science and technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

NATIONAL NORMS AND STANDARDS FOR A NETWORK OF SCIENCE CENTRES IN SOUTH AFRICA

2005

PREFACE

The White Paper on Science and Technology of 1996 advocates for a "campaign to promote awareness and public understanding of Science and Technology (PUSET) and of its importance". This campaign commenced with the Year of Science and Technology in 1998 and focused on two goals: viz. to promote (a) science and technology literacy; and (b) the power of science and technology.

The momentum of the Year of Science and Technology was maintained through the incremental implementation of the National Science Week with effect from 2000. Activities of the National Science Week and other PUSET programmes have largely been implemented by the science centres.

In order to explore the potential of science centres to realize the goals outlined by the Science and Technology White Paper, the Department of Science and Technology commissioned two studies: (a) the survey on science and technology centres in 1999 and (b) the feasibility study on a network of arts and science centres in 2004.

Though appreciative of the immense potential of science centres, these studies found science centres in South Africa to be unevenly distributed and varied in terms of definition, ownership, size and capacity. Most were found to have been in operation for less than 5 years. Few were evaluated and had prepared annual reports with comprehensive budgets and actively marketed themselves.

The Department embarked on an extensive process of consultation which included workshops in all provinces, adoption of proposed Norms and Standards for a Network of Science Centres by a national conference attended by representatives of a broad spectrum of key stakeholders, adoption of the definitions in the Norms and Standards by the Vietnam International

Workshop on "The Changing Roles of Science Centres and Museums in Developing Countries" (see ***Annexure A****) and the International Science, Innovation and Technology Exhibition. It is gratifying that the Southern African Association of Science and Technology Centres presented a complimentary response to the proposed Norms and Standards.*

The Department is glad to release the National Norms and Standards for a Network of Science Centres as policy. This policy will guide the establishment of the Network of Science Centres in South Africa. It is hoped that this infrastructure will serve to help redress the historical legacy, support the building of a strong science culture and provide enriching interactive experience for the majority of people who have limited access to science, technology, engineering and mathematics.

INTRODUCTION AND BACKGROUND

The Department of Science and Technology identified a network of science centres as an important infrastructure required to achieve the science and technology goals identified by the White Paper on Science and Technology (1996) and the Research and Development Strategy (2002). In order to inform the development of an effective infrastructure that will be used to implement strategies of the Department to achieve the above-mentioned goals, the then Department of Arts, Culture, Science and Technology commissioned a study in 1999 to 'take stock of what was happening in science centres in South Africa'. The study found the following about science centres in South Africa:

- They were unevenly distributed, with the majority of historically disadvantaged in desperate need of this infrastructure.
- Their main purpose was to support schools and develop human resources.
- They generally focussed on school children and teachers.
- They largely existed in the following two forms: those with interactive exhibits and those with little or no exhibits but supported teaching and learning.
- Most lacked capacity to fulfil their roles.
- They were under-staffed and heavily dependent on part-time or volunteer staff.
- They generally closed on weekends.
- Most were not run in line with basic business principles.
- None had any form of external evaluation.

The study recommended a broad Government policy to support science centres to be co-ordinated centrally under a representative umbrella body linked to education at both national and provincial levels. It was also advised that the proposed body should be Government-funded and officially mandated to carry its duties; and raise additional funding from the private sector.

The study also recommended an impact assessment study to determine the impact of science centres and their roles in society. Between 1999 and 2004, in-depth discussions were held with key stakeholders and role-players on what the role of science centres in a post-Apartheid South Africa should be. During this period, the Department was advised to develop policy for science centres while involved in providing ad-hoc support to a small number of science centres.

In order to formulate a well-informed policy framework for a network of science centres in South Africa, the Department of Science and Technology commissioned a feasibility study in February 2004. The study had the following four phases:

(1) The audit phase
(2) The modelling phase
(3) The consultative and analytical phase
(4) The recommendations phase

Data collected during the feasibility study included literature review, interviews, questionnaires, personal visits to science centres in South Africa and abroad, ten workshops in all the nine provinces, a national conference, international workshop of developing countries on science centres in Vietnam and the International Science, Innovation and Technology Exhibition.

The findings of the feasibility study generally confirm those of the descriptive study of 1999. Furthermore, the feasibility study found the following:

- In the past five years science centres seem to have more than doubled in number.
- Most of the science centres were found to be less than five years old.
- Only 40% of the operating centres keep attendance records.
- Most centres mainly focus on general science.

- They have relatively few exhibits (66% had fewer than 50 exhibits while only four had more than 200 exhibits).
- They generally have under-utilised facilities and capacities.
- They have variable staff complement (ranging from 1 to 24 full-time staff and about 190 volunteers).
- They are variably owned (mostly by universities and parastatals and to a lesser extent, the private sector) and located (in museums, educational institutions, shopping centres, parks, research facilities, entertainment complex and community complexes).
- Competences are uneven (with fundraising and marketing being the poorest; and general management and education being the highest).
- Reporting is generally poor.
- Assessment and evaluation are largely non-existent.
- Sustainability is a major problem.

The above findings were presented in ten workshops conducted in all the nine provinces during the June-July 2004 period. Represented at these workshops were more than 70 key stakeholders and more than 200 participants. Although participation was not representative of the demographics of the provinces, valuable proposals were made and collated into the proposed norms and standards document that the national conference adopted on 22-23 August 2004.

Participants who attended all the provincial workshops overwhelmingly supported the establishment of a network of science centres in South Africa. The network was seen as a critical infrastructure required to address the shortcomings of the science, technology, engineering and mathematics (STEM) education and training system. The proposed Norms and Standards for a Network of Science Centres were also presented at the International Workshop on 'The Changing Roles of Science Centres and Museums in Developing Countries' held in Hanoi, Vietnam, on 20-22 October 2004. This international workshop adopted in their resolutions the definitions used in the Norms and Standards for the Network of Science Centres (see Hanoi Agreement in Annexure A). On 02 November 2004, the

International Science, Innovation and Technology Exhibition also supported the proposed Norms and Standards for a Network of Science Centres in South Africa.

THE VISION

South Africa inherited a system that produces a pitifully low number of graduates in science, technology, engineering and mathematics; especially among those from the historically disadvantaged backgrounds.

The post 1994 Government prioritised science and technology as key to socio-economic development and established a dedicated Ministry and Department of Arts, Culture, Science and Technology (DACST). The major achievements of DACST included the declaration of the White Paper on Science and Technology in 1996, the implementation of the Year of Science and Technology in 1998 and the National Research and Development (R&D) Strategy which was approved by Cabinet in 2002. The R&D Strategy identified 'frozen demographics' as a major challenge facing the National System of Innovation. It is against this background that Cabinet approved the separation of DACST into two distinct departments: viz. the Department of Science and Technology and the Department of Arts and Culture. In 2004, the President appointed two new Ministries for Science and Technology, and Arts and Culture respectively.

The vision and mission of Science and Technology is to 'create a prosperous society that derives enduring and equitable benefits from science and technology' and 'develop, coordinate and manage a National System of Innovation that will bring about maximum human resource capital, sustainable economic growth and improved quality of life for all' respectively.

A network of science centres is one component of a broader Departmental strategy to achieve the above vision and mission statements. The support for the use of this infrastructure is also part of a global strategy to use more than 1200 science centres

worldwide, which employ staff of more than 100 000, attract about 250 million visitors and inject into the economy about R10 billion, to increase the number of youth (especially those from disadvantaged backgrounds) who pursue careers in science, technology, engineering and mathematics.

GOALS

The Research and Development (R&D) Strategy and other Government Strategies such as the Human Resource Development (HRD) Strategy (DoE & DoL, 2000) and the National Strategy for Mathematics, Science and Technology Education (NSMSTE) (DoE, 2001) identified the following as key factors that impact on the development of adequate human resource capacity in the fields of mathematics, science, engineering and technology: (a) vicious under-supply of matriculants with quality passes in mathematics and science, (b) lack of financial support for those who wish to enrol for further studies in science, technology, engineering and mathematics (STEM) careers, and (c) a lack of inadequate facilities and resources to enhance effective teaching and learning.

To contribute towards addressing some of the above, the national conference supported the following as key goals to be achieved by the envisaged network of science centres:

- To identify, nurture youth talent and potential in STEM.

  South Africa inherited skills and competence disparities that result in the reproduction of skewed racial and gender hierarchies in the science system. The Network of Science Centres will use targeted interventions and programmes to contribute towards a more representative human resource base in STEM.

- To promote science literacy among the youth and the population in general.

  The new STEM curricula call for youth, learners and citizens who are imbued with

the values and act in the interests of a society based on respect for democracy, equality, human dignity and social justice as promoted in the Constitution.

The youth, learners and citizens emerging from new curricula must demonstrate achievement of the Critical and Developmental Outcomes; especially the Critical Outcome to use science and technology effectively and critically showing responsibility towards the environment and the health of others.

To achieve this goal, the Network of Science Centres must ensure that the youth, learners and citizens:

- *have access to, and succeed in, lifelong education and training of good quality;*
- *demonstrate an ability to think logically and analytically, as well as holistically and laterally; and*
- *are able to transfer skills from familiar to unfamiliar situations.*

- To enhance learner participation and performance STEM.

The system of education is characterised by an unacceptably low output of mathematics and science graduates at the exit points, and a pitifully low number of qualified teachers in mathematics and science education. To respond to this crisis, the Network of Science Centres will develop and implement curriculum support programmes that seek to break this vicious cycle of mediocrity by increasing enrolments and performance - of especially the historically disadvantaged learners - in Higher Grade Mathematics and Physical Science (or equivalent standards in the new curricula).

- To provide career education in general and STEM in particular to the youth.

Career guidance lost its status as a non-examinable subject. In the new curriculum statement, it is replaced by Life Orientation which is designed to equip the youth with knowledge and skills to make informed decisions about their future careers. The Network of Science Centres will provide career education programmes that prepare learners and the youth to respond effectively to the need for more quality information and career awareness. In implementing these programmes, the Network will increase awareness of STEM careers by using exciting methods and activities such as displaying indigenous creations and innovative camps, expos, festivals and olympiads.

Although all science centres should, as a minimum requirement, achieve the above three broad goals, specific local objectives such as tourist attraction, improvement of inner city decay, resuscitation of depressed areas, rural development and urban renewal could be accommodated in the network.

DEFINITIONS

The studies conducted by the Department of Science and Technology found that the concept of a science centre is variedly interpreted. The 1999 study describes "science centres as collections of interactive science exhibits in galleries or exhibitions at more traditional museums, each of which is designed to represent an idea or concept". The feasibility study of 2004 found that internationally a science centre is defined as a "permanently established educational facility that offers an informal educational experience in science, technology, engineering and mathematics (STEM) by providing interactive exhibits and displays; and interactive programmes".

The above definitions excluded the so-called science resource centres that mainly support teaching and learning through facilities such as libraries, computer rooms and career education centres. The above definitions were therefore, found to be narrow and limiting as they could not address the main challenges facing mathematics, science and technology

education in South Africa; viz. increasing enrolments and quality passes in mathematics and science.

The provincial workshops and the national conference adopted the following inclusive and broader concept of a science centre: “a science centre is a permanently established education facility that provides an interactive educational experience through the use of interactive science, technology, engineering and mathematics exhibits, displays and programmes”.

In broadening the definition, the following notion of ‘interactivity’ was unpacked and understood to cover exhibits and displays that can be handled and require a response, which ideally should be manual, mental, emotional and social. Given this definition of interactivity, interactive exhibits could include the environment and botanical gardens. Interactive exhibits and displays would be used to excite and entertain, as well as link educational experience to learning outcomes. Care will be taken in the design and development of exhibits to cater for the needs of all, especially the disabled.

A network of science centres, therefore, would refer to a group of science centres that are interconnected, aligned to and supported by the Department of Science and Technology (DST). Voluntary networks that do not fit the above definition shall not be part of the DST network.

In the context of a network of science centres, “science” shall include natural sciences, biological sciences, life sciences, technology, engineering and mathematical sciences.

The envisaged network of science centres accommodates a variety of science centres in its network to achieve the above-mentioned four broad goals. This includes science centres with specialist and generic designs, full-service and limited service science centres, as well as mobile and stationary science centres. This classification enables different variations of science centres to exist in the network..

Science centres are mostly designed to serve general science programmes and very few have thematic designs. As focus shifts more towards improved learner participation and performance, discipline-specific and curriculum relevant interactive exhibits and displays would be required.

PRINCIPLES

The network of science centres in South Africa shall be underpinned by the following five principles:

- **Access, redress and equity**

  The Constitution of South Africa forms a basis for transformation of science, technology, engineering and mathematics (STEM) in a post-Apartheid society. The imperative to transform STEM stems from a need to address the legacy of Apartheid, the imbalances of the past on one hand and ensure equal educational opportunities for all sections of our population. The Network of Science Centres shall be strategically positioned and structured to ensure that all benefit from the interactive educational experience offered by science centres.

- **Key performance indicators-driven delivery**

  The Network of Science Centres adopts a performance indicators-driven approach by specifying minimum requirements for science centres. Such indicators are developed and comparable to those designed for the science system. Quality is to be assured through national and provincial moderation, among other mechanisms.

- **Outcomes-based Education**

Outcomes-based education forms the foundation for the curriculum in South Africa. It strives to enable all learners to reach their maximum learning potential. This it does by setting the outcomes to be achieved at the end of the process. The outcomes encourage a learner-centred and activity-based approach to education. This approach will underpin all the programmes to be implemented by the Network of Science Centres.

- **Valuing Indigenous Knowledge Systems**

Science, technology, engineering and mathematics are premised on the view that there are competing perspectives and worldviews from which to understand and make sense of phenomena. STEM curricula based on this view requires that these different perspectives and worldviews be recognised in the curriculum. In our context, the recognition and valuing of indigenous knowledge systems is crucial for affirming a great majority of our people. Indigenous knowledge systems incorporate ways of doing and thinking associated with indigenous local communities in our country, region and continent. The Network of Science Centres shall integrate elements of indigenous knowledge into their discursive programmes.

- **Sustainability**

The Network of Science Centres will sustain itself through self-dependence, synergy and ownership. The Network will strive to be less dependent by building into their plans income-generating programmes; synergise efforts to minimise duplication and negative competition; and ensure ownership through community participation and involvement. Such ownership and demonstrable political buy-in must enable science centres to market themselves and manage their own finances.

NORMS AND STANDARDS

Geographic size and space

The geographic space of science centres ranges between 50 and 4000 m². Only a few science centres indicated that their space was fully utilised although many said their facilities were inadequate.

Most science centres offer less than 50 exhibits and are guided. Only a few have more than 200 exhibits and displays. Capacity to develop and renew relevant exhibits is generally low.

Science centres shall have the following minimum size and space standards:

- The network of science centres shall aim by 2020 to be able to provide about 3,75 million experiences a year to South Africa's 15 million school children..
- Normatively, a full service science centre of 1 800 m^2 size should be able to cater for 50 000 school visitors in groups.
- A community of 200 000 students deserves to benefit from being served by a full service science centre, subject to this centre being within easy reach (say) 100 kilometres. Depending on location, such centres may also be able to attract up to an equal number of other visitors (e.g. children out of school, family groups and tourists).
- A limited service science centre of 600 m^2 size should be able to serve 25 000 children a year in school groups.
- A mobile science centre should be able to reach 50 000 students a year, focusing on rural and remote communities.
- The number and types of interactive exhibits and displays shall be geared towards increasing interactive educational experience and achievement of learning outcomes.
- Science centres shall make room to cater for future expansion and outdoor environment
- A balance will be struck between quantity and quality of all the components that make up a science centre.
- Science centres shall ensure that access requirements for disabled visitors are addressed.

Location and ownership

Science centres in South Africa are unevenly distributed, variably located and owned. Many are owned/managed by educational institutions and parastatals. They are variably located in museums, shopping centres, office complex, theme park, research facility, entertainment/sporting complex, community complex and provincial parks. Only one science centre is freestanding.

The following shall serve as criteria for locating science centres:

- Each province shall have science centres in the energy nodes to serve a critical mass of people; especially the youth and learners.
- Disadvantaged areas with critical mass will be prioritised.
- Local ownership including abilities and capabilities to secure and safe-guard the facility shall be prioritised.

Attendance

Science centres operate between five and seven days per week while the schedule of mobile resources depends on school terms and other events. Only four centres keep a detailed attendance record. However, all but one science centre was able to provide total attendance for 2003 and attendance ranged from 400- 142 000. The 20 centres including five mobile resources reached about 518 000 people in 2003 - about 335 000 (65%) were children. Improvements in recording attendance would help individual centres/mobiles and those seeking an overview of the sector.

All science centres shall adhere to the following attendance requirements:

- All science centres will keep attendance records of learners and experiences including those visiting or using mobile components of science centres.
- Incentives will be used to encourage attendance and higher interactive educational experience.
- A minimum standard for attendance shall match the size of the centre.
- Learners and their educators will visit the science centre at least once in their schooling career.
- Every science and technology educator will visit the science centre at least once a year in each schooling band.
- The board of governors in consultation with local communities shall determine entrance fees.

Staffing

Staff employed by science centres range from one person to 24 people per centre. The 20 science centres employ a total of 159 people but also have 190 volunteers. Most centres/mobiles regard their general management and education skills as being good, administration adequate and their fundraising and marketing as adequate to poor. 50% of science centres indicated that their staff were fully utilised but most said they needed more staff.

The following shall serve as staffing criteria:

- Employment of staff shall be driven by the aims of the science centre.
- Redress and equity principles will drive employment of staff.
- Every science centre shall have a permanently tasked manager.
- The number of permanently employed staff shall depend on the budget, size and load. One facilitator for 10 000 visitors should serve as a guide.
- Employment of temporary staff shall depend on the ability of the science centres to attract funding.

- The options of secondment, internships and learnerships are recommended as mechanisms to attract staff.

Financial Management and Funding

Less than half the number of science centres prepares annual reports and detailed breakdown of operating income and expenditure. The highest income earned by a science centre is R3.3 million. Income, in part, reflects entrance fees which range from an upper level of R 24/R20 for adults/children to a level of R5 for adults/children. Two science centres do not charge entrance fees. Overall, the private sector appears to provide substantially more than the public sector toward operating income.

In general, science centres that form part of a museum, parastatal or university, are cross-subsidised. Major financial components like salaries, maintenance and administration generally do not form part of a budget and are covered elsewhere in the institution.

Due to the scarcity of recorded data, analysis of visitor attendance is difficult to obtain. It may be concluded that accurate financial information may not be important to many owners/operators of science centres. Such science centres are likely to be considered only as a part of or add-on to their main activities.

Many science centres indicate that they have never been adequately funded, that they need to scramble to secure additional support and that they are forced to curtail programming and staffing to make ends meet. However, in spite of these difficulties their continued existence, often over many years, is evidence that most are largely sustainable. Nevertheless to fully assess the general viability and sustainability of science centres/mobile resources, it would be necessary to be assured of improvements in financial reporting.

Financial accountability is generally best achieved through the services of an auditor. The majority of centres (70%) prepare a budget and a strategic/business plan (60%). Few

however conduct market surveys or produce marketing plans. Many would appreciate Government funding for operating costs and the setting up of new science centres in areas where they do not exist.

To put the network on a sound financial footing, the Department will:

- Use a determined formula to cover operational costs depending on the developmental stage of the science centre.
- Use incentive costs to incubate new science centres and, in collaboration with private sector, provide initial 100% support to new science centres and reduce the support over a period of three years.
- Use Grants-in-aid fund to support some of the projects to be offered by the network.
- All science centres shall operate on sound financial management principles in accordance with legislation such as the Public Finance Management Act and the Municipal Finance Management Act.
- Encourage science centres to strive for financial self-sustainability through cross-subsidisation.
- Audit books, develop strategic and business plans and annually report on their financial performance.
- Develop financial management measures (e.g. procurement procedures, asset management, finance policy) with forecasts.

Monitoring, Evaluation and Research

Only 50% of centres undertake customer surveys, fewer than 30% undertake internal reviews and only one has sought an independent assessment. It must be concluded that improvements should be achieved in these areas.

To ensure on-going reflection and improvement, the network will:

- Be monitored and evaluated annually against the set key performance indicators.
- Solicit on-going feedback from visitors.
- Conduct on-going annual impact assessments.
- Use information technology infrastructure to facilitate data gathering and storage.

Partnership and networking

Most science centres have developed partnerships with other science centres nationally and internationally. Fourteen of them are members of SAASTEC but costs preclude all but one from joining an international network.

Ten science centres have links and partnerships with other institutions, usually a local university to assist with teacher training. However, links with arts and cultural organisations are limited, the majority being in KwaZulu-Natal and few centres involve the wider community in their operations.

- The Collaboration Agreement signed by the Departments of Science and Technology and Education provides an enabling framework for the Network of Science Centres (see **Annexure B**).
- The Department will create partnerships with key players to mobilise support and resources to sustain the work of the network of science centres.

Implementation

The DST agreed to provide programmatic support to a few science centres in South Africa. Out of the 13 science centres that received programmatic support in the 2004/5 financial year, three science centres received seed funding to set up new structures. Others used the financial support to cover programmatic costs. This form of support served as a pilot for the envisaged network of science centres.

DST will use its pilot experience to facilitate the establishment and maintenance of the network of science centres using a phased and incremental approach. It will exploit its formal collaboration with the Department of Education to meet the targets included in the National Strategy for Mathematics, Science and Technology Education.

The following steps will be undertaken in the first year of implementation:

- A national task team will develop a detailed 5-year implementation plan. The implementation plan will cover items such as funding, capacity, monitoring, research, advocacy, communication and positioning of new science centres.
- Although different types of governance structures will be adopted for different types of science centres, each science centre will appoint a management committee chaired by a full-time manager.
- The manager of each science centre will report to a representative board of governors.
- The network will be coordinated through a national consultative body that would convene planning meetings at most twice a year. This body will comprise, among others, elected representatives from the board of governors.
- The national consultative body/forum will also monitor the performance of the network.
- The Department of Science and Technology will use its systems to secure and disburse funds to the network.
- While the formal collaboration entered into by the Departments of Education, and Science and Technology will benefit the establishment of the Network of Science Centres, further collaborations of different types will be entered into with different stakeholders and role-players to strengthen the Network.

Sustainability

Major problems facing science centres that impact negatively on sustainability include lack of financial sustainability, low staff capacity, vandalism/theft and linguistic skills.

To be sustainable, the network of science centres will:

- Receive support for operational costs from Government through a set formula.
- Promote synergy and partnerships.
- Avoid duplication of resources and efforts by using, among others, un(der) utilised facilities and resources.
- Ensure accountability.
- Develop strategies to leverage resources to sustain science centres. Such strategies could include cross-subsidisation, official formula to determine entrance fees and the use of market-driven research to decide interventions required to meet the needs of visitors.
- Ongoing capacity building programmes. Exploit learnerships to build capacity as well as make use of unemployed science graduates.
- Marketing science centres and embarking on awareness raising campaigns.

REFERENCES

Department of Arts, Culture, Science and Technology (1996) **White Paper of Science and Technology**. Pretoria (SOUTH AFRICA)

Department of Arts, Culture, Science and Technology (1999) **Science and Technology Centres in South Africa: A Survey Conducted by the Human Sciences Research Council**. Pretoria (SOUTH AFRICA)

Department of Arts, Culture, Science and Technology (1999) **Feasibility Study for the Establishment of a Network of Science and Arts Centres in South Africa**. Pretoria (SOUTH AFRICA)

Department of Education (2001) **National Strategy for Mathematics, Science and Technology Education**. Pretoria (SOUTH AFRICA)

Departments of Education and Labour (2000) **National Human and Resource Development Strategy**. Pretoria (SOUTH AFRICA)

Department of Science and Technology (2002) **National Research and Development Strategy**. Pretoria (SOUTH AFRICA)

ANNEXURE A: HANOI RESOLUTIONS

THE INTERNATIONAL WORKSHOP ON 'THE CHANGING ROLES OF SCIENCE CENTRES AND MUSEUMS IN DEVELOPING COUNTRIES'

HELD IN HANOI, VIETNAM,

ON 20-22 OCTOBER 2004

The Hanoi Resolutions

While expressing gratitude to Vietnam, the hosts of the international workshop on 'The Changing Role of Science Centres and Museums in the Developing Countries' jointly held by the Ministry of Science and Technology, Hanoi, Vietnam and the NAM S&T Centre during October 20-22, 2004, we, the participants of the workshop resolve that:

1. Science centres shall cover science, technology, engineering and mathematics. These will refer to a permanently established education facility to provide an interactive educational experience through the use of interactive exhibits, displays and programmes.
2. The interactive nature of the science centres and museums represent a unique opportunity to spread scientific awareness, promote non-formal science education, promote scientific literacy and provide life-long learning opportunities for people in science.
3. In accordance with para 48 of the Science Declaration adopted at the World Conference of Science organized by UNESCO / ICSU in Budapest, Hungary in June 26 – July 1, 1999, governments, international organizations and relevant professional institutions enhance or develop programmes for the training of journalists in science communicators and all those involved in increasing public awareness of science.
4. In pursuence of the Kolkata Declaration of 2002 a regional Latin American/Carribean workshop was organized in Colombia, Latin America in March 2004 and the second international general workshop on science centres for all developing countries has been organized in Hanoi, Vietnam in October 2004; More science centres in NAM and other developing countries have been established; Role of science museums and centres as important elements in public education in science has been promoted; and individual experiences through the quarterly newsletter and website of the NAM S&T Centre have been shared.
5. National authorities and funding institutions shall promote the role of science centres and museums as a vital element in public education in science, and that we shall pursue this with concerned authorities in our respective countries.

6. Science centres in developing countries shall ensure efficient record keeping, conduct regular impact assessments and report progress at regional and general workshops. The NAM S&T Centre will facilitate fund-raising by approaching funding agencies such as UNESCO and UNDP, and other funding agencies and NGOs.There is a need to establish a network among science centres, museums and other institutions engaged in science popularization in the developing countries for effective sharing of learning experiences, and that the quarterly Newsletter of the NAM S&T Centre and its website (www.namstct.org) will report on the developments on the activities of the science centres and museums in the developing countries.

7. Development of science centre and museum related regional programmes will be undertaken by the member countries of the NAM S&T Centre and other developing countries grouped in three regions, with Focal Points Prof. Dayananda Bajracharya of Nepal for the Asian region, Mr. Festers Hangandu Mungo of Zambia for the African and Middle East region and Mrs. Dr. Nohora Elizabeth Hoyos of Colombia for the Latin American region.

8. Reviews for assessing impact of science popularization programme is extremely important for which we may seek the help of the NAM S&T Centre for approaching the international funding agencies like UNESCO, UNDP and also non-governmental organizations / private sector for organizing workshops and undertaking such studies with the support of the NAM S&T Centre.

9. Programmes of Science Centres and Museums in the developing countries may include awareness about and utilization of the traditional knowledge / media for science communication.

10. Member countries of NAM S&T Centre may encourage distance learning networks for science communication enabling teachers, students, science centres, museums and other institutions to interact with each other incorporating innovative approaches, internet resources, etc.

11. Exchange of personnel between developing countries for providing training in science popularization activities, including the development of exhibits shall be encouraged.

11a. The National Council of Science Museums (NCSM), India offered training facility free of cost with individual participants bearing all other expenses.

11b. NCSM, India proposed to offer its Mobile Science Exhibition buses, or help develop an exclusive Mobile Science Exhibition Bus, to the member countries of the NAM S&T Centre on cost basis.

11c. NCSM, India also mentioned about its plan of launching a two-year masters degree course on science communication for science museum/centre professionals efffective from July 2005. Interested countries may contact NCSM for deputing participants for the course on cost basis.

11d. In view of the importance of India's National Children's Science Congress in encouraging school children to take up investigative science projects, similar activities may be taken up in other developing countries as well. Initially, the nodal agencies of the Government of India like Vigyan Prasar and National Council for Science and Technology Communication (NCSTC) offered to partly support the participation of one/two school children with one teacher as participants-cum-observers from developing countries subject to approval by the Government of India.

11e. National Science Centre, Malaysia offered training faclitity in Science Enrichment Programme free of cost with individual participants bearing all other expenses.

12. In view of the fact that extensive science popularization activities are required in the rural areas of most developing countries, assistance and help be extended to a country where it is needed by the other member countries. Awareness programmes / software could also include development of a variety of software on issues like environment, biodiversity, health, medicine, water resources, information technology and so on.

13. More of such workshops shall be held in future on science centres and museums for all developing countries once every alternate year, and a regional workshop during the intervening period.

Zambia / Sudan offered to host the regional conference in 2005 subject to the approval of their respective governments. They will inform the NAM S&T Centre about the venue, date etc. after mutual consultations between themselves and the Centre.

The Royal Nepal Academy of Science and Technology (RONAST) proposed to host a meeting on Science Centres and Museums in the year 2006-2007,subject to the successful establishment of the proper science learning centre in Nepal.

Signatories

Algeria	**Bangladesh**	**Egypt**	**India**
Indonesia	**Malaysia**	**Mauritius**	**Nepal**
Pakistan	**Sri Lanka**	**South Africa**	**Sudan**
Vietnam	**Zambia**		
	CRD, MOST	**NAM S&T Centre**	

ANNEXURE B: DST/DOE COLLABORATION AGREEMENT

COLLABORATION BETWEEN THE DEPARTMENT OF EDUCATION AND THE DEPARTMENT OF SCIENCE AND TECHNOLOGY IN THE IMPLEMENTATION OF THE NATIONAL STRATEGY FOR MATHEMATICS, SCIENCE AND TECHNOLOGY EDUCATION

COLLABORATION AGREEMENT

1. PURPOSE

To outline the collaboration between the Department of Education and the Department of Science and Technology in the implementation of the National Strategy for Mathematics, Science and Technology Education.

2. BACKGROUND

2.1 In November 2003 the Directors General of the Departments of Science and Technology and Education agreed to collaborate on the implementation of the National Strategy for Mathematics, Science and Technology Education.

2.2 On 28 January 2004, Cabinet approved the following eight objectives to consolidate, deepen and widen the National Strategy for Mathematics, Science and Technology Education:

- setting performance targets for all mathematics, science and technology schools, especially African and girl learners;
- placing in every mathematics, science and technology classroom a qualified and competent teacher;
- improving the language of teaching and learning mathematics, science and technology;
- identifying and nurturing talent and potential in mathematics, science and technology ;

- entering into partnerships with relevant stakeholders to raise the required resources and mobilise technical support and expertise;
- evaluation and monitoring of programmes in mathematics, science and technology education;
- making interactive digital content on mathematics, science and technology available via satellite, television, internet, multimedia, print supplements and the educational portal; and
- strengthening the co-operation between the Departments of Science and Technology and Education in delivering the objectives of the Strategy.

3. COLLABORATION BETWEEN THE TWO DEPARTMENTS

3.1 In November 2003, the Departments of Science and Technology and Education agreed on supporting the consolidation, deepening and widening of the National Strategy for Mathematics, Science and Technology Education.

3.2 In order to achieve the above-mentioned objectives, the two Departments will collaborate on the following, focussing on mathematical subjects, physical and life sciences, and computer and engineering subjects in the current and the new curricula:

a. educator development to upgrade their knowledge and skills;
b. enhancing learner participation and performance;
c. identifying and nurturing talent and potential;
d. placing and supporting learners in higher education and key strategic economic sectors; and
e. supporting curriculum delivery.

It further agrees to:

f. conduct research to support the implementation of the National Strategy for Mathematics, Science and Technology Education;

g. utilise available resources of the two Departments in support of the implementation of the Strategy; and
h. collaboratively advocate and communicate the objectives of the Strategy.

4. MANAGING THE COLLABORATION

4.1 The Department of Education's Schools and Curriculum Innovation Chief Directorate and the Department of Science and Technology's Science Missions and Human Capital Sub-Programme will give effect to the implementation of this collaboration agreement through a joint task team that will develop and oversee implementation.

4.2 The Department of Science and Technology will be represented on the Inter-Provincial Task Team that co-ordinates and manages the implementation of the National Strategy for Mathematics, Science and Technology Education.

4.3. Planning and reporting will be carried out by the two Departments through normal line functions

Progress reports on the implementation of the National Strategy for Mathematics, Science and Technology Education will be provided to the respective Departments, the Inter-Provincial Task Team and HEDCOM.

Signed by:

……	……
Mr T Mseleku: DG – Education	Dr R Adam: DG – Science and Technology
Date: 6 July 2004	**Date**: 6 July 2004

(DST_DMLIB-#38813-v1-Final_Draft__DST-DoE_MoU.DOC)