Africa and developed countries.
- 8.5 The challenge on a national level is the need to satisfy growing needs in terms of qualitative manpower in order to keep up with economic and social development.
- 8.6 The challenge at an international level is the importance of being part of the development of S&T, e.g., accomplishments in ICT, and smooth integration in terms of globalisation.
- 8.7 Agree that the profile of S&T as a strategic tool should be raised in the context of NEPAD. As a plan of action, the following are suggested:
 - 8.7.1 Africa must have a database / information system through which to create a clear idea of what our university systems and research centres look like. This system must provide a broad perspective of skills based on certain themes.
 - 8.7.2 Identify strategic or priority domains and programmes that will be part of a shared vision for the Continent. This will lay a foundation for what can then be called centres of excellence. Ideas for suitable areas include ICT's, biotechnologies, spatial sciences, water management, and energy
 - 8.7.3 Create CoEs
 - 8.7.4 Make use of certain countries in terms of their expertise in S&T
 - 8.7.5 Create smart or intelligent technology transfer
 - 8.7.6 Network universities (exchange curriculum, human mobility, resources, experiences, etc.)

- 8.7.7 Create an African Foundation for S&T that funds CoEs, research priorities and human mobility, and also interacts with the funding community.
- 8.7.8 Elaborate a strategy towards the African Diaspora; how to mobilisation of them (e.g., through virtual research centres)
- 8.8 In conclusion, S&T should be seen as a strategic tool for NEPAD, this requires commitment of the states, and there is a need for a coordinating instance that would follow the implementation of this programme

9. Egypt:

*HE Ms H Islambouly
Egyptian Ambassador to South Africa*

- 9.1 Proposition on how to build upon capacities that are there in the continent, and how to build capacities that are not there: use a project-oriented approach. This was the focus of different areas of the NEPAD initiative on the whole.
- 9.2 The issues of networking and CoEs are also of great importance on the Continent because NEPAD is about creating integration in Africa as seen in other parts of the world (Asia, Latin America) – the process of global integration.
- 9.3 The question is how to integrate a research project across different centres in Africa – say as a flagship project. Agriculture is perhaps one such area because, for example, it is possible to do a project in the desertification area which would cut across Africa, and states would be interested. Agriculture as an option also goes back to the presentation given by Dr. Rob Adam on the WSSD. There is an instrument in desertification which means that financing is available in, e.g., from GRF and the World Bank. Have to work together to build a network and CoE for Africa in this area of desertification. Findings can be circulated around the world and promoted to end-users around the world. It is useful to note that China already has a good research programme in this area as well.
- 9.4 The idea of networking all universities and research centres on continent, and the idea of an inventory of S&T on the Continent are good. But there are also a number of other existing endeavours e.g., G15 (NAM) which need to be coordinated and harmonized.
- 9.5 Current initiatives in Egypt include the Academy of Science, and clusters of councils in S&T (specialised centres, e.g., in space, mineral technologies, agriculture, etc.). Other areas of research proficiency include health, oceanography, fisheries research, electronics, and ICTs. Biotechnology and bioengineering studies are also making great strides. Egypt has a law relating to safety in genetic area.

- 9.6 On pooling of resources, inside and outside Africa, the Diaspora is a very important point. It is necessary to link into African expatriates around the world because they can be a locomotive for African research.
- 9.7 What is achieved should be felt by the people and should be visible throughout the countries, thus it is critical to take a project-oriented approach. The common man should feel that something was done through NEPAD to better his life.
- 9.8 The format that has been adopted is built upon regional economic communities (REC). But regional groupings are not at the same level in different areas, and it would be a shame to leave others behind. Especially in S&T, many African countries need capacity building and HRD in S&T. A country like Egypt has a centre for agriculture hosting 5,000 PhDs. They would like to share this resource with Africa and world.
- 9.9 There are many financial instruments globally and regionally. In order to benefit from them, Africa must take a cost-effective approach. NEPAD should be careful not to take up a range of uncoordinated mini-projects which do not tackle any of the problems that Continent is suffering from. Countries need to collaborate to ensure that the projects undertaken have a greater impact.

10. Nigeria:

Dr. Timothy Obiaga

Director General, National Agency for Science and Engineering Infrastructure

- 10.1 While there are may be negative issues relating to globalisation – e.g., political globalisation may mean a few countries dominating the political scene – technological and scientific globalisation are surely good for the world. Africa must look at globalisation issues from a positive point of view and seize the opportunities, no matter what the arguments are.
- 10.2 There are areas of principal concern in world science (including energy, environment, shelter, communications) and there should be principal areas of research to solve these problems.
- 10.3 Developed nations undertake active research in a number of fields, including non-oil sources of energy (water, alcohol, etc.). The implication for Africa could be that it ends up importing those technologies and sitting with “a bag, but nothing in the bag” – e.g., crude oil. There is a need for Africa to come up with a blueprint for the post-petroleum age. A new paradigm has to emerge based on a science agenda which is totally from an African perspective. There should be clear objectives around sustainable socio-economic development, capacity building, and S&T. The tools would include biotechnology, ICT, energy, etc.
- 10.4 The essential elements for an African science agenda include political will and vision, well-defined national S&T policies, integrated capacity

building, mass education (formal and informal, secondary, technical and tertiary), and strategic partnership emphasizing south-south partnerships.

- 10.5 Nigeria has made progress in certain essential components of the science agenda. This includes:
- In space science, Nigeria has a policy which has led to the establishment of the National Agency for Space Science and Development. A micro-satellite built by Nigerian scientists in a cooperation with numerous countries will be launched in July 2003 by Russia, the purpose of which is remote sensing to look at resources in Nigeria.
 - An ICT policy has been put in place resulting in the Nigerian National Information Technology Agency. The objective in this area is to mobilise the populace to understand and begin using ICTs in all aspects of their lives. There are creative solutions to getting the Internet to remote populations.
 - A policy in biotechnology resulted in the establishment of the National Biotechnology Development Agency which will tackle issues of food, health, etc. for improving the quality of life in Nigeria.
 - Nigeria also has a Centre for Nuclear Energy Research. This is to be used in support of agricultural research.
 - A policy on SME has been tabled to regulate and help to introduce technology into the work of SMEs. An SME Development Agency is to be developed under the Ministry of Industry.
- 10.6 In conclusion, the key requirements are political will and vision, well defined policy, education, integrated capacity building, and partnerships at all levels.

11. South Africa:

Dr. B. Tema

*Acting Group Executive, International Co-operation and Resources,
Department of Science and Technology, South Africa*

- 11.1 South Africa supports the emphasis on political will to ensure that S&T initiatives gain support. Quoting former president Nelson Mandela (1996), "Our new government recognises science and technology as a major pillar of the reconstruction and development programme. A nation's commitment to S&T is often an indicator of its stage of economic, social and cultural development."
- 11.2 South Africa's S&T policy is focused on promoting competitiveness and job creation, developing human resources, enhancing quality of life, promoting the information society, and working towards environmental sustainability.
- 11.3 The policy foundations as articulated in the National R&D Strategy are building a strong S&T base and providing infrastructure / core capability; furthering economic development; addressing problems of the poorest;

strengthening the S&T base and the benefits derived from the country's resources base; and increasing and improving research technology cooperation across the region and continent.

11.4 There are a number of challenges facing S&T in NEPAD. Key is the need to raise the profile of S&T and make it contribute to sustainable growth. It is a problem to have high levels of science and technology among a population that is still dying of basic things like cholera. Awareness and understanding need to be raised, S&T needs to be seen as a tool and not as a reward, and partnerships need to be built with developing countries as well as interfaces with the developed world

11.5 The following propositions are offered in support of NEPAD:

- African countries should raise their R&D national investment to a 1% target within set timeframes.
- African governments should use own budgets to introduce new technologies and kick-start demand. This should not just be technology transfer as passive recipients, but the active development of new technologies.
- Regional centres of excellence around S&T linked to issues relevant to NEPAD. This should involve partnerships between countries with shared technology needs. Excellence can also be contextual – e.g., addressing a health concern in a particular country.
- CoEs should offer specific targeted technology demonstration and extension services linked to higher education institutions so that the benefit is felt on the ground.
- Mechanisms should be developed to reduce the net loss of African skilled personnel to the developed world. This includes ensuring stable employment in S&T CoEs.
- Promote S&T in education and social environment. Engender a culture of innovation from an early age, e.g., increasing Math and Science enrolments to exceed 5% within 5 years. The currently level is less than 3%.
- Resources, including global research resources, should be targeted to the following proposed areas:
 - Biotechnology for food security
 - Water supply purification, use and delivery
 - HIV/AIDS vaccine and treatment and prevention of other communicable diseases
 - ICTs for Africa development needs
- African R&D should be promoted for its spin-off effects. Development partners could support S&T in Africa through multilateral R&D programmes in relevant areas, and ODA should include a focus on knowledge generation and innovation capacities.

11.6 In conclusion, there is a need to pool resources regionally, continentally through NEPAD, and internationally.

12. Plenary Discussion: Second Plenary

Respondents:

BT – Dr. B Tema, RSA
TO – Dr. Timothy Obiaga, Nigeria
MB – Dr. M. Berrah, Algeria
HI – HE Ms H Islambouly ,Egypt
MO – Michael Orkin, Facilitator

- 12.1 (RSA) Is there a need for an African space council like that in the EU?
- TO: Should be taken up by HOS. A good idea.
 - HI: Raises the question of whether we have enough agencies in Africa already. A diplomatic view would be to ask whether we need another new structure. Preferable approach may be to explore how to link the different institutions / councils on S&T to network on the area, but scientists must decide on this.
- 12.2 (RSA) Increasing target of Math and Science students to 5% is too modest, even if realistic. Do we not need a more radical reaction?
- BT: Yes, the target is modest. Kick it up.
- 12.3 (Nigeria) With regard to stopping the brain drain, also need to ensure that we can find mechanisms for using the brains. NEPAD should look into this.
- 12.4 (Nigeria) The issue of the databank seems to focus more on getting information about the expatriates. There is a need to have an audit of facilities, research areas, etc. – not just manpower. Duplication of efforts exists within countries. Collaboration is facilitated by knowing what others are doing.
- MB: It is important to establish the landscape.
 - MO: May be an opportunity to do this in a sound-byte way. There have been examples presented at other venues, e.g., of the negative impact on R&D spend.
- 12.5 (Nigeria) The space council notion is a good idea for peaceful collaboration. Should look at regional aspects in order to put together critical institutes and research centres. This will bring us closer to defining CoEs because they will begin to define themselves.
- 12.6 (RSA) Should make assumption in NEPAD that there is strong capacity in Africa that needs to be mobilised. Strengthen the strong and improve the weak to make the system for S&T more robust.
- 12.7 (RSA) CoEs that can serve the whole continent should be the focus, e.g., desertification as a theme. Need to identify a small number of strategically focused CoEs to show how S&T contributes at the level of the continent. Regional CoEs have only worked globally when they connect to national

infrastructure. It is important to be careful in this regard, otherwise the system could foster a sense of disempowerment at a national level.

- 12.8 (RSA) Disagree on the focus on the Diaspora. The challenge is to increase national expenditure so that people don't leave in the first place. They see must see a career future in our countries linking to S&T. Otherwise Diaspora brains are not available to us (at least not for more than a very short time). So, first, stop the diaspora effect through strategic investment in S&T. Then retain remaining people and try to attract back.
- BT: Yes, it is key to retain our people. Some do want to come back, but can we house them? Need to get the house in order to be able to attract them back.
 - TO: Need to put more money into S&T / R&D. South Korea did a good job in this area. They created an environment for their nationals to come back from the USA and earn almost as much in Korea as they were earning internationally. There were also strategies for existing students where graduates from the S&T institution were exempted from national services and automatically earned higher salaries than those from other universities. These strategies were effective in attracting experts back as well as retaining them in South Korea.
 - MB: It will not be easy to create a competitive environment for experts in the Diaspora, but there are those who do want to do something. There is a need to organise something for them, even if it is for them to contribute from where they are.
- 12.9 (UNESCO) NEPAD should lead us to do things differently in the future. Do the country representatives see that NEPAD presents feasible ways to do things differently in the future in ways that, e.g., the Lagos Plan of Action did not?
- BT: We should be learning from mistakes, therefore creating possibility for improvement. But also, when you compare 60s to our present moment, we are in a moment where Africa is relieved from a divergence in what we are supposed to (having come out of the cold war, isolationism, etc.). We can now define do-ables – beyond just verbal inputs – and there is now money to kick-start bilateral and multilateral programmes, e.g., the African Laser Centre.
 - JM: The question is how to we make NEPAD offer those opportunities. How do we make sure that we develop the conditions and momentum through political engagement?
- 12.10 (Nigeria) At the level of NEPAD norms, should these be implemented at state level (decision-making level) or at federal level?
- TO: Decisions are taken at both federal and state levels [in Nigeria]. Since states can decide on their school curriculum, they can also take S&T decisions. Research institutes and ministries have also been established at state levels. A range of other ministries at both state and federal levels (not necessarily called S&T) may also be doing S&T and allocating funding for S&T.

- 12.11 (RSA) There is the example of the SANSA (South Africa Network of Skills Abroad) programme which is trying to track down and use skills abroad. Although it is still at its early stages, it may perhaps offer an example of how to build a network.
- 12.12 (RSA) How far have countries gone in developing expert databases? The Institute for Scientific Information has put together a community of science database on the Web to which many in RSA are already submitting their information on a pay-for-use basis. It is an example of how you can update the expertise database, and it is easy to extract expert groupings / communities. The ICT is available do this. There is a need to pull resources together and look at examples from around the world. Undertaking an audit of what is to be achieved may also be useful.
- MB: This sort of exercise is important, and is in underway in Algeria.
 - HI: Egypt already has a database that includes dissemination of documentation, resources, bibliographies, scientists, and research areas.
- 12.13 (RSA) How can it be ensured that S&T reaches all the key research target groups?
- MO: S&T is a necessary, but not sufficient, condition for pro-poor development.
 - TO: The question is how can S&T reach the people. There are examples from Nigeria, e.g., of using technologies to rehabilitate and reuse discarded equipment and items. Such efforts should be complemented through formal education.
 - JM: S&T and social values should be part and parcel of each other. The question is how we make the poor part of S&T so that they are roleplayers, and not just recipients, of S&T. The laboratory is not the source of innovation; innovation comes from the field / households.
 - (RSA): There are a number of keystones we can build upon. JM's comment on including the poor in innovation is one. Also, nobody disputes that S&T has a positive impact on wealth creation. It is necessary to persuade development economists that S&T has an impact on the rate of development of economies. Development agencies do not appear to believe in S&T and its contribution. The social sciences need to be educated on the new economics and mainstreamed into the development paradigm. Also the NEPAD programme attacks poverty from national and regional perspective – it doesn't tackle household poverty. We have to be able to demonstrate how the NEPAD programme will translate into addressing household poverty, e.g. through stimulating education. Workshop has not talked concretely and specifically about how S&T brings knowledge to households more quickly and effectively.
- 12.14 (RSA) What is the role of the social sciences in ensuring that innovation / S&T benefits society and the poor in the manner envisaged?
- BT: Collaboration is currently not taking place at all with the social and natural sciences. Not enough value is placed in understanding the context, e.g. how / why some people keep getting infected through

water. Understanding this can help in addressing problems in a scientific way.

- MB: It should be an integrated approach. Social sciences are very important and should be seen in a complementary – not competitive – view. It is important to see what are the trends are, e.g. in engineering curriculum. It may be important to have social science inputs in this regard.
- MO: Concept of "social technologies." Social sciences are also important in considering the prevention aspects of HIV/AIDS; what motivates people – how they think, behave, understand, and undertake sexual relations.

12.15 (RSA) A point about the role of S&T in development and competitiveness has been made. What is the thinking in terms of mechanisms for linking S&T into the other priority areas in NEPAD?

- BT: S&T is indeed a cross-cutter. It is expected that there would be coordination with the sectors to see that programmes being developed are not duplicated.
- JM: May want to consider tracing the initiatives that have been developed by NEPAD so far (e.g., Agriculture, Peace and Security, Environment) to assess the S&T content already present in those initiatives. What are the S&T issues already integrated in those papers? Should focus on mainstreaming science in those initiatives.

12.16 (Algeria) What is the status of TOKTEN [in Nigeria]? Would like to learn from the experience.

- (Nigeria) Believes that there should not be an over-focus on TOKTEN. There have been challenges, e.g. around interfaces in that the highly advanced infrastructure that is required in order to operate effectively is not in place in Africa. Would support a strategy to encourage people in Diaspora to come back permanently, but not to come for short periods of time and go back.
- TO: The shortness of time was also a factor. Not much can be accomplished in a period of say 3 weeks. If the programme were to be done, it would require to be for longer durations – at least a year or so.

12.17 (RSA) People are saying that the war on Iraq will affect Africa even more than the two countries fighting. The question raised was why. Do we not have scientists in Africa can protect us? Why should a war elsewhere impact on us so much. What is the focus of African scientists and technologists? What is the S&T community trying to address? The four presentations are making some justification of what we are supposed to do as justified by someone else elsewhere. The Workshop needs to be able to say that the S&T community is going to do this and this to protect Africa.

- MO: Old proverb "when elephants fight, the grass gets trampled." The problem is that when elephants make love, the grass still gets trampled.
- TO: There was a incident where the suggestion was made that the best thing to do is to banish all scientists to a remote place and let them play. One has to wonder whether our developed country counterparts would make such a comment; believes they wouldn't.

- 12.18 (RSA) There should be a concern about the duplication of projects, even at national level. There are examples in South Africa where many organisations are involved in the same area without communicating, e.g., in biotechnology.
- 12.19 There is a need to look at the involvement of youth in technical fields – have more learners doing maths and sciences. There should be programmes to ensure that learners go to school and take these subjects. Students who are doing core sciences also need to be retained. Many of them within one or two years go out of research and into other management areas (finance, etc.) usually because of lack of immediate satisfaction in S&T.

13. Closing

Professor A. Babatunde Thomas

- 13.1 Issue of mainstreaming S&T in NEPAD must be looked into. Africa has a history of not being able to steer the course of the most major development decisions and programmes that were agreed on, e.g. being straggled with Structural Adjustment Programmes. Washington would come in and all existing decisions would be abandoned and replaced. S&T is one of the areas that suffered the most. In [development] debates, the issue of S&T never features, or is never sustained. One of the reasons why is that when we sat to discuss macro-economic policies with the Bretton Wood institutions, we never linked in or talked about S&T. One of the challenges ahead of us is to reflect upon the appropriate type of framework that we need to put in place to make this linkage (between macro-economic policy and S&T) possible.
- 13.2 When one looks at stories such as that of a government official saying in reaction to a proposal for budgetary allocation for S&T, "here we are suffering from food security, and you are talking about biotechnology," one realises the challenge we are facing.

International Co-operation in Science and Technology: Implications for NEPAD Presentations

Dr. Mandi Mzimba (Facilitator)
Council for Geoscience, South Africa

1. International Development Research Centre (IDRC):

Dr C Freeman,
Regional Director, IDRC

- 1.1 Many of the themes discussed at the Workshop are those embraced by the IDRC whose original emphasis was on science before the Centre expanded into different fields. Key to their approach is funding initiatives that are initiated and driven by local people and that add to capacity building.
- 1.2 The IDRC is only allowed to spend 18% of its budget on Canadian research and the rest is spent on Africa. The Centre also promotes devolution, i.e. helping to mature its programmes and sending them out to the people. The African Technology Policy Studies group has evolved from the IDRC and has become an autonomous agency, which indicates that Africans are working independently.
- 1.3 IDRC now has a strong focus on research and policy. It refers to making research active, and closing the loop between. In addition, key to this is promoting networks, centres of excellence and alumna.
- 1.4 The link between research and policy is emphasised, i.e. making research active with policy makers. The loop between the research and policy should be closed, not just with policy, but also with practitioners and people. It is not enough to deliver results; it is also important to work out systems to make the research relevant and to present it in a fashion that is usable to people.
- 1.5 Networking is an important IDRC component. The Centre's programmes are multidisciplinary, networked through ICT linkages to span the globe. Networks between partners are promoted vigorously in areas such as trade, ICT, and environment, involving institutions as well as individuals.
- 1.6 Centres of excellence can be translated into virtual centres of excellence to link the Diaspora to the initiatives in Africa. In this way, the problems of culture and infrastructure can be solved.
- 1.7 An alumni network in this region is something IDRC is currently working on. People in managerial or power positions lose time to read. When they need to find information or expertise they call a friend.

- 1.8 Examples of IDRC programmes that link into the S&T aspect:
- Research on knowledge systems
 - Research competition
 - National research reviews
 - Biotechnology programme
 - Working with journalist on science and technology
 - African Technology Policy Study group (ATPS)

2. United Nations Educational, Scientific and Cultural Organisation (UNESCO):

Mr P Vitta

Director, Regional Office of Science and Technology, UNESCO

- 2.1 UNESCO is a peace organisation. The first sentence of its Constitution says that since wars begin in the minds of men, the defence of peace must be constructed in the minds of men. Education, culture and science must be developed to reach this goal.
- 2.2 Since UNESCO's origins, it has changed focus. Originally the organisation dealt with natural sciences, which has been expanded to include social and human sciences, as well as communication and informatics.
- 2.3 The areas in NEPAD that present opportunities for collaboration between the African region and UNESCO:
- 2.3.1 Peace and security is a precondition for development. This goes for democracy as well. For example, Angola is rich in natural resources, but because it has been enmeshed in war since 1975, it has become impoverished. A UNESCO programme under social human sciences, known as Management of Social Transformations (MOST), is addressing democratisation in this country.
- 2.3.2 Sectoral priorities are also part of UNESCO's activities, e.g. human resources activities, bridging infrastructural gaps, narrowing the digital divide by promoting telecentres and multimedia centres; culture, etc
- 2.4 What has UNESCO already done and what can it do in the future? The education initiative undertaken by UNESCO in Africa was abandoned because of lack of resources, but it can be revived if NEPAD feels it will be useful. Networks established years ago still exist, and new ones need not be established. ANSTI (African Network of Scientific and Technological Institutions) exists as a network that can be used. A publication is available explaining what it does and what the benefits are. A directory of women engineers is also available.

3. European Union:

Dr M Pletschette

Directorate General Research, European Commission

- 3.1 The European Union (EU) has been disbursing funds over last 20 years on North-South collaboration in S&T. However, the contribution of Africa in the global economy has been declining steadily. If this trend continues, there will be no involvement of Africa in the global economy in 15 years time. There is universal consensus that the growth of Africa has to change its pattern and it must rely on a strong base of S&T. The EU therefore has to increase its investment in S&T in Africa.
- 3.2 EU R&D funding targets are 1% of public spending from all member states, and 2% of private spending, but it has been difficult to realise these targets.
- 3.3 There is remarkable parallelism between concerns of African and European heads of state. Research will not be about giving money to researchers, but about the production of intellectual property. Those that do not deliver will not have a role in research.
- 3.4 Social and natural sciences should be merged so as to take the social element into account in the field of hard science.
- 3.5 There is no such thing as partnership if there is no equal distribution of work and responsibility to encourage learning and positioning. North-South collaboration has not been receiving many projects lately. There is lack of skill and capacity, therefore meaningful North-South collaboration cannot continue. This means that these two aspects must be improved. The S&T agenda must come up higher in international debate.
- 3.6 The European Development Fund has done little to promote S&T on the agendas, but the issue is being reviewed.
- 3.7 The conditions under which technology and science are transferred must change drastically. An entire production line cannot be dumped on a community and then left to its own devices. There must be long-term support and maintenance. Technology transfer must be replaced by technology cooperation.
- 3.8 The main financial and political instrument is the Framework Programme (FP6) comprising €17 billion. €13 billion will be spent on African projects; €3 billion on coordination and some on mobility. €600 million will be offered to involve non EU Researchers. The function of FP6 is to integrate EU research. With regard to the components of this integration, instruments have been simplified, i.e. instead of four or five partners, funding will be targeted at projects with 15 partners.

- 3.9 The second instrument is a network of excellence. A team needs to prove that there is reason to fund its network and the work programme must be shared by all the centres.
- 3.10 Another component of the FP6 is the allocation of €15 million to be spent in Africa on water and energy initiatives.
- 3.11 Proposal for the development of a NEPAD S&T framework:
- Benchmarking, i.e. common qualification or starting point
 - Mapping of excellence (structure HR – still too much overlap)
 - Highly competitive research and development information system – <http://www.cordis.lu> (R&D information portal)

4. Inter Academy Council: Mobilising the World's Best Science

Dr. Albert W. Koers

Executive Director, Inter Academy Council

- 4.1 This organisation was established 3 years ago to support the world's leading national academies of science (about 80 in number). Its purpose is to provide S&T advice for informed decision-making on global socio-economic concerns such as S&T capacity, food security and safety, etc.
- 4.2 Ongoing studies cover agricultural productivity in Africa, promoting worldwide science and technology capacities and transition to sustainable energy, amongst others.
- 4.3 The presentation was the result of a study on promoting Science and Technology worldwide. It included a demonstration of how to move from ideas to impacts:
- Attract and retain young scientists
 - Build national and centres of excellence
 - Establish web-based networks of excellence
 - Establish public/private partnerships
 - Strengthen links with expatriate scientists
 - Develop national S&T plans
 - Invest in education
- 4.4 This report may be of use to further the aims and ambitions of NEPAD.

5. French Ministry of Foreign Affairs:

Mr Pierre Colombier

Deputy Director Research, France

- 5.1 On French research and development in Africa, substantial funds are available to support initiatives in the area of cooperation with Africa in devising priorities for R&D.
- 5.2 The state of S&T in Africa has been captured in a recent publication and it is evident that the state of science differs substantially from one area to another. This report is available on the 'Net if required.
- 5.3 Four objectives of French policy supporting research in Africa:
 - Strong emphasis on training: Mr. Colombier said that excellence should be a step-by-step approach. It could start with seminars and training sessions. Older established scientists would train younger researchers.
 - Support research teams in the South
 - Consolidate the teams and make them visible at the international level.
 - Invite teams to participate at an international level once recognition has been obtained.
- 5.4 A Solidarity Priority Fund has been devised for AFRICA (€100 million available for research programmes). Emphasis should be placed on social sciences. Research programmes cover fields such as agriculture, water, biodiversity, climate change, social aspects, agriculture, etc.

6. The Royal Institute of International Affairs

Dr. Fanny Calder

Associate Fellow, Sustainable Development Programme

- 6.1 The Royal Institute of International Affairs comprises an initiative known as Centres of Excellence for Technological Innovation for Sustainable Development for Africa (CETISA)
- 6.2 CETISA focuses on the need to support developing countries in the development of their own S&T capacity, and emphasises the importance of the innovation systems approach. The work of CETISA and that of NEPAD is closely related.
- 6.3 A series of workshops are to be held in Africa to develop African-led consensus based on a proposal to establish networks of excellence, especially in the provision of water and energy. Workshops will also be organised with NEPAD and the African Academy of Sciences. At the end of this process, it is hoped that there will be clear proposals in place for the development of centres of excellence to be presented to NEPAD countries and donors for implementation.
- 6.4 CETISA has the potential to be a partner in exploring a number of issues not limited to the establishment of centres of excellence, and that CETISA would be willing to adapt its proposals in accordance with NEPAD's needs.

Regional Co-operation in Science and Technology: Implications for NEPAD Presentations

Prof. Awele Madumezia (Facilitator)
Nigeria

7. ECOWAS:

Mr Kennedy Barsisa
Executive Secretary, ECOWAS

- 7.1 The presentation was on a policy framework on S&T as part of the mandate of integration and development of the West African sub-region. ECOWAS is in the process of developing a functional S&T programme for the region. It sees the convergence of its ideas with those of NEPAD, and looks forward to absorbing new ideas, knowledge and experiences from this workshop
- 7.2 S&T is central to economic development, and the development of S&T education, local knowledge, and know-how of S&T are requisites. Echo UNESCO on the need to strengthen cooperation between countries in the region through renewal of S&T education. This is pivotal to the realisation of the objectives of NEPAD.
- 7.3 The ECOWAS S&T framework already contains the main principals that motivated the formation of NEPAD. In Article 27, it specifically states that members states shall:
 - Strengthen their scientific and technological capabilities in order to bring about the socio-economic transformation required to improve the quality of life for their population
 - Ensure the proper application of S&T to the development of the sectors highlighted elsewhere in the document
 - Reduce their dependences on foreign technology and promote their individual and collective technological self-reliance
 - Cooperate in the development, organisation and dissemination of appropriate technologies
 - Strengthen existing scientific research institutions and take all necessary measures to prepare and implement joint scientific research and technological development programmes
- 7.4 The Division of S&T in ECOWAS is being launched, and the appropriate staff is about to be recruited to kick-start the programme
- 7.5 ECOWAS authority of heads of state has recently adopted protocols on education, recognitions of certificates, establishment of centre of excellence and their interaction with university and research institutes, and free movement of scientists by addressing immigration restrictions.

- 7.6 ECOWAS recognises the urgent need for in-depth reflection on the aim of S&T education in developing countries in general, and it is trying to acquire S&T knowledge that will foster [economic] development.
- 7.7 The dire development picture in the region (low enrolments, low literacy rates, low average life expectancy, high mortality rates, and high percentage of the population living below the poverty line – all of which are aggravated by conflict) calls for a rethinking of developmental strategies. ECOWAS regards education as indispensable to sustainable development, and S&T education is a key area in this. Need to reflect on linkages between S&T and society in an attempt to put them in the service of development.
- 7.8 There is an urgent need for in-depth reflection on the aims of S&T in developing countries in general. Looking at roles that ECOWAS should adopt given the backdrop of NEPAD, there is a need to take an innovative integration approach.
- 7.9 ECOWAS is taking practical steps to foster regional integration through the NEPAD mechanism, and has been assigned the role of coordinating and monitoring agency for the implementation of NEPAD in the West Africa sub-region.
- 7.10 At a meeting held in Yamoussoukro on May 17 2002, the "Strategy for the Effective Harmonisation of ECOWAS NEPAD Programmes" was formed, and a declaration and action plan were adopted by Heads of State and government for the implementation of NEPAD in west Africa.
- 7.11 ECOWAS will play their role in coordinating and implementing NEPAD in the sub-region, supported by the belief that S&T education is a crucial part.

8. Economic Commission for Africa (ECA):

Dr ZM Nyira

Chair, S&T Committee, East African Community

- 8.1 The East African S&T Council was established in 2001 by the Council of Ministers of the EAC. Its objectives are to promote regional cooperation and integration in research, science and technology.
 - 8.1.1 The Council acts as an intermediary between policymakers and sector specific working groups, and it identifies research areas of common interest, supports coordination and cooperation through linkages at numerous levels, recognises and supports regional centres of excellence, and supports the dissemination of research findings and S&T development.

- 8.1.2 The Council also undertakes other tasks, including the promotion of IK and ICT, and playing an advisory role for S&T councils in an effort to transform and harmonise their research procedures.
 - 8.1.3 The focal research areas include food security, cross-border natural resources (with a focus on energy and biodiversity), ICT, industrial research and development, and economic and social sciences issues.
 - 8.1.4 The EAC S&T Council is a framework for cooperation and action in areas of common interest and could serve as a useful framework for NEPAD.
 - 8.1.5 The financing mechanism is budgetary allocations to the Council by the EAC. There are also some common research funds from consortia of donors and bilateral funding.
- 8.2 Biosciences East Africa is a research initiative that could form a good model for other regions and an entry point into the NEPAD programme. It is a facility for implementing what the region has identified as its bioscience research priorities – but it is *not* meant to determine or identify the region's research priorities.
- 8.2.1 The objectives are to support through action, knowledge sharing and management, advice on bio-safety and IP management, etc.
 - 8.2.2 Beneficiaries include universities, African S&T community, and international agencies involved in agricultural research. Collaborators are envisaged to include national and regional agricultural institutions, other advanced research institutions, the private sector, and the international science and agricultural community.
- 8.3 The Millennium Science Initiative was started four years ago through the World Bank. It has already been established in a few countries (e.g. Brazil, Chile, Mexico), and is on the way to being established in a number of sub-Saharan African countries and Vietnam.
- 8.3.1 It aims to encourage and nurture world-class S&T through support and linkage of scientists, groups of scientists, and institutions. Key objectives are to address local challenges with global knowledge, and support capacity building in modern science.
 - 8.3.2 Different regions have been able to establish what kind of research agenda can be supported through this initiative, e.g. Uganda is looking to create an institute of advanced study and application of biotechnology. Algeria is also looking to develop a centre of excellence on mathematical studies and research. Zambia, Zimbabwe and Tanzania are also looking at using the programme.
 - 8.3.3 The characteristics of the programme are sustainability, evaluation by international independent scientists, capacity at local level, and networking for linkages.

9. Southern Africa Development Community (SADC):

Dr Keoagile Molapong, FANR Directorate, SADC

- 9.1 Cooperation in SADC and networking are not new, but the focus has been on economic programmes so far through a number of sectors such as energy, food, agriculture, mining, health, education, transport, and land management.
- 9.2 Cooperation in S&T for socio-economic development and environmental management will require cooperation on numerous levels. However, policies around S&T are not in place currently.
- 9.3 SADCC (the predecessor to SADC) had commissioned a study on a number of areas relating to S&T. The findings were that:
 - SADC economies are dominated by agriculture and mining
 - There is less than 1% expenditure of GDP for R&D
 - There is little or no incentive for researchers
 - There is a shortage of S&T professionals, aggravated by the brain drain
 - S&T education is biased against girls
 - There are gaps in IPR legislation
 - There is little S&T cooperation in the region
- 9.4 The absence of dedicated regional cooperation in S&T has thus far prevented the implementation of recommendations, e.g., from 1999 SADC Heads of S&T meeting to explore regional cooperation. New recommendations have included the launch of a regional S&T week.
- 9.5 The challenges for S&T in SADC include:
 - The need for an institutional framework for regional cooperation and integration, including protocols for cooperation
 - Promotion of technological policies and strategies
 - Public awareness among youth
- 9.6 The priority areas for S&T in SADC are regional and inter-regional cooperation and integration, capacity building, technology development, transfer and diffusion, and promoting public understanding of S&T.
- 9.7 Strategies for addressing these priority areas include: strengthening capacity for effective management of S&T, improving regulatory frameworks, and promoting collaboration with other initiatives, e.g., NEPAD.
- 9.8 SADC should align to NEPAD through the Regional Indicative Strategic Development Plan (RISDP) which is currently being developed.
- 9.9 In considering how regional coordination in SADC can work, there is a proposed model that depicts small regional consortia (including nations, research organisations, or even external research organisations) linking to strategy thematic areas. A Competitive Grant Fund would be established to fund the activities. They have proposed an eligibility criteria framework for the competitive funding and developed a framework illustrating the

organisational structure that would implement the regional competitive fund.

Summary of Morning Proceedings

*Dr. Mandi Mzimba (Facilitator)
Council for Geoscience, South Africa*

10. Summary: Regional Cooperation on S&T and Implications for NEPAD

Dr. M. Mzimba, RSA

10.1 Key themes from session were:

- 10.1.1 Networking
- 10.1.2 Partnership and cooperation, also around accountability and delivery
- 10.1.3 Integration – can be informed by programme scale / clustering as with the French experience
- 10.1.4 Policies, norms and guidelines for benchmarking and mapping of excellence
- 10.1.5 Similarity in regional objectives and intents, but less so for outputs
- 10.1.6 Monitoring and Evaluation of implementation to ensure delivery
- 10.1.7 Alignment of policy to regional objectives
- 10.1.8 Need to inform public and users of S&T
- 10.1.9 More effective IP management and capacity to manage IP at all levels
- 10.1.10 Balance between regional and national implementation

11. Summary: Lessons from International Experience

Dr Berrah, Algeria

- 11.1 IDRC: Key to S&T approach is funding initiatives driven by local people and involving capacity building. Making research active, closing the loop. Key is promoting networks, centres of excellence, and alumna. Examples of projects, e.g., nodal systems, research competition, biotechnology programme, media, ATPS, etc.
- 11.2 UNESCO: Defining UNESCO, areas in NEPAD presenting opportunities for collaboration in region, and what UNESCO has already done and can do. Areas for potential collaboration include: preconditions for development (peace & security, democracy, good government), and HRD / education.
- 11.3 EU: Involvement of Africa in global economy is declining. Key challenges are funding (EU to increase R&D funding), lack of capital in South making it difficult to collaborate with North, and brain drain (EU also has brain drain problem – maybe NEPAD can learn from their experience). Network of excellence could be the way to go. Funding model suggested: networks,

and big projects (large sum of money and many research teams).
Importance of benchmarking and mapping of excellence.

- 11.4 Inter Academy council: "Mobilising the world's best science to inform policymakers". How ideas move to impact. Report may support furthering aims of NEPAD.
- 11.5 French Ministry of Foreign Affairs: On French R&D in Africa. Substantial funds are available in the area of cooperation in devising areas for collaboration. State of S&T in Africa captured in recent publication – differs significantly from one area to another. Report available on Web. There are French policies supporting research in Africa: 1) importance of training; 2) support for research teams in south; 3) consolidation of teams and making them visible at international level, 4) inviting teams to participate at international level once recognition has been obtained. Solidarity Priority Fund directed towards research in Africa for €100 million. There should be an emphasis on social sciences. Research programmes cover fields such as agriculture, water, biodiversity, climate change, social aspects, agriculture, etc.
- 11.6 Royal Institute for International Affairs: On CETISA. Focus on need to support developing countries, and the importance of an innovation systems approach. CETISA is closely related with aims of NEPAD. Workshops and centres of excellence to focus especially on provision of water and energy. Hope to develop clear proposals around CoE to be tabled with NEPAD and donors. CETISA has potential to be a partner on a number of issues and is willing to adapt its proposals according to NEPAD's needs.

12. Summary: Country Perspectives

Dr. M. Orkin, RSA

- 12.1 Centres of excellence:
 - Smartly networked centres as opposed to centres of excellence
 - Creating Leapfrogging paradigms
 - S&T for sustainable development
 - Capacity building assisted by relevant diffusion directed to lead projects
 - Expanding the potential of biotechnology
 - Developing SMMEs
 - Achieving relevance for the poor
- 12.2 Governance issues:
 - Applying own budgets to a new approach
 - Structuring relevant criteria
 - Creating receptive public environment

- Building from schooling upwards
- Empowering the poor to become innovators

12.3 Databases and data

- Determining the varied African S&T landscape: resources, trends, regions and country
- Creating adequate datasets required
- Compiling an inventory of institutions and skills
- Building a community of science database

12.4 Tools for national S&T advancement:

- Legislating the percent of GDP spend for S&T
- Leveraging international funds and legal instruments
- Building tertiary industry relationships, incubators, start-ups and capacity building
- Creating agencies for special priorities (biotechnology, energy, space – New Africa Space Agency)
- Forming academic and disciplinary groups
- Creating linkages to schools
- Influencing political will

12.5 Unresolved controversies:

- The Diaspora: how to link and with what worth?
- TOKTEN pros and cons
- Understanding mechanisms relating to technology and real development
- Mainstreaming technology with regard to NEPAD priorities
- Taking NEPAD into households
- Improving links between natural and social sciences

12.6 Regional issues:

- Flagship projects are to be made more visible.

13. “Summary of Summaries”

Dr. Mzimba, RSA

13.1 Key elements emerging are:

- Centres of Excellence
- Leapfrogging for poverty alleviation and development
- The need to undertake projects that highlight successes (flagships)

- 13.2 There are some differences in focus at the different scales:
- International: focus on resources, and harnessing for mutual benefit
 - Regional: focus on networking, sharing information, partnerships
 - National: HRD issues, involving citizens in S&T agenda, real development gains

14. First Plenary Discussion

- 14.1 (RSA) The different definition of technology transfer offered is important: from turnkey solutions to “technology cooperation.”
- (EU): Technology transfer is repressive. There are examples of technologies where technology cooperation which can provide a much better common socket for research. Cooperation is a longer-term issue – management, training, updating and disseminating packages. It is an important opportunity for NEPAD to invest because much of the talk around CoEs is related to the discovery phases of research. But the point can be made that while discoveries are made every day and at marginal cost, technology driving the economy means a comprehensive development system.
- 14.2 (RSA) On the international activities presented:
- Most focus on energy and water. While this is understandable as they are real problems in Africa, there is a range of other activities that should be looked at – biodiversity (conservation and exploitation), health, etc. NEPAD could help in coordinating the activities of these international mechanisms. For example, are the areas of energy and water possibly oversubscribed?
 - It would be helpful to hear what the lessons learned from all these activities are. The EU gave some honest comments that are useful.
 - (France): Many countries have been going through the “prizes” phase. The link between universities and research has not been made; it is necessary to consider how to place a link between research centres that are officially supported, universities, and departments for the new generation. Also, there is the question of how departments of universities are to be incorporated into the notion of centres of excellence. If CoE just means walls and institutions that are already constituted, there will be a need to build partnerships.
 - (UNESCO): Recommend identifying specific goals, targets, and indicators against which to measure programmes. Without these, the programme will just drift. Emphasized the importance of monitoring progress continuously – otherwise we could be regressing. While we would all like to be developed countries one day, proposes that it is possible to develop and then “un-develop” again.
- 14.3 (Egypt) We have the knowledge and know-how in Africa, but then we keep going outside Africa to the USA or Europe. It is necessary to have the

databases to know that there is expertise within Africa – we should be more inclined to deal with Africans than other countries.

- 14.4 (Egypt) Question about why the UNESCO publication shows nothing on northern African universities and grants when there is a lot being done there.
- (UNESCO): This is because of the way UNESCO divides the world. A number of northern African states are grouped with Arab states, not Africa.
- 14.5 (Nigeria) The issue of environment and bio-resources conservation and has not been highlighted.
- 14.6 (RSA) Centres of Excellence could turn into a big exercise. It was suggested that perhaps CoEs could happen naturally, as with the example of the Africa Laser Centre which simply declared itself as a CoE and was accepted widely as such. NEPAD's job should not be to designate or assess CoEs, but rather to record CoEs. It should set simple criteria (e.g., number of countries involved, senior researcher involvement, etc., also taking into consideration NEPAD's areas of priority) and then set up a "recordal system" rather than a review system. The CoEs should then stand on their own merit.
- 14.7 (Nigeria) Propose three possible criteria for CoEs:
- Each NEPAD country should identify centres of activity (COA)
 - Classification of COAs discipline-wise (energy, water, bioscience, etc.)
 - Ranking of the COAs so that top ones can be chosen as CoEs
- 14.8 (France) Expressed concern about rushing to CoEs as primary structures because then there is no mediocrity left. Need to have a system where you can evaluate and review what you are doing. This requires looking at how bad you are, not just how good you are.
- 14.9 (RSA) It is understood that the purpose of the session is to identify high-level themes on which further work needs to be done (networking, CoEs, capacity building, resourcing strategies, etc.). There are many models for CoE and further work should go to determining which one(s) to go with. The question should be whether the Workshop is satisfied that all of the themes have been identified and agreed upon.
- 14.10 (Nigeria) Suggested looking at the Technology Know-how Acquisition programme in Nigeria in terms of leapfrogging. The programme gets a group of qualified young scientists and grows them. It diverts from the idea of turnkey projects. Offered examples of Nigeria-Algeria and Nigeria-Egypt linkages.
- 14.11 (Nigeria) There is a linkage problem regarding the key themes. A committee should be set up (possibly a NEPAD committee) to link up the themes and harness them into a useable framework, including how to link to universities.

- 14.12 (RIIA) Some thinking is required on what issues need to be addressed in institution design and design of programmes to make sure that they really deliver. NEPAD could assist.
- 14.13 (___) While the "allow many flowers to bloom" model is a good one, given limited resources it will be necessary to prioritise. Should recognise that NEPAD has potential power in encouraging national governments and others to fund those strategic centres.
- 14.14 (RSA) Must be able to assure political principles that we have access to the information required. How will the proposed databases be built? Propose that it is impossible to have a top-down process to do it – that each country has to build its own database bottom-up. The focus should be on the national level, and the NEPAD process will only serve to set standards – not to come in to evaluate countries because there would be sensitivities to nations being reviewed externally. It is important not to try to expand a national process to a continental process – NEPAD should not be trying to steer S&T in Africa from one central point.
- 14.15 (RIIA) There should also be gains. How do we scale up and add value? This is a useful role for NEPAD.
- 14.16 (RSA) Expressed idea of moving from CoEs to "networks of excellence." A networked group of associations rather than only concentrating at institutional level.
- 14.17 (RSA) A major impediment to S&T cooperation on regional, bilateral and multilateral base is the modalities and mechanisms to enable S&T cooperation. There are a large number of non-functional bilateral agreements, for example. It is important to consider how to enhance the ability to cooperate between countries.
- 14.18 (IAC) Simple solutions and definitions do not exist. NEPAD should not look for a single arrangement that would suit all needs. There are a variety of solutions.
- 14.19 (Algeria) Question of whether the S&T community in Africa is committed to working in the NEPAD (research and cooperation) context. It might be interesting to undertake actions to make this community commit itself to acting within the context of this framework so as not to have NEPAD functioning at the bottom-end of priorities.
- 14.20 (RSA) It is critical to enhance capacity for African scientists' mobility within Africa. Right now, it is far easier for scientists to go overseas. Also, funding incentives should be created for cooperation in research on NEPAD programmes (although not to the exclusion of global science).
- 14.21 (RSA) It is necessary to consider how we would shape the strategy. There have been warnings about funding for research moving into the private sector. Most Workshop participants represent publicly funded institutions. We could be chasing a moving target. This issue also needs to be looked into in detail beyond the Workshop.

- 14.22 (RSA) The portfolio of activities proposed at the Workshop is very wide and diverse. There may be a need to come up with a differentiated approach for dealing with the portfolio in terms of determining what exactly should be tackled, what the associated challenges are, implications for infrastructure, levels of investment required, etc.

15. Key Elements for Output

Dr. John Mugabe

- 15.1 It is necessary to recognize that the Workshop is dealing with a non-linear process, and consensus decision is not the goal. The idea was to have a range of options to experiment with.
- 15.2 There is a common vision with two facets:
- 15.2.1 Africa should be researching and acquiring science and new technologies to solve its human development challenge. It should not be depending on outside (exogenous) technologies.
 - 15.2.2 Africa should aspire to be generating and selling its science and innovations to the rest of the world. Not only importing, but also participating in the global economy.
- 15.3 The conditions required for creating an enabling environment for Africa to achieve its overall goal of being a continent that is developed scientifically and technologically have been discussed (nature of S&T policies, the need to leverage new and additional financial resources for S&T activities countries, centres of excellence, etc.).
- 15.4 Proposals have been made around the mobilisation of capacities in terms of human resources. It must be ensured that African expertise located in Diaspora is made available to and utilised by Africa. This requires knowing what the content (nature, relevance) of that Diaspora is. Conducive conditions must also be created for the expertise to be harnessed and utilised by African countries.
- 15.5 Another issue is that of what Africa has in terms of S&T activities but is not known to or not utilised by Africa – e.g. agencies that are doing R&D or training, and so forth. Some proposals were made by Algeria on the need to map out the S&T landscape in terms of what is being done by Africa and for Africa.
- 15.6 Need to move to best practices – promote sharing of experiences and lessons. Looking to countries that might have, through their work, produced models that can inform the region and/or other countries.
- 15.7 A number of principles have been articulated on Centres of Excellence – how to establish CoEs and improve the quality of agencies doing S&T in Africa. The principles are:

- The importance of institutional diversity. There cannot be a monoculture of institutions or institutional arrangements.
- That the CoEs cannot be pre-determined because the process of creating centres is evolutionary – there are uncertainties, changing priorities, numerous challenges, and parallel efforts.
- Flexibility to allow for cultural and political diversity. It is possible to focus on a deliberate approach, including developing criteria and indicators, but not to specify standards.

15.8 In summary:

- 15.8.1 What is being developed is a common vision of Africa as a generator of S&T to solve its problems, and Africa as seller of S&T to the rest of the world.
- 15.8.2 There is a need to build a reliable information and knowledge base on the status of S&T (research, researchers and institutions) in Africa.
- 15.8.3 Regional cooperation is critical
- 15.8.4 It is important to establish norms and protocols to regulate S&T cooperation in the region, which will also help to determine institutional arrangements and financial instruments.
- 15.8.5 Capacity mobilisation must include additional training and mobilisation of existing skills (not just over-investment in getting new skills while not utilising existing skills)

16. Second Plenary Discussion

- 16.1 (RSA) Enquiry on the level of detail required and the process forward for Workshop.
- 16.2 (RSA) It is recognised that a number of databases, networks, etc. already exist. How far do we go into locating these in order to bring them together to consolidate or interact with them? Need to avoid a situation where we knowingly reinvent the wheel.
 - JM: NEPAD can play two related roles. (i) To bring that knowledge to the political platform so that it can be used to make decisions, i.e., mobilising existing knowledge. (ii) There may be gaps because of the regional nature of NEPAD's focus compared to national processes – e.g. harmonising policies. It may be necessary to create new processes to bring new information to the decision makers.
 - ABT: Should be mindful of the fact that this involves a much larger community. The output of the work should be shared with that larger community to elicit their inputs and comments. The foundation being laid is for a much larger exercise, and this is part of a process – not an event. There is a shared vision emerging including the need for strategies, implementation frameworks, etc. This will need to be carried forward and built upon.
 - (RSA): Little has been said about time. Time to set up centres, etc., but also about the long-term commitment into the future.

- 16.3 (RSA) Minerals and agriculture are some of the areas being looked at in terms of market access and beneficiation. What S&T and R&D interventions can be looked at in those areas? In discussing an action plan for S&T, we need to move in tandem with the other programmes of NEPAD and add value to them.
- 16.4 (RSA) The S&T area should be offering specific science planning, science policy, etc. inputs to the other programmes, including how research, expertise, and new R&D can be applied to address issues, e.g. in agriculture. A combination of technology assessment skills as well as technology planning skills will be required, and these can be clear outputs within set timeframes. There must be constructive engagement of the NEPAD Secretariat over a period of time on the specific areas where S&T can make a contribution.
- 16.5 (RSA) There is a high-level vision for S&T in NEPAD. This can be agreed upon and endorsed by a group such as that at the Workshop.
- 16.6 (Nigeria) S&T in NEPAD can serve as an engine room for other areas of NEPAD, but the issues of funding need to be addressed.
- 16.7 (EU) Databases have a bad reputation these days. This activity should be approached differently – mapping competence and expertise, and using different software technologies. Group-based technologies should be used, e.g., so that online updates can be carried out regularly. It is important to have an overarching vision of what the NEPAD competence is, and how it can be used, retrained, and redirected. This requires going through a specific technological development process.
- 16.8 (RSA) Perhaps what is needed is a data strategy rather than a database. Unless there is a clear incentive (or disincentive), databases easily become repositories for historical data. Solutions are required that are not consultant-driven, but that are driven by the needs of institutions around the sharing of information. Need to place onus at national level; this cannot succeed at a continental level.
- 16.9 (RSA) Youth need to be incorporated, and elements of youth and culture should be highlighted in S&T. The issue of IK also has not been highlighted.
- 16.10 JM: What are the mechanisms for moving forward?
- (Nigeria): Nigeria has an intergovernmental steering committee including all regions and supported by Heads of State. Their Terms of Reference is to advise Heads of State in the zones in terms of S&T. They are also required to look at modalities for funding.
 - (RSA): The differences should be defined between policy and strategy work, and the technical cooperation and integration work on the implementation side.

17. Mechanisms for Moving Forward

Dr. John Mugabe

- 17.1 Some recommendations that have emerged are:
- The establishment of a high-level inter-governmental committee (Ministers of S&T or senior policymakers at the level of Permanent Secretaries of Director Generals)
 - The establishment of a technical group to provide intellectual support or guidance to the inter-governmental committee (IGC). Also referred to as the "panel of eminent scientists," this group would unpack the issues.
 - The establishment of a coordinating committee. Such a committee would lead the process of drafting a NEPAD S&T framework. The framework and programmes would be submitted to the IGC for debate, endorsement, policymaking, and financing. Should reflect on whether it might be compromised to have one group doing everything, including endorsement.
 - Establishment of an electronic forum for taking the process forward. The panel of experts would synthesize the information from this forum and provide the information to the IGC.
- 17.2 (RSA) It is necessary to have both layers – the technical team as well as the political endorsement.
- 17.3 (RSA) A high-level forum is important, and the Ministerial level is appropriate. A technical working group is also important, and is similar to the OECD structure. The OECD also has a third structure – NESTI – which focuses on indicators and benchmarks. In talking about a database and information management issues, it is necessary to establish capacity or else it will always be necessary to get others to come and review what we are doing. Three structures are necessary:
- a knowledge management structure (performance benchmarks, indicators, etc.),
 - a structure for delivering programmes and outcomes, and
 - a mandating structure (political leadership).
- 17.4 (ECA) The experience of the Presidential Forum on S&T for Africa offers a lesson from the past. The Forum had political muscle, but this was not displayed in terms of action. It is necessary to get the support of Heads of State as political muscle, and this could be done through a Ministerial forum that can deal with policies and strategies at the political level. There must also be a mechanism through which the Heads of State can keep track of what is going on. But experience has also shown that that Ministerial forums are not very well informed. A level below will be required which is technical to deal with matters of a scientific nature and strategies for implementation. This level can produce data and information that will feed into policies and strategy-making processes.
- 17.5 (ECA) It is also necessary to be able to scan and monitor progress – a way to scan the status of S&T and measure whether we are developing or not. This may require starting off with baseline study, and establishing indicators that measure the rate of development. RSA has this, and

Uganda has also been learning from this. The information is updated from a sectoral level (education, ICT, etc.) and also at a national level.

17.6 (NEPAD Secretariat) It is important to keep a few things in mind:

- 17.6.1 NEPAD has a Steering Committee in place, and it comprises of the personal representatives of the Heads of State that make up the Heads of State Implementation Committee (HOSIC). The committee meets once every three months. Before establishing a Ministerial committee, it is important to establish whether there is enough for them to do – not just an event. This problem has been experienced in the Environment area.
- 17.6.2 NEPAD is a programme of the AU, therefore it is necessary to take cognisance of the AU processes as well, e.g. their processes in place with regard to S&T, and see how to merge or link the two. The Workshop should not propose things that are completely out of place with their thinking.
- 17.6.3 NEPAD has a lot of other processes relating to the issue of indicators, benchmarks, and CoEs. One of the flagship processes is the African Peer Review Mechanism which will be launched soon. This question of evaluation can feed into that. Decisions on S&T also need to be reviewed for compliance. Do not be afraid to venture into other areas because they interlink into NEPAD.

17.7 (EU) Need to have a credible interlocutor. 1% of GDP cannot mean 1% of government spending. This commitment must significantly include investment from the private sector. There will have to be credible process to bring business and civil society on board.

17.8 (RSA) It appears that, in summary, a three-pronged approach is being proposed:

- A technical committee to be formed
- It is informed by a monitoring and evaluation committee / group
- Both these groups will inform a Ministerial Forum which will ensure the buy-in of the Heads of State

The approach will take the current NEPAD structures into account.

17.9 (JM) The following outputs are anticipated from the Workshop:

- i. A Statement of Commitment, or some resolutions. A draft 2-page document will be circulated. This does not contain everything tabled over the two days, but it will give a sense of some of the actions that need to be undertaken fairly fast to move the process forward.
- ii. A report of workshop. These will be detailed proceedings that will be available to everyone.
- iii. A synthesis document. This will summarise the issues have emerged from discussions and specific recommendations made.

17.10 The set of documents will serve in guiding the process forward. They will also serve as the record from which to move forward in subsequent sessions.

18. Closing

Professor A. Babatunde Thomas

18.1 There are two important elements to stress in outputs for discussion:

18.1.1 The shared vision emerging out of the Workshop exercise must take account of the need to ensure that whatever we do is underpinned by the challenges of poverty, peace, security, and democratic governance in our region.

18.1.2 The need to ensure that there is buy-in on the output of this exercise, both at the high level and from the larger community. Some of the outputs will be Web-based so that the external community can give input and buy-in, particularly the political community.

18.2 The issue of structures is also very important; it is good that some consensus was reached on this issue.

Developing a NEPAD S&T Framework: The Way Forward

Dr. R. Marcus (Facilitator)

Chairman, National Advisory Council for Innovation (NACI) South Africa

1. Developing an S & T Framework for NEPAD: “Statement of Commitments”

Dr. John Mugabe, NRF/NEPAD

- 1.1 The preamble structure is an articulation of the commitment of the Workshop group; a reaffirmation of S&T for human development and Africa's sustainable development; the importance of Africa integrating better into the world system through S&T; the financing of R&D by ensuring that domestic and regional financial resources are allocated to S&T; the need to treat S&T as the cross-cutting theme in the NEPAD processes (not as a sector, but as a foundation for NEPAD's programmes); a reminder of past commitments; and the need to establish strong mechanism for S&T cooperation at regional level in a inclusive process (including south-south and north-south collaboration).
- 1.2 The second part of the document is a list of the concerns that have been raised. The need to build an information base to know what is happening in S&T in the region; the need to ensure that whatever is undertaken by African countries is done in a way that maximises synergies and impact; the importance of getting African research institutions within and across national boundaries to network; the weak link between activities of science institutions and industry; the importance of S&T to address poverty-related problems; brain drain; the declining interest in and quality of science education as part of the capacity building challenge; and that most countries have not achieved the goal of investing at least 1% of GDP on R&D activities.
- 1.3 It is proposed that the Workshop should resolve the following:
 - 1.3.1 *We establish processes for strategic assessment of national policies, strategies and performance on science, mathematics and engineering education. These processes need to urgently target countries where limited data is available.*
 - 1.3.2 *We establish processes for comprehensive assessment of Africa's science and technology status, research capacities in key fields relevant to the strategic goals and programmes of NEPAD. The assessments should be phased in such a way as to provide the basis for identifying science and technology inputs to NEPAD priorities. (This would serve to identify gaps so that NEPAD's goals can be addressed)*
 - 1.3.3 *Consistent and ongoing efforts should be made to mainstream science and technology in NEPAD's sectoral programmes on health, agriculture, education, environment, governance, infrastructure, security, investment and trade. (S&T should not become a stand-alone area in NEPAD; should*

- recommend in specific ways how S&T can be built into the programmes.)
- 1.3.4 *Strengthening centres and networks of excellence in support of the broad objective of science and technology institution building is critical to achievement of Africa's interests in the global context. (Treat efforts aimed at creating CoEs as a critical aspect of the NEPAD S&T platform; it should form part of the effort aimed at building institutions, not as events or as the creation of structures.)*
 - 1.3.5 *Where appropriate, concrete regional scientific research and innovation programmes on, for example, space science, indigenous knowledge, desertification, information and communication technologies and biotechnology, among others, should be developed and adopted to address the challenges of poverty reduction as well as other problems and opportunities agreed upon within the NEPAD framework. (Based on the idea of focussing on some specific S&T fields.)*
 - 1.3.6 *A dynamic and responsive system of indicators and supporting data should be developed to underpin performance monitoring and strategy setting. (Need to have performance indicators for monitoring, evaluating, and refining strategies.)*
 - 1.3.7 *NEPAD should establish an open forum to engage all stakeholders in constructive dialogue on ways and means of strengthening Africa's scientific and technological base. → (Recognising that this has not been an inclusive process. A lot of key stakeholders have not been involved; their views need to be included and priorities established through an inclusive, cooperative process.)*
- 1.4 On the nature of process to ensure that the resolutions are implemented, it has been recognised that there are many complex issues involved that require further thought. The following principles should be considered:
- 1.4.1 Knowledge-Intensive: It is crucial to establish a knowledge-based process to avoid moving into decisions in the absence of adequate and reliable knowledge, e.g. in terms of some of the science policy questions that have been raised, ethical questions, gender considerations, etc.
 - 1.4.2 Decentralisation: Although programmes can be consolidated at a regional level, key decisions will be made by actors at national and local levels. The process should therefore be anchored at the national level. This may require having national workshops and establishing sub-regional bodies to consolidate national and local inputs.

2. Developing an S & T Framework for NEPAD: Recommendations

Dr A Paterson

Chief Operating Officer, Department of Science & Technology, South Africa

- 2.1 Three recommendations have been made:
- 2.1.1 *Establishing a High-level Forum on Science and Technology. The Forum should be composed of African ministers of science and technology, and/or presidential science advisors. It should be supported by senior policy-makers and will engage in dialogue and decision-making on effective means of*

building the continent's scientific and technological development. Resolutions of the High-level Forum on Science and Technology may be transmitted to the NEPAD Heads of State Implementation Committee. (This is calling for a political mandate to take the actions that are necessary using the important priorities and challenges of NEPAD, and the opportunity for S&T to contribute to those, as the primary issue. Nothing in particular is said about the regional frameworks; it is felt that these need to be strengthened in terms of their S&T capacity and this could be addressed through the Ministerial Forum. The Forum could begin with proxy countries, and then rapidly be expanded. The major mechanism for interacting with NEPAD will be the HOSIC.)

- 2.1.2 *Establish a panel or working group of eminent African experts—drawn from communities of scientists, industry, policy-makers and practitioners—to provide policy, strategic and technical advice to the High-level Forum. The panel or working group should propose a NEPAD science and technology programmatic framework. In conducting its work, it should draw on the existing national, regional and international resources. African countries should be enabled to participate in particular initiatives at their discretion. (This recognises that political formations and detailed workgroups are required that draw from knowledge. The panel would have to be composed in a way that there is a feeling of ownership from the states. This will not be a closed group of people who determined the future, but rather an open group where interested parties can freely participate. The Working group can feed important issues into the High-level forum, and be accessible to individual countries that may want to draw on their expertise. Resources that exist at national levels would do most of the work such that this body draws on the capacities of the individual nations. This can form the early stages of network development, capacity development, and sharing.)*
- 2.1.3 *Set up an electronic forum, meetings and workshops as appropriate to facilitate dialogue and engage all stakeholders to develop a common vision, agenda and action plan to promote and sustain Africa's scientific and technological development. (Suggests making effective use of modern technologies to get as much done as efficiently as possible. It is necessary to engage industry, debate specific issues of interest, etc. The forum must have a multi-stakeholder character, and anyone should be able to participate in developing S&T potential to advance NEPAD.)*
- 2.2 It will only be possible to mobilise resources when there is a High-level Forum. The initiative will initially rely in international structures (UN, EU, etc.) to develop momentum around this. It is also necessary to reflect upon how this is brought to being.
- 2.3 Nations must be impressed upon in terms of investing their own resources as well. Those resources would not be sufficient, but there has to be improvement in spending in countries otherwise it is difficult to mobilise other resources. The nexus for action in NEPAD is the individual country. Their national indicative programmes and planning frameworks will have to mainstream S&T so that it can happen at sub-regional and continental level. This is difficult to write into the document, and therefore it has not been written in. This is also because the Workshop has no mandate to

access or discuss funding. It may be proposed that financing S&T is one of the themes to be picked up in the electronic forum because financing can be a serious constraint.

- 2.4 There are a number of practical arrangements to be sorted out, and this should be done urgently to maintain momentum. The Workshop is looking for any practical suggestions for getting the working group rolling.
- 2.5 The issue of the process for specific engagement of NEPAD sectors also has not been explicitly raised in the Statement. This initiative is timely now that the other NEPAD sector programmes are in place, but the S&T link needs to be addressed now. The NEPAD Secretariat will have to be engaged on this matter.

3. First Plenary on “Statement of Commitments”

Respondents:

ABT – Prof. A. Babatunde Thomas
AP – Dr. Adi Patterson
JM – Dr. John Mugabe
RM – Dr. Roy Marcus

- 3.1 (Algeria) The Statement of Commitments document faithfully represents the content of the deliberations at the Workshop. One should not get into a more detailed version of the recommendations and statements; the precise version of the recommendations and statements will require time, sedimentation, and further articulation.

On the recommendation regarding CoEs, propose saying “Consider the creation of / envisage / deepen” instead of “strengthening” which assumes that there are existing CoEs. Also fix date on first page.
- 3.2 (RSA) Supports document. Some further revisions:
 - Paragraph 4: Refer to “frameworks and implementation programmes of NEPAD” instead of “ work of NEPAD”
 - Resolution 3: After “world trade”, include “and others”
 - Resolution 7: Should responsibility lie entirely on NEPAD, or should NEPAD be open to enlist other structures to support? Suggest changing to “NEPAD, and where necessary other relevant, competent and interested structures, commit themselves to...”
 - Recommendation (a): In the last sentence, saying “may” suggests the option of not doing so which is too open-ended. Give an explicit role to HOSIC. Delete “resolutions of the”, and start with “The High-level forum of S&T should report to the NEPAD HOSIC”. This creates more direct linkages.
 - On CoEs, it is not a case of either-or. Revise to say “Strengthening and, where necessary, creating centres and networks of excellence”

- 3.3 (Nigeria) The Nigerian delegation is happy with the draft. Written recommendations will be tabled for more details to be included.
- 3.4 (RSA) Document is a fair reflection of what was stated in course of the workshop. Some suggestions:
- Reflect title of Workshop. Remove “subscribing to the founding principles of NEPAD,” or remove into subsequent statement – before “Reaffirming...”
 - Would not insist on greater elaboration or detail.
 - The recommendation that these organs be established raises the question of when they will be established, modalities of how this will be done, etc.
- 3.5 (Egypt) Appears to be a strong commitment for the governments, and Egypt is committed. Some comments:
- On the reference to the Cape Town Declaration – this did not include everyone from the African continent. Rather make reference to the WSSD and MDG commitments which everyone was part of. Cape Town could be given a secondary role. Northern Africa was excluded from ACP.
 - In Resolution 1 and 2, the term “assessment” gives a sense of creating a body to monitor the performance of these processes. The idea is rather to review or coordinate. Use an easier word for politicians to agree to – cannot supersede what national policies and procedures pursue.
 - Commend the three recommendations for mechanisms; eminent African scientists could be used in this context.
 - The phrase on the electronic forum needs some clarification. Is it starting from the Ministerial Forum or directly from S&T community? The Ministerial level is not always easy to include in meetings.
 - Agree to strengthening and creating CoEs in Africa, but it should also be open to other parts of the world.
 - Egypt will be willing to assist in the drafting committee.
- 3.6 AP: The improvements to the document are appreciated. The changes will be adopted. The idea is to keep the statement as brief as possible to focus energies. There are a number of issues, e.g. gender, youth, etc., that are not covered in the document. It is understood that these will be taken up going forward.
- The term “assessment” could be changed to “review”, but it should indicate that it would be with the support of the countries involved. It is not the intention that super-ordinate bodies should be created.
 - On the motivation for the Ministerial Forum – these are usually the last to be created. Absence partly results in the marginalisation of S&T. The initiative will only take on life if the Ministers are able to mobilise themselves and take on work because political will is essential. This needs to be taken ahead through the NEPAD structure. Some of the initiating countries should suggest how to take the process forward.

- With regards to the electronic forum, the term “forum” may be misleading. Perhaps it should be referred to as an electronic “workspace” or “discourse.” It will be a conversation space, not a place where decisions will be made.
- Need to look carefully at language. The authors have deliberately avoided making the ministerial parts seem to instruct Ministers / politicians on what to do. The drafting team can work with willing parties to strengthen the document to some extent.

3.7 (RSA) Some additional comments:

- “Noting that...” section, No 6: Change from “declining interest” – say “need to restore active interest in and quality of...” or “enhance”
- Resolutions: There has been a lot of emphasis on capacity development in discussion, but this doesn’t come through strongly in the document. Perhaps include something on this as an 8th resolution?
- Recommendations: There may be a need for some sort of secretariat to support the activities, especially of the Forum and Panel. This could also serve as the locus for maintaining, updating and populating the electronic platform. Maybe add as an item D. There would be issues to resolve, such as the shape of such an entity and how it would be staffed, funded and located. Could phrase as “propose to investigate the funding of a secretariat to support the...” This recommendation is based upon the experience of presidential and advisory committees that bring forth eminent people, but have weak impact because there is no infrastructure for taking decisions forward.

3.8 (RSA) The issue of such a secretariat could be mentioned, but it is important to note that a Declaration is typically not a plan of action. Some additional observations:

- The Statement does not assign ownership to anybody. The Statement needs an appendix including a brief intermediate plan of action and allocating responsibility for implementing those things.
- The forum of experts could create the opportunity for all sorts of other forums, therefore the need to retain this forum must be argued.
- The body of the document suggests the need to build the profile and awareness of S&T, and the value-adding potential to NEPAD. Would not draw parallels between S&T and the sectoral themes. It is crosscutting and deserves a separate dispensation.

3.9 (NEPAD Secretariat):

- Resolutions: Who is the “we”? Consider changing this.
- On mainstreaming S&T in sectoral programmes, the Statement does not refer to strengthening civil society. This needs to be considered in terms of mainstreaming.
- Recommendations: There is a similar structure already established in the NEPAD Water & Sanitation Programme, and there is also a task force which is a think tank of individual experts (not representatives) and multi-

lateral institutions. It might be worthwhile to consider this model because the think tank is funded by donors.

- Funding should be considered. Have to start considering setting up an S&T fund and decide how it can contribute to issues that have been raised, e.g., capacity building.

- 3.10 (RSA) Suggestion that drafting points be submitted in writing.
- 3.11 (Egypt) Find another name for “Statement of Commitments.” Only 5 steering committee members are represented at the Workshop, and this might create other reactions.
- 3.12 JM: Proposes that we read declaration together with the Abuja Declaration. The Abuja document which is available had a timeframe to setting up a ministerial forum which is to have met by this year.
- 3.13 (Nigeria) Request for email address where written submissions can be sent.
- 3.14 AP: Indicated that the document is to be completed the same day. Recommendations must be submitted immediately.

4. Second Plenary on “Statement of Commitments”

- 4.1 (Nigeria) Nigerian delegates propose that in moving forward, Nigeria, Algeria and SA take the initiative to convene high-level forum at Ministerial level. NEPAD Secretariat to assist in developing terms of reference for this forum.
- 4.2 AP: It important to have proposals. If the three countries work with the Secretariat, they can come up with TOR. Another suggestion is to extend to the 20 implementation countries of NEPAD and other interested countries so that there is broader representation. Between the 3 countries, with the support of the Secretariat, an appropriate venue could be determined at a specified time not too far away. There is enough on the table to advance the work with some urgency.
- 4.3 (RSA) Who will initiate this?
- 4.4 (Algeria) Would like to soften this proposition. The delegations need to get back to their countries to report, give feedback, and review the declarations. Then things can go naturally from there, rather than having to report back that decisions were already taken. Give the countries time to discuss.

- 4.5 Proposal that it will be necessary to brief Senegal on what happened at this meeting. It was agreed that Senegal should be updated, but that the initiative should move forward with organising the ministerial with the nations that were involved at the session.
- 4.6 (NEPAD Secretariat) The AU must also be brought into the process, and make proper preparations. The AU may have a process in place with which the initiative can align.
- 4.7 (Egypt) Suggest having the 5 initiating countries involved, and include the AU.
- 4.8 AP: The meeting with Ministers should be to obtain a mandate and working plan for the expert group. The Declaration is constructed such that the expert group supports the Ministerial and not the other way around. Experts group should not be doing work that they are not mandated by Ministers to do; the Ministers should be giving a sense of direction for the work. From this comes endorsement of the work for the working group, composition, and breadth of mandate with support of the Secretariat. It is probably not necessary to seek formal endorsement of the AU, but the initiative will certainly want to coordinate. The Secretariat is in position to advise on how to drive the engagement with the AU.
- 4.9 (RSA) On the second draft of the Statement, there is a suggestion that "We hereby resolve" is a bit too definitive. Perhaps change to "We hereby acknowledge the need to..."
- 4.10 (Nigeria) "Resolve" is okay.
- 4.11 (Egypt) Prefers "acknowledge the need to." Goes with the flow easier than resolve.
- 4.12 (Algeria) No strong view on this.
- 4.13 AP: Will probably have to go with the weaker language in following with G55 process since there is no strong position on the matter.
- 4.14 (RSA) Suggest that paragraph 7, 4, and 3 on page 1 and 2 are similarly phrased.
- 4.15 AP: Those sections express concerns rather than negative language. Will therefore opt to stay with the language unless it is possible to make editorial changes without damaging the concept.
- 4.16 (RSA). Comment on ordering. Page 2, move #5 and 8 to become #2 and 3 respectively. This will follow with #1 on the needs of people.
- 4.17 AP: This will be noted and the Statement reviewed to look for a more logical order.

5. Vote of Thanks

Mr. S Dogonyaro

Principal Programmes Coordinator, NEPAD Secretariat, Nigeria

- 5.1 Mr. Dogonyaro acknowledged the tremendous support and hard work put in by Department of Science and Technology, as well as the level of commitment and participation witnessed at the Workshop.
- 5.2 NEPAD is fully committed to the development of S&T. Unless we underpin other sectors with S&T, Africa is not likely to achieve development.
- 5.3 The Secretariat will make itself fully available to support the processes. The Heads Of State meeting on 08 March 2003 will be an opportunity to report on this process – i.e., that the process of developing the S&T platform has begun.
- 5.4 Reminder that we have a different process here. With HOSIC, can get decisions on things very quickly. Must seize the opportunity to get things moving.
- 5.5 Thanks to Professor Thomas. Glad to say that Prof Thomas has accepted to continue working with us on the area of S&T and will play a critical role.
- 5.6 Thanks to all who have taken time to present papers, facilitators, contributors, interpreters, technicians, hotel and hotel management for excellent facilities, planning and secretarial staff from Department of Science and Technology
- 5.7 (Adi Patterson, DST): Thanks to delegates from other countries. This goes to building a Science and Technology community in Africa which is interested in developing and transforming the continent. Thanks to those from Europe and US – it is helpful to learn from their many mistakes, as well as from the positive lessons.
- 5.8 Special thanks to Prof Thomas for excellent facilitation, John Mugabe for passionate support, Dr. Neville Arendse of DST, and the officers of the Secretariat.

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