science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

NATIONAL SCIENCE WEEK IMPLEMENTATION STRATEGY

(2013 - 2017)

Developed by: Science and Youth Unit

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1 BACKGROUND

1.1 Policy and strategic perspective

The White Paper on Science and Technology (1996) seeks to build an effective National System of Innovation (NSI) that advances both social and economic development priorities of the country. The process towards an effective and successful NSI depends on among others, the participation of all South Africans, which in turn requires a society that understands and values science, technology and innovation (STI), as well as their critical roles in ensuring national prosperity and a sustainable environment. In this context, the Department of Science and Technology (DST) established a national campaign to promote public awareness of and engagement with STI. The primary goal of this campaign is to promote science and technology literacy, as well as their pivotal role in addressing issues affecting people (i.e. promoting the power of STI).

Beside the aforementioned primary goal, the DST's campaign for promoting public awareness of and engagement with STI has the following sub-goals: (a) to increase people's familiarity with the natural world; (b) to enable people to understand some key concepts and principles of STI; (c) to enable people to perceive STI as social tools.

The DST's campaign to promote public awareness of and engagement with STI comprises several initiatives. These are driven by different sections of the department. The implementation approach adopted by the DST allows each division of the department to promote public awareness of and engagement with STI initiatives that are related to the mandate of the division. The overall DST's campaign is complemented by the work of other stakeholders, role players and interest groups within the NSI. These include science centres, higher education institutions, science councils and other government departments.

Initiatives that are part of the DST's campaign to promote public awareness of and engagement with STI include the annual National Science Week (NSW).

1.2 The National Science Week

1.2.1 Description of the National Science Week

The NSW is an annual countrywide celebration of science, technology, engineering, mathematics and innovation (STEMI) led by the DST, where various stakeholders, role players and interest groups collectively conduct activities that promote general awareness of the value of STEMI to people's daily lives.

1.2.2 Objectives of the NSW

The objectives, which the NSW sought to address over the past years have been revised and reduced from 5 to 4:

- to popularise science to the broader South African society,
- to serve as a vehicle for showcasing local innovations in science and technology, and the leadership role of the DST and other government departments in enabling research, development and innovation,
- to make STEMI appealing to learners, such that they consider SET as preferable career options, and
- to familiarise targeted participants with the science linked to areas in which South Africa has knowledge and/or geographic advantage so as to contribute in making them informed and critically engaged citizens.

1.2.3 Historical background of the NSW

South Africa is among many other countries in the world that conduct a science week. The DST started conducting its science week in 2000. Based on continuous evaluation and upholding the principle of continuous improvement, the NSW has since its inception adopted three different implementation models. The first three years (2000-2002) followed a tri-provincial model where the NSW was celebrated on a single site in only three provinces per annum. This was followed by a two-year period (2003-2004) where each province had a main site hosting the NSW activities. The period 2005 to current is

characterised by an approach where the activities celebrating the NSW are conducted in multiple sites across the nine provinces.

In taking forward the principle of continuous improvement, a Ten-Year Review of the NSW was conducted in 2011. The Review, which focused on the first ten years of the NSW (2000-2009), sought to: (a) assess the impact of the NSW in terms of meeting its objectives, including the difference the initiative has to the people; and (b) establish factors, (for instance, best practices, weaknesses, and achievements) which in different ways could contribute to improved implementation processes of future editions of the NSW.

1.3 Goals of the Strategy

This document constitutes a five-year (2013-2017) project implementation strategy for the NSW. It is a high-level guideline for the development of actual activities, which will be conducted to celebrate the NSW. The document will also guide the development of an operational road map, which will be done by the implementing agency of the NSW. The strategy takes into consideration the findings of the Ten-Year Review, lessons learnt from the past, as well as relevant developments within the DST and the broader NSI. The project strategy seeks to:

(a) provide guidance to stakeholders or target participants' and interest groups' ways of contributing to the objectives of the NSW,

(b) change the perception that developed over the past years that the NSW is an initiative for school-based youth only,

(c) broaden, consolidate and deepen the gains made since the inception of the NSW in 2000, and

(d) encourage people to participate in the NSW from wherever they are, even if their circumstances deny them to be at the formal sites hosting the initiative's activities.

2 PROJECT IMPLEMENTATION APPROACH

2.1 Target participants

In order to maximise citizens' participation in the NSW, sections of the population and entities in the society that will be targeted for participation have been identified:

(a) learners in the schooling system,
(b) higher education institutions,
(c) science centres, natural history museums and interpretation centres,
(d) science councils (including National Research Facilities),
(e) media,
(f) general public,
(g) politicians or decision-makers,
(h) government departments involved in scientific and technological activities (STAs), and
(i) industry.

2.2 Timing

The NSW will be celebrated annually during the first week of August. The implementation of the last three editions of the NSW (2009 to 2011) was accompanied by heavy publicity, which, undoubtedly made people to associate August with the NSW.

2.3 Determining key messages to be communicated

The key messages that will be developed and communicated in the build up to and during the NSW will be informed by the above-mentioned objectives, theme and sub-themes of the NSW.

(a) Theme of the event

The theme of the NSW will change annually. The DST may request selected stakeholders of the society to choose or recommend the theme for a particular year. Some of the stakeholders that may be considered for this purpose are media (through the South African National Editors' Forum - SANEF), higher education sector (through the National Science Deans Forum - NSDF), science centres (through Southern African Association for Science and Technology Centres - SAASTEC); science councils (through the Committee of Heads of Research and Technology - COHORT) and organised labour (through three major labour federations that form labour constituency at the National Economic Development and Labour Council).

(b) Sub-theme

South Africa recognises activities of the United Nations (UN), which has a practice of designating international years as a way of drawing attention to major issues and encouraging international actions to address concerns that have global importance and ramifications. Where the designated year is of scientific significance or relevance, it will be included as a sub-theme of the NSW.

In the same context of the foregoing paragraph, issues highlighted by the regional bodies of which South Africa is a member, like the African Union (AU) will also be considered as a sub-theme of the NSW.

2.4 Involvement of target participants

This section of the project strategy provides some guidelines on how identified sections of the population and entities in the society can participate in the NSW. The strategy does not provide an exhaustive list of means and opportunities of participating in the NSW, therefore all the participants are encouraged to be creative and develop additional or other ways of celebrating the NSW. In reaching out to non-traditional audiences, the sections of

the Department which stand to benefit will take a lead in reaching out to those audiences while the NSW machinery will provide the necessary publicity, available infrastructure, and coordination.

(a) higher education institutions

Higher education institutions are an important component of science and technology knowledge production hub. These institutions are also integral to the production and nurturing of innovators and human resources in science, technology, engineering and mathematics (STEM). Currently, South Africa has 23 higher education institutions and less than 50% of them have at any given year participated in the NSW.

- *University students*: One of the key Department's objectives in this regard is enhancing the recruitment of designated groups into research careers, in particular scarce skills areas in SET. The DST and NRF's Human Capital Development, and the respective DST priority areas sections will take a lead in engaging this section of the population. University students usually establish study fields-based student associations, for example, there is a Postgraduate Students Association for Natural and Agricultural Sciences at the University of Pretoria (PSANA). In universities where such associations exist, they will be requested to develop a programme of action to participate in the NSW.
- Scientists in academia will be encouraged to organize seminars, workshops and public lectures focusing on topics of their choice that are related to the theme or sub-themes of the NSW. The focus could also be on any of the DST's priority areas or science of the problems that the country and/or world are attempting to tackle (e.g., global change). Scientists wishing to organize seminars, workshops or lectures will be able to access grant funding for that purpose.
- Writing newspaper and magazine articles or opinion pieces, as well as featuring for electronic media interviews is another way in which scientists in academia would contribute to the NSW. The costs associated with

such exercises will be re-imbursed. Scientists offering to contribute in this way will be entitled to honoraria.

- Universities can invite best performing (mathematics and physical science) grades 8 to 12 learners in their catchment area to spend a day on campus. This should preferably be done during a weekend, unless the relevant education authority has authorized the participation of learners during normal learning hours.

The involvement of scientists in the above-mentioned manner will be facilitated through among others, the South African Higher Education Community Engagement Forum (SAHECEF) and the South African National Science Deans Forum. However, where there are partnership projects between the DST and a higher education institution, the project line directorate of the DST will facilitate the involvement of the partnership project in the NSW (e.g. the involvement of the Centres of Excellence will be facilitated by the High End Skills Unit).

(b) National science councils and related institutions

Just like higher education institutions, South Africa's science councils are integral to science and technology knowledge generation and exploitation, which in turn is a key driver of innovation. The national government invests a significant level of funding in science councils; however, it is believed that many South Africans are less informed about what these institutions do. Science councils and related institutions in question here are: (i) Council for Scientific and Industrial Research - CSIR; (ii) Council for Geosciences - CGS; (iii) Agricultural Research Council - ARC; (iv) Council for Mineral Technology - MINTEK; (v) Human Sciences Research Council - HSRC; (vi) Medical Research Council - MRC; (vii) Water Research Commission - WRC; (viii) South African Nuclear Energy Corporation - NECSA; (ix) South African National Space Agency - SANSA; (x) Technology Innovation Agency; (xii) South African Weather Services - SAWS; and (xiii) National Research Foundation - NRF, including its national research facilities.

- The involvement of the national science councils in the NSW will among others, create public awareness about their role in STI, as well as create an environment for scientists based at these institutions to communicate with various sections of the society. In particular the critical audiences for the science councils are industry partners and government departments which require technological solutions to improve service delivery. The Committee of Heads of Research and Technology (COHORT) will take a lead in organising activities associated with these relevant stakeholders, while the NSW machinery will provide the necessary publicity, available infrastructure, and coordination. Science councils will be another source of scientists who will write newspaper and magazine articles, as well as present themselves for electronic and print media interviews. In addition, seminars, workshops and roundtable discussions, among others could also be used to communicate science and technology.
- Publicity of the work of science councils and national facilities (including science-based careers that are relevant to these institutions) will be captured in brochures and DVDs that will be distributed at strategic points and visitors to the institutions. Where such materials already exist, resources will be made available for the production of additional copies.
- Another attempt to familiarise people with the work of the science councils and national facilities will be through family open days. Since the NSW overlaps between two weekends, science councils and national facilities will hold open days during the weekends.

Some of the scientists who participated in the NSW Ten-Year Review study indicated that communicating science to the public is not part of their work, while some felt that absence of incentives is responsible for their failure to participate. In this regard, participation of scientists in any of the ways suggested above will be voluntary.

Participation of science councils will be facilitated through the Committee of Heads of Research and Technology (COHORT). With regard to the National Research

Facilities (under the NRF), there is already an existing structure that coordinates overall advancement of science and technology within the NRF.

(c) Learners in the schooling system

Just above 1.3 million people participated in the NSW over the period 2005 to 2011. About 86% of these were school learners, mainly in the secondary schools. Priority was given to the 500 Dinaledi schools, although a limited number of public schools that were not part of the Dinaledi Schools Project also participated. According to the latest available statistics, in 2007 South Africa had 12,325,364 pupils enrolled in both public and independent schools. The NSW implementation approach used to date did not create sufficient capacity for the majority of the learners in the schooling system to participate.

The approach outlined below will maximize the participation of learners in the NSW without disrupting the teaching and learning. Learners will not have to leave their schools in order to participate in the NSW activities; instead, they will participate in the NSW within their schools and only after the official school hours.

- Local scientists will be invited to develop safe and fun experiments and games that learners can perform or play at their schools. The experiments will mainly use recyclable materials or materials that are easy and cheap to acquire. There will be experiments for primary and secondary school learners. Incentives will be provided to scientists who develop new experiments and/or adapt readily existing experiments for local use. Experiments guidelines will be distributed to all schools. The distribution strategy for the materials to public schools will be developed in consultation with the Department of Basic Education and its provincial counterparts. Regarding distribution to independent schools, guidance will be sought from the Independent Schools Association of Southern Africa (ISASA).

At the end of the five-year period (2013-2017), all the experiments developed by local scientists will be put together to produce a compendium of fun and stimulating experiments for learners. Scientists who made a contribution to the development of the booklet will be acknowledged in the publication.

- Part of the DST's National Youth Service programme (NYS) entails deployment to schools of young professionals in STEM careers. They will motivate and share information about their careers with the learners. A database of professionals who are prepared to voluntarily visit schools for that purpose is maintained by the South African Agency for Science and Technology Advancement (SAASTA), which implements the NYS. Through the NYS programme, STEM professionals will be deployed to public secondary schools across the country to provide mentorship and act as role models.
- Exposing learners to STEM careers is an integral part of the process to build STEM human capital pipeline. STEM career information materials will be distributed to schools.

(d) Government departments

Additional to the DST, which is the custodian of the South African White Paper on Science and Technology (1996), there are 24 other government departments, which are directly and/or indirectly involved in scientific and technological activities (STAs). In 2009/10, the 25 national departments' expenditure on scientific and technological activities amounted to R14.8 billion.

- *The DST*: Each directorate in the DST leads STI awareness initiatives that are aligned to its mandate and objectives. Any directorate of the DST with STI awareness initiatives or other initiatives, which can advance the objectives of the NSW, will ensure that such initiatives are incorporated into the NSW programme. The Emerging Research Areas Unit, which runs the nano science and technology awareness programme, is an

example of a directorate with STI awareness initiatives, while the High End Skills Unit through its Centres of Excellence programme is an example of a directorate whose activities can advance the objectives of the NSW.

- *Other government departments with STAs:* Two ways in which these departments will enhance the NSW have been identified: (i) some of the departments conduct science-based awareness activities. Such departments will be requested to use the NSW as another vehicle of conveying messages they seek to take to the people. The Department of Environmental Affairs for instance, can use the NSW to disseminate further information on its existing Global Climate Change and Ozone Layer Protection campaign; (ii) usage of technology innovation to enhance service delivery. The service delivery-enhancing role of such technologies will be used in helping people realise the power of STI. One good example is the Department of Home Affairs, which has deployed mobile offices that are linked to the central server through satellite technology. This enables citizens at remote sites to be issued with identity documents such as birth certificates without having to go to a formal Home Affairs office. The impact of this technology includes among others, savings in time and transport costs that would have been incurred by citizens when travelling to the nearest Home Affairs office; and (iii) the Department of Sports and Recreation offers a great potential for communicating STI to the people. The local science centre community for instance, has exhibits that communicate the science and mathematics of soccer. In collaboration with the Department of Sports and Recreation, attempts will be made to use popular sporting codes to communicate STI to the people.

(e) Science centres, natural history museums and interpretation centres

- *Science centres:* Of the various institutions involved in organising activities celebrating the NSW, science centres are the only institutions whose full-time responsibility is the promotion of STI to the people. According to the Ten-

Year Review study, science centres were the only institutions that are consistent in their involvement in the NSW. There are currently 30 science centres in South Africa, with each province having at least one science centre. Science centres will include the NSW in their annual plan of activities instead of the existing practice where their involvement in the NSW is treated as if they are doing outsourced contract work for the DST. A two-tier process will be followed to achieve this: (i) annually, the DST provides science centres with Programmatic Support grant funding. The Programmatic Support grant funding will be adjusted accordingly to cover science centres' NSW programme; and (ii) the Southern African Association for Science and Technology Centres (SAASTEC), which is an umbrella body for local science centres, will develop a national plan that will guide the activities of science centres during the NSW.

- *Natural history museums:* Exhibits in these museums cover various scientific topics, therefore provide additional readily available tool to communicate science to the people. South Africa currently has 14 natural history museums that are spread across 6 provinces. In the past editions of the NSW, no formal arrangements were put in place to facilitate the participation of the natural history museums in the NSW; hence, there was no visible participation of these institutions. The objectives of the NSW will be enhanced by using existing education, public and outreach programmes at the museums. The actual plan will be generated with the natural history museums; one option to could be to seek the assistance of the departments concerned to drive the process.
- *Interpretation centres:* Some of the interpretation centres hosts have scientific significance or relevance. Such centres will be identified and negotiations held with them establish the best ways in which they can advance the objectives of the NSW. Maropeng at the Cradle of Humankind World Heritage site, for instance, uses fun approaches to relate stories of the evolution of life and origins of humankind. Moreover, the palaeosciences has been identified as an area of geographic advantage in the NRDS, in which South Africa should aim at achieving international research excellence.

(f) Decision-makers or politicians

Steps will be taken to use the NSW to establish a foundation to expose decision-makers or politicians in the National Assembly and the National Council of Provinces to some developments in STI, particularly the work led by government. The route to be followed will entail: (i) inviting members of the Portfolio Committee on Science and Technology to NSW activities; (ii) between 2013 and 2017, a permanent science and technology subject area in the Parliamentary Library will be launched. Currently, the Parliamentary Library is arranged into 11 clusters or subject areas. There is no science and technology cluster or subject area; and (iii) setting up an exhibition in the library of the Parliamentary precinct during the NSW (if possible).

(g) Industry

Technology and innovation business seminars: Technology and innovation dictate the behaviour of industry as they seek to achieve their businesses objectives. This takes various forms, including, how technology and innovation enables businesses to improve the way they do business, as well as how they attempt to keep up with the needs of their clients by introducing new products to the market. In this regard, business seminars will be organised in collaboration with some graduate business schools where technology and innovation-based businesses will tackle relevant topics. Such seminars will also delve into global challenges brought about by the use of technology and innovation in businesses, including how affected businesses intend to be part of the solutions to such challenges. In this context, technology and innovation-based industry could, for example, discuss how they intend to contribute to green growth and green innovation.

(h) Media

Partnerships with the media will be sought. Different forms of media platforms will be used to target specific audiences. The NSW media activities will include, but not limited to the following:

- *Radio:* With an estimated 10 million radio sets in South Africa, and a number of listeners estimated to be far higher than this, radio remains a biggest source of information for both rural and urban population. Two ways will be followed regarding the use radio in the build up to and during the NSW: (i) based on the size of listenership and type of audience sought to be reached, radio stations that host talk shows will be approached to incorporate STI topics in their talk show programmes (during the NSW). This will offer the public and professionals an opportunity to share their views on STI matters. "The John Robbie Show" on Talk 702, a station with a listenership of about 538 000 people is one such example; and (ii) the public broadcaster has up to 11 radio stations that broadcast in various local languages. These stations have scheduled education and/or science and technology programmes that have been used successfully over the past three editions of the NSW (2009-2011). Media plans for the radio platform will be developed. This will also include the Government Communications and Information Systems (GCIS) radio services with a link-up to community radio stations. Scientists from academia and science councils will be deployed for interviews at these radio stations. Commercial radio stations such as Radio Metro, 5FM, Goodhope, HeartFM and Kaya FM will also form part of the media platforms to popularise NSW.
- *Television:* Partnerships will be sought with the public broadcaster the South African Broadcasting Corporation (SABC) to secure the incorporation of STI activities in their television flagship education programmes. Targeted programmes are: (i) youth education such as Teenagers on Mission (TOMZ); and (ii) public information and social

development. Further partnerships will also be sought with free-to-air television station etv.

- *Out-of-home (OOH) media:* This method of communication, which entails targeting people at public places, people in transit or waiting in commercial places, offers a window of opportunity to expand the reach of the NSW. For instance, Rank TV that takes the form of giant television screens located at major transport nodes nationally is estimated to reach an unduplicated 2.5 million daily audience and the big screen at the Johannesburg Park Station offers another opportunity. Appropriate formats of OOH will be identified for use in the NSW.
- *Print media articles:* Selected messages, including scientists' interviews and written opinion pieces will be published in: (i) newspapers and magazines; and (ii) stakeholders' in-house magazines and newsletters. Higher education institutions and organised labour newsletters are some of the examples that could also be used.
- *Science journalism capacity building:* The DST has initiated a Science Journalism training programme for journalists and media with SANEF, the University of Stellenbosch and Rhodes University. The initial training programme was held at the University of Stellenbosch and was over-subscribed. This training programme will also include journalists from community radio stations in the different provinces. A formal training programme on science journalism will be developed following reviews of the current initiative. Appropriate international partners will be secured to enhance the training. A potential partner already identified is the United Kingdom National Commission for UNESCO (UKNC), which encourages development of science communication in developing countries through among others, building the professional skills of science journalists and other communication specialists.
- *Social media* has become a common communication and publishing platform in the world, and South Africa has not been left behind. An effective way of exploiting opportunities offered by social media to promote awareness of and public engagement with SET will be

established. The plan will revolve around three most popular types of social media, viz. Facebook, Twitter and Mxit. These constitute untapped potential, in the light that in 2011, there were about 10 million people active Mxit users in the country, with about 1.1 million on Twitter and approximately 4.2 million on Facebook.

- *Performing arts:* A significant section (both young and old) of the population is unable to participate in the NSW because of time constraints. It is therefore useful to tap into people's leisure time to spread the STI message. Listening to radio or watching television could well be considered one common way of relaxing and spending some quality time. In this regard, performing arts in the form of popular television and radio serials (drama and soaps) have been identified as a vehicle to convey the NSW message to the masses. Existing popular television serials include Generations (SABC 1 channel) and Sewende Laan (SABC 2 channel), which are with a daily viewership of 4.9 million and 2 million people, respectively, to name a few. Arrangements will be made with the producers of selected popular television and radio serials to integrate STI activities in episodes broadcasted or aired in the build up to and during the NSW.

2.5 Taking advantage of the country's Indigenous Knowledge strength

Indigenous Knowledge (IK) is one of the scientific areas in which South Africa has knowledge advantage. If adequately explored, IK could help people to connect and appreciate science, technology and innovation (STI). This concept will be taken further by focusing on three areas in which the DST has interest: (a) exposing the public in general to the existing bio-prospecting research programme led by the CSIR. The programme is about searching and finding sustainable use of chemical and genetic components of biodiversity and indigenous knowledge; (b) Due to its astronomy geographic advantage, South Africa is involved in various efforts to make the country an international astronomy research destination, mainly through the development of astronomy research infrastructure in the Northern Cape. There are already some astronomy awareness

activities taking place at a small scale in the country, which will be strengthened through the NSW by intensifying and/or incorporating the indigenous knowledge perspective on astronomy; and (c) South Africa's hosting of the 17th Conference of the Parties (COP17) to the United Nations Framework Convention on Climate has created curiosity in many citizen's minds. Building on the momentum created, further discussions on the science of global climate change will include the science of some traditional practices (with link to climate change) that were used in the past and still used by some communities to manage the ecosystem.

2.6 Piloting the concept of "science and technology literacy of the workplace"

The working environment provided by science-based industries is a potential platform to connect the public to STI. South Africa's chemicals industry, which includes, fuel and plastics fabrication as well as pharmaceuticals dominates manufacturing in the country and is said to account for over half the jobs created by the manufacturing sector as a whole.

The implementation of the NSW during the period 2013-2017 will include testing the feasibility of using workplace activities as a base for communicating STI to the workers. The exact format of the exercise will be thrashed out with the stakeholders such as organised labour and employer organisations. This could involve workers sacrificing 30 minutes of their lunchtime on one of the days during the NSW to participate in a special session led by the technical team members in the business organisation. The intended outcome of this approach is to make workers aware of the science linked to their own work environment and the science-based skills required by their work environment.

2.7 Profiling Mathematics

Prompted by the role of mathematics in the development of science and technology, the NSW will visibly profile mathematics. Such a campaign will be structured with the intention to:

- highlight some scientific and technological breakthroughs that were achieved by employing mathematical modelling techniques. Such examples exists in life sciences, engineering and physics, among other, and
- enhance mathematics education by shaping the views of learners, parents and educators on the significance of mathematics in studying science and pursuing SET careers, as well as showing that learning mathematics can be fun and enjoyable, to everyone.

The South African Mathematics Foundation (SAMF), which brings together the Association for Mathematics Education of South Africa and South African Mathematical Society, will serve as the custodian of profiling mathematics within the NSW.

2.8 Branding and publicity of the NSW

Implementation of the NSW will be accompanied by a strong publicity campaign aimed at: (a) creating awareness about the NSW. The intention is to get the public to become aware of the NSW; and (b) building the NSW brand image. In order to achieve this, the DST's Science Communication Subprogramme will develop an appropriate communication strategy that will be revised or updated when deemed suitable over the five-year period. The strategy will among others, provide guidance on the manner in which the national launch events of the NSW will be handled.

2.9 Promoting cooperative government

Over the past years, the DST was consistent in ensuring that the NSW was implemented in a manner that upholds the constitutional principles on cooperative government and intergovernmental relations. Progress made to date in this regard includes incorporation of the NSW in some of the provinces' calendar of events and resource allocation plans. Building further on the foundation already in place, provinces and the Cabinet will be informed annually about the forth-coming edition of the NSW. Relations with provinces will be cemented further by continuing with the practice where provinces host the NSW

national launch events in rotation and provincial launches will remain the discretion of the respective provinces.

2.10 Production and distribution of subject content material

Posters, comic strips, DVDs and brochures are among the available options of subject content materials that will be produced and distributed as part of the NSW celebrations. The scientific content and structure of the material will be informed by the theme of the NSW and the target audience. Attention will be given to the distribution strategy of each type of the material.

2.11 Public libraries

National libraries offer another untapped approach to reach out to the public. South Africa has a network of about 1 200 public libraries. While a full programme on the participation of libraries in science and technology awareness will be developed in collaboration with the public libraries, the approach to be considered will include: (a) setting up of exhibitions at the foyers of the libraries; and (b) digital information screens projecting relevant science and technology images.

2.12 Establishing partnerships with relevant non-governmental organisations

Non-governmental organisations whose work can enhance the objectives of the NSW will be brought on board to advance the objectives of the NSW. Examples of such organisations are AfricaBio (which seeks to promote the safe, ethical and responsible research, development and application of biotechnology and its products) and the Shuttleworth Foundation.

2.13 Mobile outreach services

A national database of organizations and individuals with appropriate mobile facilities will be established, including those organizations and individuals who have been part of

previous editions of the NSW. Such organizations will be deployed to conduct activities at strategic points: (i) under-serviced areas, particularly rural areas and townships; and (ii) mass visitation points such as shopping malls and taxi ranks. Among activities that the mobile services will take to the targeted areas are exhibits and science performances or demonstrations.

2.14 Incorporating international cooperation

The DST has partnership projects with other countries because of bilateral agreements between countries or resolutions of regional bodies' programmes.

Besides involvement in science, technology and innovation regional activities, the DST has bilateral cooperation agreements with several countries. There have been instances were the DST and some of such countries agreed on joint celebration to among others, mark some progress in their joint projects, for example, 2012 has been declared South Africa - German Year of Science. Where there are such joint celebrations planned, the DST's International Cooperation and Resources Programme, which drives the Department's international relations agenda, will consider incorporating some activities into the NSW programme. In the event that the planned joint activity is a weeklong or less, the feasibility of conducting it within the NSW will be explored.

3 MODEL FOR COORDINATING STAKEHOLDERS' INVOLVEMENT

A three-tier coordination model will be followed to facilitate the involvement of various stakeholders or participants described by this project implementation strategy:

(a) The traditional approach, which has been used since the inception of the NSW, will be retained. Annually, an open call for proposals will be announced inviting individuals and organisations to submit their plans on the NSW activities they intend organising. Guidelines for compiling and submitting the proposals will indicate which individuals and organisations are should respond to the call.

(b) In order to intensify the involvement of all the sections of the DST and the Department's strategic partners, affected directorates (of the DST) will take full

responsibility to facilitate the involvement of their external project partners. As alluded to earlier for instance, the High End Skills Unit will facilitate the involvement of the Centres of Excellence based at different higher education institutions.

(c) The DST and/or SAASTA will approach and negotiate with some of the stakeholders in order for certain participation approaches mentioned in this plan to take effect. One such example is the use of performing arts, which requires negotiations with the producers of the drama or soap.

The Science and Youth Unit of the DST and SAASTA will ensure that the activities that are part of the NSW celebrations are aligned to the objectives, as well as the theme of the initiative.

4 PROJECT INSTITUTIONAL ARRANGEMENT

Implementation of this plan will be a collective involvement of various stakeholders and/or participants. This section (of the implementation strategy) describes the responsibilities of organisations, which based on the model for coordinating stakeholders' involvement, will facilitate the involvement of all stakeholders and/or participants, as well as create an enabling environment for their involvement.

4.1 Department of Science and Technology (DST)

The DST will:

- develop and implement a comprehensive communication strategy for the NSW;
- facilitate inter-departmental and inter-governmental relations to advance the objectives of the NSW;
- where necessary, approach certain stakeholders or participants for their involvement in the NSW;

- provide leadership on the evaluation of the NSW, including the description of performance indicators;
- provide the core funding for the NSW;
- organise activities for decision-makers; and
- in instances where there are partnership initiatives in which the DST is involved (for example, the Centres of Excellence based at some of the higher education institutions), the DST will facilitate the involvement of such initiatives in the NSW.

4.2 South African Agency for Science and Technology Advancement (SAASTA)

SAASTA, a business unit of the National Research Foundation (NRF) in its capacity as a national coordinator and implementing agency of the NSW will have the following responsibilities:

- collaborate with relevant stakeholders in the setting up of systems required to deliver the NSW Implementation Strategy (2013-2017);
- disburse funds allocated by the DST for the implementation of the NSW in various appropriate forms that are congruent to the NSW implementation strategy, for example, honoraria and/or grant funding to qualifying individuals and institutions;
- support the DST in other activities linked to the NSW, when such need arises;
- design, in consultation with the DST appropriate instruments to monitor NSW activities;
- ensure that all the National Research Facilities in the NRF stable incorporate NSW celebrations in their annual plans;
- annually establish a team drawing its members from local science communicators to represent South Africa in inter-governmental or cross-border science awareness initiatives to which the DST is invited to participate; and
- provide regular update to the DST on the progress regarding preparations for each edition of the NSW to be implemented in terms of this plan.

5 FUNDING REQUIREMENTS

DST's funding will continue to be the source of the core funding for the NSW. However, any other interested parties are encouraged to enhance the objectives of the NSW by providing additional resources (financial or in-kind support).

SAASTA will make available relevant information on how stakeholders and/or participants can access the allocated.

6 RISK MANAGEMENT

Annexure A depicts a risk management plan regarding the implementation of the NSW implementation strategy.

7 EVALUATION

The evaluation of the NSW will take place at three levels:

(a) process evaluation: It will assess aspects related to the various implementation approaches identified by this plan, the reach of the NSW and the quality of the NSW activities.

(b) impact evaluation: The focus will be on the effect of the NSW on the people or stakeholders, in the context of the predetermined objectives. Media monitoring will also be used to gauge the performance of the media campaign.

(c) outcome evaluation: The NSW is part of the broader STI awareness and engagement programme of the DST, which has clearly defined goals. The outcome evaluation will assess the contribution of the NSW to the overall goals of the DST's STI awareness and engagement programme.

The data necessary for the three levels of evaluation will be captured through the use of an electronic tracking system. Such data will be analysed annually and/or in line with the measuring approach indicated depicted by Annexure B (project logic model).

Annexure B presents project logic model will form the basis of the NSW evaluation planning.

ANNEXURE A: NSW RISK MANAGEMENT PLAN

Risk	Response Strategy	Response Action	Responsibility	Interval or Milestone Check
Insufficient human resource capacity within the NRF/SAASTA to set up a national system to implement the NSW implementation strategy	Mitigation	The DST will provide support where necessary	DST	Annually
Monitoring the NSW activities	Mitigation	Appropriate instruments will be developed and where necessary, the some components of the process will be outsourced	DST and NRF/SAASTA	Annually
Introduction of previously untried approaches in South Africa	Mitigation	Securing buy-in of key stakeholders and role players	DST	Annually

(#212557 Hummingbird)
(#389855 Alfresco)

Project Objectives	Key Activities	Outputs	Impact	Outcomes	Measuring Approach
Serve as a vehicle for showcasing local innovations in science and technology, and the leadership role of the DST and other government departments in enabling research, development and innovation Popularise science to the broader South African society	• Activities driven by higher education institutions, government departments with STAs, science councils • Conduct science communication through electronic & print media • Communicating STI through performing arts • Deploy mobile outreach services to strategic points • Conduct science communication through social network • science centre-based awareness & engagement programmes	• 5 million people exposed to local scientific & technological innovations, as well as DST's work through media and related activities in 2013, followed by annual growth of 15% • 1 million participated in the NSW activities exposing them to local scientific & technological innovations, as well as DST's work in 2013, followed by annual growth of 10%	People have insight of local scientific & technological innovations and the work of the DST	Contribution of the NSW to a society that understand and values STI, as well as appreciating their critical roles in ensuring national prosperity and a sustainable environment	• Annual generation of feeder participation data (in the NSW) that will be captured and processed electronically. The data will feed into: (a) two surveys conducted within a 5-year period (preferably in 2014 & 2016); and (b) impact evaluation study in 2018/19 financial year • Annually establishing the viewership, listenership of electronic media and readership of print media used in the NSW
Familiarise targeted communities with the science linked to areas in which South Africa has knowledge and/or geographic advantage so as to contribute in making them informed and critically engaged citizens	Additional to the above: • Pilot workplace science literacy concept • Use IKS to promote STI • natural museums-based activities • interpretation centres-based programmes	Same as above	People have insight of scientific links to their environment		

Project Objectives	Key Activities	Outputs	Impact	Outcomes	Measuring Approach
Make STEMI appealing to leanrers, such that they consider SET as preferable career options	• Develop & distribute to schools safe & fun experiments /games • Conduct role modelling campaign at schools • Targeted distribution of SET career information • Profile mathematics	All 500 Dinaledi schools reached in 2013 & at least 40% of the non-Dinaledi schools reached by 2017	• Positive change in preferences for mathematics & physical science subjects when learners enter Grade 10 • Choice of higher education SET studies by school leavers	Contribution of NSW to the development SET human capital pipeline	• Annual tracking of a representative sample of learners & students who participated in NSW • Recording schools participating in NSW