INSTITUTIONAL REVIEW

of the

NATIONAL SCIENCE FOUNDATION

(2009 - 2012)

A report prepared for the

NATIONAL SCIENCE AND TECHNOLOGY COMMISSION

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Abbreviations

CKDU	Chronic Kidney Disease of Unknown aetiology.
HARTI	Hector Kobbekaduwa Agrarian Research & Training Institute
IBSL	Institute of Biology of Sri Lanka
IESL	Institution of Engineers of Sri Lanka
IPSL	Institute of Physics of Sri Lanka
ISO	International Standards Organization
JNSF	Journal of the National Science Foundation
M&E	Monitoring & Evaluation
MIS	Management Information System
NARESA	Natural Resources, Energy & Science Authority
NIE	National Institute of Education
NRC	National Research Council
NSC	National Science Council
QA	Quality Assurance
RD&I	Research, Development & Innovation
SCI	Science Citation Index
SLAAS	Sri Lanka Association for Advancement of Science
SLBC	Sri Lanka Broadcasting Corporation
SLJSS	Sri Lanka Journal of Social Sciences
SLMA	Sri Lanka Medical Association
SLRC	Sri Lanka Rupavahini Corporation
SMC	Senior Management Committee
SOCM	Scientific Operations Committee
STI	Science, Technology, Innovation
SWOT	Strengths, Weaknesses, Opportunities, Threats

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Acknowledgements

The Review Panel appreciates the confidence placed in them by NASTEC and acknowledges the guidance provided through the Review Manual. The support provided by Prof. D. A. Tantirigoda (Chairman) and Dr. Muditha Liyanagedara (Director) is specially appreciated.

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Prof. W. L. Sumathipala (Chairman, NSF), Mrs. Anusha Amarasinghe (Director, NSF) and all the staff of the NSF co-operated with the panel completely, without reservation. We acknowledge their co-operation gratefully.

Prof Sirimali Fernando, former Chairperson, and some members of the former Board of Management graciously agreed to meet us and exchange views and provided us insights which were invaluable in arriving at our judgment.

A wide selection of stakeholders of the NSF from the scientific and academic community, the Ministry of Education and a few from industry and general public participated in a lively stakeholders meeting and gave us their frank feedback which helped us to view the performance of the NSF in perspective. We are thankful to them.

Executive Summary

The Science and Technology Development Act No. 11 of 1994 mandates the National Science and Technology Commission (NASTEC) to review the progress of Science and Technology Institutions in respect of goals and objectives identified for each Institution.

The National Science Foundation (NSF) is a state funded statutory institution which operates within the purview of the Ministry Technology & Research (previously Science and Technology). It is mandated to: initiate, facilitate and support basic and applied scientific research by universities science and technology institutions and scientists with a view to; strengthen scientific research potential including research in social science and science education programs; develop natural resources in Sri Lanka; promote the welfare of the people in Sri Lanka; train research personnel in science and technology; foster interchange of scientific information among scientists in Sri Lanka and abroad; award scholarships and fellowships for scientific study or scientific work at recognized science and technology institutions; maintain a current register of scientific personnel and in other ways to provide a central clearing house for the collection interpretation and analysis of data on the availability of, and the current and projected need for, scientific and technical researchers in Sri Lanka, and provide a source of information for policy formulation on scientific technology and other fields, and popularize science amongst the people by funding and executing programs for the purpose.

It was established in 1998 and is the successor to National Resources Energy and Science Authority (NARESA) established in 1981 as successor to the National Science Council (NSC) established in 1968.

An independent review panel consisting of four members was appointed by NASTEC in consultation with the NSF to report on the progress of NSF from 2009 to 2012. The review was conducted as per guidelines stipulated in the review manual published by NASTEC. The review was conducted during August 2013 to November 2013. The main objective of the review was to assess how effectively the NSF has acquired and utilized resources to generate and implement programs consistent with their mandate and to provide outputs which are relevant to its stakeholders and to national development goals.

Though the review focused mainly on the specified time period (2009 – 2012) it viewed the evolution of the NSF over time, since its inception and its future direction as envisaged in the Corporate Plan (2013 – 2017). The review commenced with careful perusal of the self-assessment report provided by the institution. On the first day of review this was complemented by a comprehensive presentation by the Director NSF which gave an insight in to future direction of the NSF under the newly appointed Board of Management.

Review continued with several subsequent visits to the institution where all the divisions were visited and separate discussions were conducted between the panel and staff of each division. Subsequently the panel had a half day interaction with a wide range of stakeholders of the NSF where a frank discussion ensued. After a meeting with representatives of the trade unions the panel also met the Chairman and members of Board of Management (from 2009 to 2012), which gave the panel an insight into the rationale of the policies and programs implemented and some reasons for their success/failure.

The professional opinion of the panel was arrived at in accordance with the guidelines given in the review manual developed by NASTEC. It was based on a detailed assessment of the management practices and a critical evaluation of its outputs in relation the available physical and human resources. The panel perused a large number of relevant documents to complement and confirm the information obtained by discussion and observation. The panel made due allowance for the strengths and constraints of the political and economic context within which the institution functioned.

It is the considered opinion of the panel by consensus that within the above mentioned context the NSF has fulfilled the expectations based on its given mandate. The panel feels that there has been a progressive improvement in performance over this period It has clearly gained the confidence of a large majority of its stakeholders in the scientific and academic community and the education system.

In spite of a relatively modest remuneration and incentive package in comparison with comparable scientific institutions the staff have been more than adequately productive in their respective spheres of activity.

There are a few lacunae in performance especially in the areas of income generation, and technology transfer. The few areas in which there is room for improvement are dealt with in the detailed comments and recommendations. Few management practices that need improvement too are addressed.

The output of the NSF has direct relevance to national development goals and is consistent with the objectives of the national science and technology policy. The panel is of the opinion that greater allocation of resources and their timely disbursement would enhance its productivity and contribution to national development goals.

1.0 Introduction: Overview of the National Science Foundation

History

The National Science Foundation (NSF) was incorporated in 1998 under the Science and Technology Development Act No.11 of 1994. NSF is a State funded Statutory Institute and is the successor of the National Science Council (NSC) – 1968 and Natural Resources, Energy and Science Authority (NARESA) – 1981.

Mandate of the NSF

NSF is mandated to serve and strengthen the Science and Technology sectors in Sri Lanka, performs its tasks in accordance with the functions set out in the Act and its activities conform to the National Science & Technology Policy. Accordingly, the NSF facilitates research, development and innovation to create a knowledge economy. It also facilitates capacity building, infrastructure development, technology transfer, knowledge creation, sharing of knowledge in all fields of science & technology to improve the quality of life of the people and also popularization of science among school children, teachers and parents envisaging a knowledge society.

Its functions, as specified in the Act, are as follows:

a) To initiate, facilitate and support basic and applied scientific research by universities, science and technology institutions and scientists, with a view to:
   I. strengthening scientific research potential, including research in the social science, and science education programs;
   II. developing the natural resources of Sri Lanka;
   III. promoting the welfare of the people of Sri Lanka;
   IV. training research personnel in science and technology.

b) To foster the interchange of scientific information among scientists in Sri Lanka and abroad.

c) To award scholarships and fellowships for scientific study or scientific work at recognized science and technology institutions.

d) To maintain a current register of scientific and technical personnel, and in other ways to provide a central clearing house for the collection, interpretation and analysis of data, on the availability of, and the current projected need for, scientific and technical resources in Sri Lanka, and to provide a source of information for policy formulation on science, technology and other fields, and

e) To popularize science amongst the people by funding and executing programs for the purpose.

Vision of the NSF

"To be the nation's premier driving force in promoting Science, Technology & Innovation for economic and social prosperity of Sri Lanka."

Mission of the NSF

Initiate facilitate and support research, development, innovation and technology transfer through funding, knowledge creation, capacity building, partnerships, information dissemination and popularizing science to create a knowledge driven society and economy, efficiently and effectively, and contribute to improve the quality of life and standard of living of our people whilst nurturing a competent staff and ensuring transparency, accountability, fairness, equity and principles of sustainability.

The Corporate Goals

Six goals have been identified in the Corporate Plan of the NSF 2013-2017 based on its mandate.

- *Goal 1*: To be the premier organization to promote RD&I, S&T capacity building and be a partner in promoting natural resources conservation and utilization for sustainable development of the country.
- *Goal 2*: To be the leader in facilitation of technology development and transfer and to emerge as the eminent catalyst for RD&I commercialization.
- *Goal 3*: To be the focal point to collect, collate, analyze, interpret, store, disseminate and provide access to STI information.
- *Goal 4*: To be the leader in popularization of STI amongst general public and partner in promoting science education.
- *Goal 5*: To be the key gateway for the international liaison of STI community.
- *Goal 6*: To be the leading RD&I funding organization with improved governance, management and competent scientific, administrative, technical and support staff.

Governing Ministry

NSF functions under the purview of Ministry of Technology & Research. During the period under review, it was the Ministry of Science & Technology.

Sources of Funding

NSF, being a Government statutory board receives the annual capital and recurrent grants from the Government Treasury. A very small portion of funds are generated internally mainly from sale of publications. A small percentage of funds for specific projects have been received from International Organizations (IDRC, UNESCO).

Organizational Structure

NSF is governed by the Chairman and the Board of Management (BoM). The BoM decides on the policies and the Director as the chief executive officer coordinates the activities. NSF has total of 122 employees as of 31st July 2013 out of which 38 are science and technology personnel, 15 administrative staff, 8 are technical staff and 61 supporting staff.

The organization has five Scientific Divisions: Research Division, Technology Division, International Liaison Division, Science & Technology Policy Research Division (STPRD), Information and Knowledge Division (IKD) and four supporting Divisions: Administration, Accounts, Internal Audit and Information Technology.

2.0 Procedure Adopted for the Review

An independent panel comprising four members that was appointed by the NASTEC in consultation with the NSF carried out the review. The panel members were:

Prof. Narada Warnasuriya (Chairman) – Emeritus Professor and former Vice-Chancellor, University of Sri Jayewardenepura

Dr. N. P. Wijayananda – former Chairman, Geological Survey and Mines Bureau

Prof. J. K. D. S. Jayanetti – Professor and former Head, Department of Physics, University of Colombo

Prof. Udith Jayasinghe-Mudalige – Professor (Chair), Department of Agribusiness Management, Wayamba University of Sri Lanka, QA Consultant, Ministry of Higher Education

Panel was formally informed about the review procedure at a meeting held on the 19th of July at NASTEC by Prof. D. A. Tantirigoda, Chairman/NASTEC. The review was based on the guidelines given in the Review Manual prepared by NASTEC.

The review panel made several visits to the NSF for the acquisition of information with regard functioning of the NSF. Given below is the description of visits made by the review panel:

- 1st August 2013: 1st visit to the NSF– Chairman of NASTEC and the Review Panel meeting with the Chairman, NSF, the Director of NSF and Senior Officers. The presentation by the Director/NSF, Meeting with the Technology Division(TD), Observation of facilities of the division;

- 8th August 2013: 2nd visit to the NSF– Meeting with the Research Division, The Science Popularization Division, and Science & Technology Policy Research Division, Observation of the facilities of the divisions;

- 22nd August 2013: 3rd visit to the NSF– Meeting with the Administrative Division, Accounts Division, Internal Audit Division and the Science Library & Resources Center, Observation of facilities of the divisions;

- 10th October 2013 (Morning): Meeting with the stake holders of the NSF, at Hector Kobbekaduwa Agrarian Research & Training Institute (HARTI). Meeting was well attended by a gamut of stake holders representing universities, research institutes, private organizations, school sector and business enterprises from all levels in terms of seniority;

- 10th October 2013 (Afternoon)**:** 4th visit to the NSF– Meeting with the Printing Unit and the IT Unit;

- 10th October 2013 (Afternoon): Discussion with Trade Union Representatives;

- 30th October 2013**:** Meeting with the members of the Board of Management of NSF during the period 2009-2011. Board members present were, Chairman Prof. Sirimalee Fernando, Dr. M. C. N. Jayasuriya (Director, NSF till March 2009), Eng. Sarath Abeywardena (Director, NSF from April 2009 to 2011), and Prof. Ananda Jayewardene (Vice-Chancellor, University of Moratuwa).

The panel perused a large number of documents (Annexure 1) made available by the NSF and few more provided on request. As specified by the review guidelines, information gathered during visits and meetings along with information gathered by perusal of all relevant documents including the self evaluation report prepared by the NSF and the corporate plans were used by the review panel to assess the outputs of the institution and its management processes and to come to a judgment about its performance Where ever possible the information was triangulated to establish its veracity. On the last day there was a debriefing with the Director NSF in order to clarify any doubts.

Ms. Asha Pitadeniya, Scientific Program Manager of NASTEC made invaluable assistance to the review panel by coordinating the visits to NSF, arranging meetings and making relevant documents available during the entire course of the review process.

The review report was prepared in a participatory manner by all four members of the panel. Although different sections were written by different members all collectively viewed the final document and there was complete consensus on all the opinions and conclusions in the report. The panel takes collective responsibility for the report.

3.0 Management Assessment

Commentary on Management Assessment

The Review Manual formulated by the NASTEC indicates nine management aspects and each aspect is further supported by a number of salient statements which are applicable to S&T institutions, in general, and in this case almost all are applicable to the NSF. Below we summarize the key points identified by the Review Team.

3.1. Assessment of Institutional Response to External and Internal Environment in Planning Organizational Strategies

The review panel found that the NSF has formulated comprehensive corporate plans covering the periods 2009-2013 and 2013 – 2017, both of which clearly elaborate the Vision, Mission, Specific Objectives and Strategic/Action Plans. Further, it is observed that these strategies are sufficiently aligned with the government policies and development goals and consistent with its organizational mandate. The top management, the Board of Governors and the senior staff have been directly involved with formulation of such plans/policies, and the two plans confirm continuity and have been updated annually, as appropriate, i.e. on a rolling basis.

However the planning process had adopted a largely top to bottom approach and consultation with the lower grades of staff had been minimal. As far as we could ascertain there had not been a formal consultation with a wide group of stakeholders, the stakeholder input had come mainly from those actively involved in the various committees and panels.

In spite of a fairly down to earth SWOT analysis not all the threats identified have been adequately addressed in the strategic planning. Most importantly the near total dependence on state funding and the erratic nature of its disbursement by the Treasury has been recognized but no attempt has been made to plan innovative approaches to generate funds or adequately mobilize all potentially available sources of funding. There is a tacit acceptance that being a 'service organization' they need to depend on state funds. There is some evidence that policies are reviewed intermittently and the plan updated as needed based on both internal and external factors

3.2 Planning S&T Programs and Setting Priorities

The review panel observes that both National Development Goals and stakeholder interests are taken into account adequately in S&T program planning. This is partly due to the fact that NSF is almost exclusively dependent on government funding and alignment with government policy objectives becomes a necessity. However, there is room for improvement in prioritizing of programs based on national needs. For example programs to address long standing problems in the country such as CKDU, or pollution due to industrial waste have only been planned lately, only after problems had reached crisis point.

The new initiative of thematic multi disciplinary research does address the issue of prioritizing to some degree. There has been tendency overtime, especially in the research directed towards a post graduate degree to address conventional problems to a large extent. Therefore, with regard to "setting priorities", care must be given to revise these programs on a regular basis to make them more relevant to national needs.

The need for an identified list of national research priorities to guide potential researchers was highlighted by some stakeholders. Whether this falls within the purview of the NSF or more appropriately the NRC has to be decided. Stakeholder interests are addressed adequately in program planning, as a wide but carefully selected cross section from the scientific community are well represented in the advisory panels and review committees. However representation of the lay public who are also stakeholders is limited and the corporate sector too is minimally involved.

The programs are planned and approved through correct procedures and availability of funds from the state or in a few instances from other sources (e.g. IDRC, UNESCO) have been taken into reckoning.

Majority of the stakeholders are satisfied with the efficiency of procedures for approving programs and projects, but some feel that they could be more stream lined. The panel notes favorably recent initiatives to standardize and shorten the review process. Minimal participation of the corporate sector/entrepreneurs in the planning process has resulted in inadequate consideration of the commercialization potential of program/project outcomes

The Divisions responsible for S&T research are seen working towards achieving the intended targets, within their human and physical resource capacities. Greater coordination of these efforts at the senior management level may improve the efficiency and effectiveness of these programs. The review panel notes with approval the revised organizational structure which delegates the coordination of the scientific and research programs to the Additional Director.

3.3 Planning S&T / R&D Projects

It was observed that the NSF follows a formal process for preparation, review and approval of projects, thus, there exists minimum opportunity for bias. The process is known to the stakeholders, is transparent, and published in its web site. Multidisciplinary research projects are encouraged, though only few such projects have been implemented during the past few years due to other constraints including resistance from individual researchers. Recent initiative to launch the National Thematic Research Program (NTRP) is viewed favorably. It promotes multidisciplinary research linking several research institutions and researchers together.

NSF has consistently supported basic research and continues to do so. The scientific community in the universities and research institutions have strongly acclaimed the NSF role in capacity building.NSF grants in the early stage of a scientist`s career fund mostly basic research projects often directed towards obtaining a post graduate degree. At the stakeholders meeting several eminent and productive senior scientists gratefully acknowledged NSF`s role in their own career and in adding to the national pool of researchers .The review panel views nationally relevant basic research as a prerequisite for applied research and strongly endorses the recent policy decision that at least 40% of research funding disbursed by the NSF should be directed to basic research.

Several Research Advisory Committees are established to oversee planning, approving, implementation, monitoring and evaluation of research and development activities, and they are functioning satisfactorily. Although foreign collaborations are encouraged only a few projects have managed to achieve this and even in these projects the foreign contribution has not been utilized to the best potential.

One of the weaknesses identified is that the NSF does not make adequate efforts to involve the private sector in research activities. Although policy statements encourage it there is a failure to adopt appropriate innovative strategies harness private capital. However, in the recent past there have been some initiatives to have collaborative programs to support entrepreneurship, innovative research and development .Commercial potential of completed applied research projects have not been fully realized due to deficiencies at the level of project approval, and in effective monitoring and evaluation of final product on completion.

The technology transfer rate at present is modest at best, and it appears that with appropriate policy and procedures it can be strengthened substantially. Environmental concerns are adequately addressed in planning and in procedures for project approval. Clearance from the relevant regulatory agencies is mandatory for projects where such concerns are relevant.

3.4 Project Management and Maintenance of Quality

The effectiveness of administrative procedures for resource allocation at different levels of the NSF was seen to be quite satisfactory. Given budgetary constraints, the NSF has taken steps to maintain its stock of equipment and other infrastructure and utilize them for effective project administration.

Although individual staff/divisions adopt various mechanisms to assure and up keep the quality of their work, there is no formal quality assurance system in place at present. We note favorably that a time bound process for obtaining ISO 9001:2008 certification has commenced and all staff have been made aware of the concept of quality assurance.

The institutional procedures for procurement and logistics seem satisfactory. There is a pool of vehicles and drivers for transport which barely suffices for the essential functions. There is formal monitoring and review of all projects using a structured format and researchers are adequately supported in this respect by NSF staff. Although there is no field staff in the NSF, in the past field supervision of projects was done as required. The increase in number of projects with transport facilities remaining the same has made this practice a rarity at present.

The inadequacy of office space for each division results in the work space for individual staff being rather cramped and ergonomically sub optimal. This also compromises privacy and confidentiality.

The scientific/research staff have access to computers and necessary software and internet to work on their day-to-day functions. It would be desirable for these facilities to be equally extended to other grades of staff based on need. NSF administration has taken adequate measures for its staff, as a whole and the scientists and researchers who utilize its services to have free and unfettered access to scientific information, journals, databases, library facilities and internet.

Research projects are rarely completed within the planned time frame due mainly to factors beyond the control of the NSF such as delays in disbursement of funds by the Treasury and logistic constraints in the host institution. Occasionally lack of specialized staff in the NSF and undue delays by external reviewers prevents completion of project work on stipulated time.

3.5 Human Resource Management

NSF possesses a satisfactory staff selection and recruitment procedure which is transparent and equitable. The recruitment is done primarily on merit and there is very little political interference in the process. The staff in general and the scientific staff in particular, work enthusiastically in spite of a relatively modest remuneration package. They seem to derive significant professional satisfaction from their work. There is a good working environment within the institution and the relations between all categories of staff seem to be cordial, the limited resources being shared relatively equitably.

Though personal files are available for all staff there is no database which files and updates all relevant information about staff in an easily accessible manner while safe guarding their confidentiality .The IT capacity needed for this purpose is available and this should be considered an essential pre requisite for effective human resource management

The institution takes into account of the needs of each division in its attempt to recruit staff for its programs and projects, but has not been completely successful in this respect due to various constraints including the need for strictly adhering to DMS guidelines re qualifications etc . Some lateral thinking and discussion with the relevant authorities on how to overcome these constraints in filling essential cadre vacancies seems to be an urgent need. The overall remuneration package according to a majority of staff is low in comparison with equivalent scientific institutions. The medical cover provided is grossly inadequate. There are no financial incentives as the institution does not generate any funds on their own.

It is surprising that in spite of the above, compared to other similar institutions, there is low staff turnover, absenteeism and work interruptions within the NSF. There are only 22 vacancies in a total cadre of 144.The staff needs to be commended for their dedication in this context.

Although the staff have had a variety of training opportunities both local and foreign, they were not planned, based on a training need analysis .The training provided, largely locally, has been opportunity based rather than need based. There is a need to carry out performance appraisals regularly to understand the training needs. It would motivate the staff and increase their efficiency.

There is also a lack of opportunity for research staff to pursue higher degrees towards M.Phil or PhD. There is little incentive to do so as obtaining such qualifications count very little for promotions or pay.

3.6 Management of Organizational Assets

Infrastructure and Services:

The existing buildings, fields and roads within the premises are satisfactorily maintained. Reception area is well planned and gives a good first impression about the working environment. However space limitation is a constraint in carrying out is mandated activities The vehicles and equipment appear to be properly managed and maintained. Most of the equipment used in the office are well serviced the staff ensure that they are maintained in good condition. IT unit supports the staff in the best way possible and the facilities are mutually shared in many Divisions.

Funds: NSF has to depend on public funds for all its activities, including capital and recurrent expenditures for projects, programs and internal administration. There is a failure to identify potential sources of private funding or means to generate its own income. Even cost recovery is not considered to be feasible in respect of its publications. This aspect as indicated earlier is not sufficiently addressed in its strategic/activity plan.

The procedure used to allocate financial resources obtained from the government is based on annual plans, but every division does not get its targeted/proposed amount to carry out its intended activities. The limitation of activities is attributed to insufficient staff and limited treasury allocation and disbursement. It would therefore be desirable to actively explore alternate funding opportunities, especially in the areas of research, development, and technology transfer.

Utilization of the funds made available is done in an efficient manner addressing program and project needs. After making allowance for the erratic disbursement patterns of the treasury almost full use is made of the allocated funds

3.7 Coordinating and Integrating the Internal Functions/Units/Activities

The NSF has a clear organizational structure which indicates the paths for communication and reporting. The Board of Management (BOM) is the governing authority. It decides on policy and provides advice and support to the administration of the NSF. It meets once a month. The Chairman of BOM and the Director of NSF work mutually for benefit of the institution.

The Director is the CEO and chairs the Senior Management Committee (SMC) .The Heads of Divisions (HODs) coordinate the activities pertaining to respective divisions. The Additional Director has been delegated the task of coordinating and monitoring the scientific and technical divisions. She is to chair the Scientific Operations Committee (SOCM). This is a recent development. Three units, viz. Science Popularization Centre, NSLRC and the printing press have been combined to form a new division, the Information & Knowledge Division (IKD.)

The periodic administrative restructuring as mentioned above reflects the existence of an internal mechanism for monitoring and evaluation and the ability to respond to current needs. In spite of the general cordiality among staff of all grades and between staff of different divisions the national importance of the work that the NSF is involved in has not percolated to some support staff as evidenced by our discussions with the trade unions. This suggests the existence of a communication gap. Discussions with all staff at least intermittently are necessary to maintain optimal awareness and to provide a platform to express their views. We note favorably that such an initiative has been launched recently.

IT unit provides commendable Internet and E-mail services to all divisions. There is an effective internal communication and coordination mechanism and each staff member can be accessed though inter-com and from outside through the reception. This facilitates inter-divisional work. Each Division is assigned with clear cut specific mandate/functions, so evaluation of success or failure is easy and direct.

However, there is no formal mechanism to obtain feedback within the institution. This is specially felt as a need by lower grades of support staff. The lack of co-ordination between scientific staff and support staff, which happens occasionally, can be minimized by an internal quality assurance system which facilitates shared work towards a common goal.

3.8 Partnerships in Managing Information Dissemination

The NSF has made wide ranging efforts using its sophisticated IT capabilities maximally to disseminate information to the relevant stakeholders including universities, research institutions, industries, schools and general public. It also provides reliable and accurate data on scientific activities to policymakers in state and corporate sectors and international organizations. NSLRC's efforts in being the gateway to both local and global scientific information are truly commendable. It has partnered with many universities and research institutions in this endeavor.

This has been the strong point of the NSF over the years. However, the thrust of these activities is largely confined to the scientific community and school children. The impact on the corporate sector, industry and general public has been relatively small. A greater impact in these underserved areas is needed.

The NSF has partnered with many organizations in this effort but strangely it has no formal partnership with the SLAAS in this particular activity. The SLAAS has a long and successful track record in the field of popularization of science. A formal linkage with the SLAAS is likely to be mutually beneficial. The proposed National Science Centre is a praiseworthy endeavor in which such linkages may prove useful.

Similarly, linkages with the corporate sector may facilitate dissemination of information pertaining to technology transfer and commercialization of research products. Although institutional procedures for technology transfer are in situ, the actual achievement in this respect is modest.

At present, feedback from stakeholders is taken on an ad hoc basis and that too from stake holders who are closely involved in NSF activities. Regular and systematic feedback from a wide random sample of stakeholders is likely to be beneficial in program planning.

The NSF website is functioning quite satisfactorily and is updated regularly about current programs and projects. However, STMIS database is inadequately updated. This needs to be rectified as soon as possible as reliable, up to date and accurate data about scientific personnel is a pre requisite for effective S&T policy and program planning.

3.9 Monitoring, Evaluation and Reporting Procedures

NSF adopts fairly satisfactory monitoring and evaluation mechanism for its divisions and its programs and projects. These evaluation reports are submitted to the Board of Management through respective Heads of Departments. The internal audit officer conducts audits on all activities in accordance with an audit plan and reports directly to the Chairman of the BOM. She also liaises with the external audit process.

In the past divisions have used different formats for the purpose of reporting, and overtime, these have been streamlined into a common format. However, this mechanism still has its

weakness. It is not supported by a Management Information System (MIS). The IT facilities are inadequately utilized for this purpose. A MIS is likely to facilitate access to information needed for decision making at all levels. Presently the reporting is taking place at a variable pace in each Division and on an ad-hoc basis e.g.: to justify additional funding request from government. Information about all research projects and other programs conducted and supported by the NSF is not saved in one central location.

NSF gets the support of many stakeholders to carry out its activities. It has gained the goodwill of many in the scientific community. In terms of evaluation of project proposals, progress reports and final reports, there is a reliable system, and in the recent past, these activities were streamlined to make the full use of time and available resources.

The budgets, expenditure and other financial information related to completed as well as ongoing projects are kept at the accounting division but are shared with the implementing division as and when necessary.

4.0 Output Assessment

4.1 Brief Descriptions of the Main Outputs

The NSF does not carry out research on its own (except in the area of S&T policy) and does not develop technologies. It financially supports and coordinates research and technology development in other institutions.

1. Technologies developed

Following are considered as significant achievements on the research carried out under Research and Development schemes.

- Biological Control of Mosquitoes by Bacteria and Fungi.
- Biological Control of Vegetable Pests by *Bacillus thuringiensis (Bt).*
- Custom made elbow prosthesis in treatment of bone injuries.
- Electronic Devices for Energy Saving, Design & Prototype Fabrication.
- Durability Properties of Earth Buildings.

2. Technologies transferred to industry / entrepreneurs

Following are considered as significant achievements on the research carried out under the Technology Grant schemes.

- Height Adjustable Coconut Plucking Pole.
- Manufacture of an environmentally friendly & safety cargo boat to have a local transportation.
- Identification of means and methods to enhance the productivity of gherkins grown inside green houses.
- Quality improvement of prototype diesel fuel pump test bench.

3. Information Dissemination / Extension

Information dissemination has been done mainly through workshops and seminars (127 during the evaluation period) and competitions (13 during the period). The NSLRC has been modernized and updated during last four years. Following are some of the successful events conducted by NSF.

Global Forum of Sri Lankan Scientists

In December 2011, NSF in collaboration with UNESCO organized the 'Global Forum of Sri Lankan Scientists' in an attempt to harness the knowledge of expatriate and local scientists for the development of the country. Thirty nine expatriate and foreign scientists from UK, USA, Australia, Japan etc. and around 225 local scientists along with policy makers and stakeholders from public and private sector, industrialists and entrepreneurs participated. Several collaborative projects have originated at this forum. Six projects have been so far completed, six are ongoing and another five projects are in the initial stages. This is a commendable attempt and the outcome of the Global Forum should be followed up and the possibility of arranging more of such forums should be looked into.

Nanotechnology Campaign

The NSF has organized six Nanotechnology awareness workshops. Each workshop consisting of approximately 50 and a total of 315 Science Directors and in-service Instructors of the Department of Education covering all the provinces of the country to provide basic understanding and knowledge on practical applications of Nanotechnology.

World Science Day

World Science Day School Programs were held annually. In 2012 the Science Day celebration was held with the participation of (Hon) Prof. Abdul Kalam, Former President of India. The theme was 'Innovation for Development'**.** Around 2000 students representing all provinces in the country attended this ceremony. Science day competitions have made a commendable impact in popularizing science among schools. The review panel recommends extending this program to other rural schools by establishing school science societies in them.

Digital Library

The digital Library of the NSF has expanded with the addition of over 7000 full text documents. The digital library provides facilities to browse search and download all NSF publications online.

Database Development

Sri Lanka Science Index Database has been established and during 2012 has been updated with the addition of 9073 records showing a very high growth rate. Newspaper articles database, Sri Lanka Association for the Advancement of Science and the Research Grants databases were updated.

National Digitization Project

A five year National Digitization Project has been launched to strengthen the current *National Network of Institutional e-Repositories*. The objective is to offer a mechanism to access the total scholarly literature output in the country online for easy access by scholars to support and promote productive research. Phase I of the project covering six institutions in the country was initiated and is in progress.

Services to Other Libraries on Computer Catalogues/Databases

The services were provided to libraries in the county on 73 occasions in developing new databases, improving the existing databases and providing support in trouble shooting needs. Ten new catalogs of other libraries including the National Museum library were hosted in the NSF server to increase visibility of the resources in the respective libraries.

Science Communication Workshop

Scientists from the Universities and Research Institutes have been trained on Science Communication to the public. Science Works Exhibition Mobile Interactive Science

Exhibition of the Singapore Science Centre was held for the schools and general public. Students from more than forty five schools and large number of general public gained hands on experience in interactive science exhibits. The exhibition was aimed to popularize science as well as to provide an opportunity to learn scientific concepts behind day to day life.

Vidunetha Training Programme

Workshops have been held to train science teachers of Grade 6 to 9 of the Homagama Educational Zone in conducting science projects. This program was conducted in collaboration with the Ministry of Education with the objective of improving the investigative abilities, inquiry based thinking and creativity of the school children of Grade 6 to 9. Oral and poster presentations were made by the students based on their science projects.

Sri Lanka Science & Engineering Fair (SLSEF) and Science Research Projects Competition (SRPC)

Under the above program training/review workshops and competitions were conducted and more than 50 students' projects were carried out. Ten projects were competed and one was selected to participate at this Intel International Science & Engineering Fair 2012 which was held in USA.

Sri Lanka Olympiad Federation

Sri Lanka Olympiad Federation was established with the eight National Olympiad coordinating bodies in November 2011 with the assistance of the NSF. Five school teams representing international Olympiad competitions were partially funded by the NSF.

4. Publications

Research Publications

Journal of the National Science Foundation (JNSF) is the only journal to be included in the SCI in the country. Four issues of the JNSF have been published per year. JNSF achieved a Thomson Reuters impact rating of 0.232.

Sri Lanka Journal of Social Sciences (SLJSS) entertains suitable social science articles focused on Sri Lanka and/or other South Asian countries. Two issues of the SLJSS per year were published.

Other Publications

The publication "*Akramanasheelee shaka*" for the general public was published and the printing of the publication "Introduction to Nuclear Technology" was sponsored by the NSF.

Mihimandala video series - A series of video programmes " Mihimadala NSF Science Magazine on TV" was produced to create an awareness among the general public/school children e- Science and Technology at e-Swabhimani 2011 organized by ICTA. This also won the "Manthan Award South Asia 2011" an international award from Digital Empowerment Foundation, New Delhi, India. This award recognizes and felicitates emerging and best practices in e-content for education and development across the South Asia.

Vidurava Science Magazine - Three issues of the Vidurava Science Magazine in all three languages were published every year and were distributed to the schools of the registered School Science Societies, Universities and Vidatha Resource Centers.

Science Tech Alert is a regular release of NSF which informs the scientists the available opportunities, seminars and other relevant activities happening locally and internationally.

Only limited numbers of children stories (four) and science books (seven) have been published during last four years. Number of science books available in local languages is limited and the review panel proposes to make additional funds available for science popularization through the publications (in all three languages) targeting school children.

5. Patents

During the period of evaluation NSF has assisted in establishing 79 local patents and has financially assisted one foreign patent.

6. Services (Consultations, Advisory etc.)

The WHO program for a multidisciplinary, multi-sectoral research program to investigate and evaluate Chronic Kidney Disease in the North Central Region in Sri Lanka (CKDu) was supported by Ministry of Finance funds administrated through the NSF. NSF monitored the project based on its normal progress review mechanisms up to the completion. The WHO has shared a paper prepared for publication.

Competitive Research Grants

The competitive research grant scheme was continued to provide assistance to supplement the financial, physical and manpower resources available for scientific research by supporting basic and applied scientific research in the scientists' own institution. A total of 68 grants awarded in 2011, while 37 grants were completed. For the 2012 call for applications, 94 applications were received; 82 were processed, and 20 were approved.

Postgraduate / Postdoctoral Awards

Three new scholarships were awarded up to August 2012. Eight applications received for 2012. During 2012, two Fellowships were awarded, while three were ongoing. The Postdoctoral Research Scientists award provides an opportunity for scientists/ engineers with good research record and postdoctoral degrees to carryout full time research within the country.

NSF has twenty nine research staff of which six are PhDs, three are M.Phil and eleven are M.Sc. The areas of expertise are Science (19), Engineering (1), Agriculture (7) and Veterinary Science (2). With this talent the Institute should look into the possibility of generating funds internally and provide better remuneration to the staff.

Technology Grant Schemes

Following Technology Grant Schemes were implemented during the assessed period:

- Support for Technology Development.
- Support to Start up Businesses based on novel technologies.

During 2012, fifty one Technology Grant Applications were received. Eight were approved by the BoM for funding as seven for Tech Development and one for Start Ups.

National Network of Institutional e-Repositories

The foundation was laid in 2010 for a *National Network of Institutional e-Repositories* among universities and research institutions in the country. The current network covers seventeen libraries. With a view to develop a regional network, a workshop has been conducted to train librarians of nine countries in the Asian region on D Space Digital Library software.

Popularization of Science

Services for Schools & School Children: School Science Society Programme

Over 120 School Science Societies have registered with the NSF during this period (totaling up to 630 registered schools). NSF has provided the service of the resource persons to deliver lectures on a range of scientific topics for 10 school science programmes. Two workshops were conducted for science teachers to empower them on strengthening the activities of the School Science Societies in order to popularize science among the school children.

7. Trainings

NSF staff has participated in 122 local and 46 foreign training programmes during last four years.

8. Others (Miscellaneous)

National Thematic Research Program (NTRP*):*

This scheme is useful to direct Research and Development to address the need of the society. NTRP was introduced to identify multidisciplinary, multi-sectoral mission-oriented research activities based on national needs through a structured process with end-products that can be harnessed readily in tackling on the ground issues and to contribute more effectively to the national development. Four themes have been selected as Food Security, Water Security, Energy Security and Climate Change.

Seven grants have been awarded under the theme Food Security in 2012.

National Nanotechnology Initiative

A National Nanotechnology Conference was held in Colombo, late August 2012, with over 150 participants from various sectors.

Research Equipment & Spare Parts Grants

In 2011 and 2012, 34 Research Equipment Grants and 08 Spare Parts Grants were awarded, to enhance the capacity of the research institutions & universities by providing some items of equipments for research. A survey is being conducted on the above subject to study the impact of Equipment Grants Scheme of NSF towards the infrastructure development of the S&T institutions in the country.

Travel Grants & Scheme

Under the Travel Grant & Scheme in 2011/2012 period, 176 applications were received and processed of which 60 successful applicants were awarded.

Overseas Special Training Program (OSTP)

Under the OSTP, thirty applications were received and processed of which 28 successful applicants were awarded.

International Partnerships for Science & Technology (IPSAT)

Three ITI research scientists were trained and one Post Doctoral training at University of Texas, Arlington, USA was funded under this program. The training was on Pharmaceutical R & D.

International Workshop on National Innovation Systems

"Operational Strategies and Management Aspects" was held in 2011. Eleven country representatives from Thailand, Korea, China, India, Australia, Maldives, Pakistan, Malaysia, Philippines, Iran and Sri Lanka and seventeen officials from Local S & T Institutes participated at the Workshop gained broad understanding; about Network Information Service (NIS) of the different countries and on various methodologies involved in the innovation system studies, data analysis and interpretation. This will be followed up through the STEPAN Secretariat.

STMIS - S & T Management Information System

STMIS database, (*www.mis.nsf.ac.lk*) is a computerized information system on Science and Technology which is online and provides S&T information and indicators for policy planning and implementation. It undertakes registration of S&T personnel in the country. Around 4600 scientists have been registered and identity cards are being issued to them. Database is continuously being updated to cover the whole S&T sector.

4.2 Quantitative Summary of Outputs (2009 – 2012)

This framework for output identification needs to be tailored to the activities of individual organizations. The panel should feel free to include additional outputs when necessary.

Category	Number			
	2009	**2010**	**2011**	**2012**
1. Technologies Developed *(NSF doesn't develop technologies. We only financially support development of technologies)*				
• New products / technologies	01	-	-	-
• Improved products / technologies / laboratory methods	02	01	02	02
• New planting materials / seed varieties	-	-	-	-
2. Technologies transferred to industry / entrepreneurs				
• Technologies developed locally	-	-	-	-
• Foreign technologies adapted and transferred	-	-	-	03
3. Information Dissemination / Extension				
Publications				
• S & T institutional Review Reports	-	-	-	-
• Training Manuals	-	-	-	-
• Advisory Leaflets	-	-	06	-
• Maps	-	-	-	-
• Posters	-	-	01	-
Dissemination events				
• Workshops and Seminars	37	19	29	42
• Conferences	03	03	03	01
• Exhibitions	01	01	03	01
• Media Events	-	-	-	02
• Open Days	-	-	-	-
• Demonstrations	-	-	-	-
• Competitions	02	03	04	04
4. Publications				
• Research papers in ISI journals	-	01	-	-
• Other Research Papers	-	01	02	-
• Referred Abstracts	03	10	01	01
• Conference Proceedings	-	01	-	-
• Books and Monographs	02	03	01	01
• Technical Reports	-	05	-	02

• Research Reports	-	-	-	-
• Book Chapters	-	02	-	-
• Science Magazines (in all 03 languages)	09	09	09	09
• Science Books	02	03	01	01
• Children Stories	04	-	-	-
• Journals	06	06	06	04
• Policy Brief	01	03	02	02
• News Letters	04	05	06	03
• Other Publications	01	-	-	01
5. Patents				
Individual				
• Local *Patents (NSF doesn't own patents, consultation was provided on patentability/ filling applications etc)*	25	21	12	21
• Foreign Patents *(Financial supported)*	-	-	01	-
Institutional	-	-	-	-
• Local Patents	-	-	-	-
• Foreign Patents				
6. Services (Testing, Calibrations, Consultations, Advisory and etc.)				
• Policies developed	-	02	01	-
• Reviews of S&T institutions	-	-	-	-
• Research grants awarded and administered	10	08	76	38
• Funding for training programs and other S&T activities	-	6 Travel Grants	19 OSTP grants + 37 Travel Grants	17 OSTP Grants + 36 Travel Grants
• Monitoring of Technology/ Research Projects (ongoing)	196	140	151	135
• Data bases developed	-	03	05	05
• Databases of Scholarly literature of local origin - 03 databases (ongoing/ Sri Lanka Science Index, SLAAS database, Newspaper Articles database)-***No. of new records added***	8650	10965	9181	5769
• NSF Digital Library of full text literature	Digital library of all NSF Publications	Updated	Updated	Updated
• National Network of Institutional repositories (Institutions joined)	05	06	03	04

• S&T surveys and maps • Science popularization activities • Environmental impact assessments	- 07 -	05 08 -	05 09 -	04 10 -
• Instrument calibrations • Consultancy services • Testing and analytical services • Vaccines / seed production and distribution • Germplasm conservation • Recommendations in S&T matters	- - - - - -	- - - - - 15 from 3 studies	- - - - - -	- - - - - 17 from 2 studies
7. Training ***Staff training programs*** • Local • Foreign ***Training programs for stakeholders*** Attended as Resource Person	 41 10 01 07	 32 11 - 03	 26 12 06 02	 23 13 03 02
8. Other • Awards (through NSF Research Award Scheme, SUSRED Award Scheme & S & T Awards) • Implementation of the IDRC funded project "Development of Biotechnology in SL" • Coordination of projects between local and expatriate scientists originated at the Global Forum	- -	15 - -	- 01 -	26 01 17

4.3 Staff Strength

The Permanent Staff in the Institution

Staff		2009	2010	2011	2012
Scientific	Research Staff	24/40*	24/40	23/38	27/38
	Support Staff	11/11	11/11	11/11	17/17
	Librarians / Information Officers	06/08	06/08	06/08	05/08
Accounting	Accountants	03/ 04	03/ 04	03/ 04	04/04
	Support Staff	14/16	14/16	12/15	12/15
Administration	Administrators	02/ 02	02/ 02	03/04	03/04
	Support Staff	28/62	27 /62	26/52	37/46
Other		10 /14	10 /14	11/12	10/12

*Note: 24 - No. of Cadre positions filled
40- Total Cadre Positions

Research Staff Based on Areas of Expertise

Areas of Expertise	2009	2010	2011	2012
Science	15	15	14	19
Engineering	1	1	1	1
Medical & Health Science	-	-	-	-
Agriculture	6	6	6	7
Veterinary Science	2	2	2	2
Other	-	-	-	-

*Note: Include Director and Additional Director

Highest Level of Qualification of Research Staff

Qualification	2009	2010	2011	2012
PhD.	6	6	6	6
M.Phil	2	2	2	3
M.Sc.	9	9	9	11
B.Sc.	7	7	6	9

*Note: Include Director and Additional Director

5.0 Productivity of the Institution Based on Outputs and Science and Technology Staff Strengths

These comments are based on NSF's outputs and staff strength during the period 2009 – 2012 as provided by the Director NSF in the self-assessment report and subsequent updates. Comments are given in accordance with the guidelines provided in the review manual prepared by NASTEC. There are eight output categories defined in the manual.

They are;

a) Technologies developed
b) Technologies transferred to industry/ entrepreneurs
c) Information dissemination/ extension
d) Publications
e) Patents
f) Services
g) Training
h) Other

From 2009 – 2011 the NSF operated with approximately 60% of the allocated cadre of Science and technology personnel. In 2012, the situation improved to 70%. Its performance/outputs were also affected by either non disbursement or delayed or irregular disbursement of the allocated funds.

Within this context the productivity of the NSF during this period is truly commendable. Its outputs cover a wide spectrum which cut across all eight categories defined in the review manual. Although the outputs have been quantified for the purpose of assessment, in assessing productivity the quality of an output is as or even more important than numbers. A detailed description of the outputs is given above to enable one to appreciate their qualitative aspects.

Considering both numbers and quality the review panel graded the outputs in the eight categories defined in the review manual, using a five point Likert scale (Unsatisfactory – Satisfactory – Good – Very good – Excellent).

The panel's conclusion regarding each aspect is as follows:

- Technologies developed : Good
- Technologies transferred to industry/ entrepreneurs : Satisfactory
- Information dissemination/extension : Excellent
- Publications : Very good
- Patents : Satisfactory
- Services : Excellent
- Training : Very good
- Other (miscellaneous) : Very good

Although the number of technologies developed is not large in qualitative terms majority seem to be of great utility value and some are of significant national relevance.

Technology transfer is clearly in an embryonic stage at the NSF. We note that three technologies have been transferred to industry in 2012. This aspect needs to be improved in the future through greater industry linkages.

Information dissemination and extension is clearly the forte of the NSF. The wide variety of methods involved, their wide coverage, the numbers and the high quality of the product (e.g. Mihimadala video series) makes us conclude that the productivity in this aspect to be truly excellent.

Publications considered are of two types. Research or research based publications and educational publications. The output in educational and science popularization publications is excellent in both numbers and quality. However, there is room for improvement in research publications, based on NSF supported research. There is a paucity of publications in indexed and peer reviewed journals. Majority are refereed abstracts. We note that there are a few technical reports and policy briefs of merit and national relevance.

The regular publication of the Journal of the National Science Foundation (JNSF), which is the only Sri Lankan Journal to be included in the Science Citation Index (extended) (SCI), is to be highly commended This is referred to in the overview of performance in relation to national development.

The output in patents can be termed satisfactory at best as they are not based on NSF supported research or technologies. The numbers are of individual inventors/ scientists where NSF has supported and facilitated the process of obtaining a patent.

In terms of their mandate it could be reasonably expected for the NSF to obtain patents on products developed with its support. The panel is not aware whether patents obtained by SLINTEC have been included in this tally. The panel feels that NSF could justifiably claim some credit for patents filed by SLINTEC.

The output in services is excellent with a wide variety of activities of high quality. They are described in the report above. This is to be especially appreciated as it is in spite of limited scientific staff numbers.

Training has been graded as very good based on numbers, variety and quality. They have been viewed positively by both staff and stakeholders. However, the largely opportunistic nature of staff training is a reason for concern.

In the other or miscellaneous category there are several activities such as the Global Forum of Sri Lankan Scientists, the National Nano- technology Initiative and NSF research award scheme which merit a very good grading based on national relevance and impact.

In conclusion the panel views the productivity of the NSF during the period (2009 – 2012) given the constraints within which it worked, to be highly commendable. There are a few areas such as technology development and transfer; number of research publications in indexed journals and obtaining patents on NSF supported work, where there is room for improvement.

6.0 Overview of the Performance of the NSF

NSF plays a multifaceted role acting as a source of funding, a source of important scientific and technological information and as a mediator/facilitator to promote activities related to Science & Technology in the country's higher educational and research institutions, and in the country in general. In order to achieve success in these areas, NSF which is governed by a Board of Management headed by the Chairman, has set up several divisions that are overseen by the Director who is the Chief Executive Officer (CEO) of NSF, with the assistance of the Additional Director. Divisional activities take place based on the recommendations and suggestions made by respective advisory boards, working committees and expert panels. Each Division, headed by (other than the Administrative Division) a scientific officer, comprises several scientific officers and management assistants and/or technical assistants.

In order to assess the overall performance of the NSF it is necessary to look at the performance of the individual divisions. What follows is a brief critical review of the divisions and their role.

Science & Technology Policy Research Division (STPRD)

NSF has set up the STPRD with the objective of undertaking science, technology and innovation (STI) policy research in the areas specified by the mandate and to make recommendations towards policy formulation and develop various databases and statistical hand books relevant to all sectors of STI useful for decision making. The National Research & Development survey conducted biennially since 2004 is a key activity.

Contribution made by the division to publish the Journal of National Science Foundation, a journal indexed in the SCI is commendable. It is the only division in the NSF that performs research studies, pertinent to S&T policy. The results of these studies should be in the public domain and should be accessible to all policy makers. This is no bar however to publication of these studies in a peer reviewed journal with approval of the NSF. The authorship has to be decided using the globally accepted criteria.

STPRD also maintains information on Science & Technology through Science and Technology Management Information System (STMIS) database, an important tool that enables NSF to achieve some of its goals. Currently however the quality and reliability of the information in this database is unsatisfactory. This situation needs to be rectified urgently. Review panel also noted the absence of a statistician in the STPRD which deals mainly with analysis of scientific information.

Research Division (RD)

RD is well established and its major function is to award research grants under different types of grants schemes to the scientific community in Sri Lanka. RD thus receives the majority of funding allocated to the NSF. In addition to supporting the basic and applied sciences through a competitive grant scheme, RD has designed several other schemes to promote the scientific research culture in the country. These include the Postdoctoral Research Fellowship Scheme, the National Thematic Research Program (NTRP), the Research Equipment Grant Scheme, the Spare Parts Grant Scheme, NSF Research Awards, Quality Assurance of Research and newly introduced policies on National Biotechnology and National Research Development & Innovation. In general, the activities of the RD were highly appreciated by the stakeholders at their meeting with the review panel. Recent steps

that the RD has taken to minimize the delays in handling research grants by introducing centralized research proposal evaluation and research progress monitoring schemes are also commendable.

Absence of scientific personnel in the division with qualifications from the area of social sciences and insufficient interest among social scientists for the NSF fellowship scheme and publication in the SLJSS were indicative that the social science initiative of the institution is not having the desired impact as yet.

In the past, there have been RD coordinated visits to the institution of the research grantee as a part of progress monitoring. It was learnt that this monitoring mechanism is still practiced on an irregular basis due to lack of logistic support.

Technology Division (TD)

The Technology Division of the NSF has been established fairly recently (in 2005) with a view to promoting technology development and innovation in the country. Activities of the TD have been designed to foster innovation in all areas of S & T, including biotechnology and nanotechnology. TD provides financial support for technology development projects with the support base extending to even grass root level inventors. In addition to awarding technology grants, the TD provides awards for excellence in technology, assists stake holders in intellectual property awareness & protection to encourage technology development & innovations to generate new or improved products. TD is also involved with the National nanotechnology initiative. The activities of the TD and RD complement each other as the TD serves to convert research knowhow into technology transfer. TD has made good progress considering that it is relatively young, compared to the RD. However, the review panel feels that as the TD has the potential to reach out to stake holders of different levels, its activities can be strengthened further.

The review panel learnt that, despite the initiative taken by the NSF and its involvement in nanotechnology, it has not received any dividends from the private-public partnership, the Sri Lanka Institute of Nanotechnology (SLINTEC).

Science Popularization Division (SPD)

SPD conducts a number of activities in order to popularize science in the country. School Science Society Program, World Science Day Celebration, Sri Lanka Science and Engineering Fair and program for capacity building of science teachers are some examples. SPD is responsible for the timely publishing of the Journal of National Science Foundation which is now recognized as an indexed journal by international sources.SPD has taken steps to publish science books on popular science topics, scientific magazines and newsletters etc. which are currently circulated among School Science Societies, 'Vidatha' centers and universities. It was learnt at the stake holders meeting, that some of the text books published by the NSF previously are no longer published.

SPD also conducts several science popularization programs in collaboration with organizations such as Sri Lanka Rupavahini Corporation (SLRC) and Sri Lanka Broadcasting Corporation (SLBC). Award winning 'Mihimandala' program is one such activity that the SPD conducts in collaboration with the SLRC.

SPD provides financial support to Institute of Physics, Sri Lanka (IPSL) and Institute of Biology, Sri Lanka (IBSL), to conduct highly popular Olympiads in Physics & Astronomy and Biology respectively. The review panel is of the view that the science popularization programs conducted by SPD can be improved to reach a broader audience through formal linkages with professional organizations such as Sri Lanka Association for the Advancement of Science (SLAAS), Sri Lanka Medical Association (SLMA) and Institute of Engineers, Sri Lanka (IESL).

Given the number of activities and the extent to which the SPD can reach the masses through its programs, it has taken inadequate steps to conduct an impact assessment of NSF publications, both popular science books and text books, to survey their market potential and to obtain recognition through bodies such as National Institute of Education (NIE) for their use in schools as supplementary readers. Such measures will enhance the capacity of SPD for generating funds through its publications. Attention given by the SPD to the Social Sciences is inadequate.

National Science Library and Resources Centre (NSLRC)

National Science Library and Resources Centre (NSLRC) of the NSF acts as a source of dissemination of S &T information in the country by maintaining a data base on NSF publications, Sri Lankan scientific publications and resources available in Sri Lankan libraries. The objective is to serve as the national repository of S&T literature. The efficiency of the information service has been enhanced through a network (Sri Lanka Science & Technology Information Network) operated among S&T libraries in the country. Currently, the division is working towards the digitization of NSF publications. Division provides assistance for enhancing IT applications in SLSTINET member libraries and library networks. It also conducts services to the library community in the country through training programs and seminars.

Review panel found that not all publications and other sources of information from the NSLRC were equitably available in the second national language, i.e. Tamil. This imbalance needs to be rectified. It was also observed that the information network needs to be extended to areas such as Social Sciences and Archeology.

Note: It was learnt that under the current administrative structure, SPD and NSLRC along with the Printing Unit have been merged into the newly formed Information and Knowledge Division (IKD).

International Liaison Division (ILD)

ILD works to foster the interchange of scientific information among scientists in Sri Lanka and foreign countries promoting and assisting Sri Lankan scientists and technologists to participate in meetings, short term research work abroad and arranging for expatriate scientists and technologists to work in Sri Lanka on short term assignments by providing financial assistance. It has played an active role in events such as the Global Scientific Forum which was held in 2011 in Sri Lanka, providing opportunity for the Sri Lankan scientists to learn about the work carried out by Sri Lankan expatriate scientists. It was found that ethical issues of some research collaborations initiated between Sri Lankan scientists and expatriate scientists needed review prior to implementation. The nanotechnology model where regulation was coupled with development should be extended to biotechnology.

Administrative, Finance and Internal Audit and IT Divisions

Major task of the Administrative, Finance and Audit divisions is to assist the NSF in human resources, financial asset and logistics management following the regulations and guidelines accepted by the government institutions. These divisions therefore, play a supporting role to the RD, TD, SPD, NSLRC and the ILD that conduct scientific activities. The success achieved by these divisions is a reflection of the quality of the support services. Though these divisions seem to practice standard operational procedures in a fair and transparent manner the panel noted the absence of a manual of procedures approved by the DMS. This could potentially hinder administrative decision making and promote slavish adherence to outdated "R&R".

The Information technology (IT) unit has the technical and human resource capacity to adequately support all IT needs of the NSF. In fact it`s capacities are not utilized to its full potential. At present, it is being further strengthened with support from UCSC under ICTA supervision. This should facilitate even better and rapider access to information in the future.

In conclusion, the NSF is functioning well, within its ambit and is on track to achieve five out of the six goals it has set for itself in the Corporate Plan 2013-2017. However, in goal two which addresses the issue of technology development and transfer it is lagging behind. The Technology Division is performing well within its limited capacity. The limiting factor is the rather conventional mindset of the NSF in this regard. Lateral thinking and innovative approaches such as promoting academia-industry incubators may be needed to bridge the gap.

7.0 NSF's Contribution to National Development

The review panel is quite familiar with the tremendous contribution the NSF and its predecessors have made to national development over the last four and a half decades.

During the last four years (2009 – 2012) NSF`s contribution has been especially significant. In the post conflict Sri Lanka, government policy has emphasized the need to move towards a knowledge driven society and economy. There has been a special thrust towards science and technology and the need for knowledge creation, innovation and technology transfer as means of improving the quality of life and standards of living. This socio-political and economic context seems to have galvanized the NSF into action and it has come up with several new initiatives. During most of this period the NSF has been fortunate to have a mature scientist at the helm of policy making as the Minister in charge.

There is a very wide spectrum of NSF activities which have an immediate or distant impact on national development, but in a critical review where brevity is of the essence only a selected few can be highlighted. In the view of the panel the following are those with the biggest impact.

- National Nanotechnology Initiative which led to creation of SLINTEC. The panel especially appreciates the fact that this was coupled with drawing up of a national regulatory framework for nanotechnology and a national awareness campaign on nanotechnology. This is a comprehensive intervention which will serve as a benchmark for such activities and has succeeded in taking Sri Lanka to the cutting edge of science. The panel however notes with regret that the economic benefits of this groundbreaking initiative have not accrued to the NSF as SLINTEC has become totally independent of the NSF.

- The regular publication of the Journal of the National Science Foundation (JNSF) and its inclusion in the Science Citation Index (SCI) is a significant achievement as it provides local scientists a platform to reach out to the rest of the global scientific community. The panel notes with concern that very few of the NSF grantees have made use of this platform

- NSLRC`s contribution in making both local and global scientific information readily accessible to all Sri Lankans is highly appreciated. The panel feels that it should be further supported with resources to complete the task they have embarked on.

- There is one activity that the NSF has done in the past and continues to do at present which is unsung of and little appreciated except by the recipients viz. Supporting basic research through research grants which often facilitate the researcher getting a post graduate degree. This is tremendously important in scientific capacity building and in generating some basic knowledge which could lead to nationally relevant applied research. The panel strongly recommends that NSF continues to support basic research.

- Not all initiatives achieve success. But they deserve credit for trying. The effort by the NSF to bring social scientists into the mainstream of science falls into this category. The progress report of the National committee on Social Science is

impressive but the panel feels that there is a long way to go in achieving this objective. Somehow social scientists do not seem to feel that the NSF is their forum. The failure to sustain regular publication of the Sri Lankan Journal of Social Science (SLJSS) is evidence. The panel congratulates the NSF for its effort and recommends it to persist with it. In this respect it would be desirable for the NSF to recruit at least one social scientist to its scientific staff.

- There are several other aspects of NSF work like science popularization in schools, provision of S&T data for policy making, development of national policy on biotechnology, national thematic research program which have great potential to contribute national development.

- There are some initiatives which are yet in proposal form or in an embryonic stage of development which have tremendous potential if carried forward correctly. These include the establishment of a national science park/centre, technology development and transfer through science/technology incubators with academia-industry collaboration. These will not only contribute to national development but will enable the NSF to generate its own income.

8.0 Recommendations

In general, NSF has developed into an organization that provides valuable services to its stake holders. This was well reflected during the meeting that the review panel had with a number of stake holders including senior university academics, representatives from research institutes, private organizations, schools and the general public. In order to further strengthen and expand the scope of its activities to the benefit of both the stake holders and the employees of the NSF, the review panel wishes to make the following recommendations, taking into consideration the progress that the NSF has made during the period from 2009-2011.

Administrative and Financial

- Review panel recommends that there needs to be a properly approved manual of procedures in order to streamline the activities of the NSF.

- NSF should continue to support both basic and applied research, maintaining the existing balance of; 40% - basic research**:** 60% - applied research ratio, while encouraging technology oriented multidisciplinary research. Field visits to the research grantees' institute/organization as a part of research progress monitoring is a considered a good practice and should be continued in a regular manner.

- Measures should be taken by the NSF to strengthen the programs/activities and human resources in the area of social sciences in order to raise it to the level of other S & T projects supported by the NSF.

- NSF should take the leadership on matters related to professional ethics and ethical aspects in research, especially in the life sciences by reviving its ethical review committee.

- Financial support for the period of evaluation has been received mainly from the treasury. Fund allocation has shown a significant improvement over the period of three years with the majority of funds being allocated to the RD. There is a significant difference between the funds that have been spent by the NSF and funds that have been allocated. This difference is attributed to the untimely and insufficient release of funds by the treasury. Both increased funding and its timely release is important for the smooth functioning and improved services of the NSF.

- It is important that the NSF initiate private-public partnerships through links and MOUs in order to receive financial benefits and to develop human resources. NSF should look for ways to revive its link with the SLINTEC. The role of the ILD may also be strengthened to the extent that it can liaise with foreign funding organizations to obtain financial support for training Sri Lankan scientists, researchers, technologists and employees of the NSF.

- The management of the NSF should consider the generation of funds using its own resources. For example, review panel identifies the SPD, NSLRC and the Printing Unit as potential fund generating divisions/units provided that proper marketing strategies are used.

Dissemination of Information

- NSF should have a mechanism to share the information generated by some of its divisions within and outside the organization and, to be used for policy planning. Properly maintained data bases such as STMIS can be utilized very effectively by the NSF for setting up advisory boards, evaluation panels, progress monitoring committees and review panels for NSF publications. Thus it is recommended strongly that this data base be updated with accurate information.

- NSF policy on publication should be reviewed with respect to prioritizing their publications in terms of importance, demand, the required recognition and also the validity of materials being published. Publication of the Journal of Social Sciences should be streamlined. Consideration should be given to publish materials in both state languages whenever possible.

- Mechanisms should also be in place to make the employees of the NSF and its stakeholders to be aware of the achievements and outputs of the NSF and to receive their feedback. Obtaining the views of employees at all levels within the organization may prove useful when formulating the future plans.

- NSF should take the leadership to disseminate scientifically accurate information to the public, as provided by respective expert/s in the field/s, on day to day problems of national importance (e.g.: Chronic Kidney Disease in certain areas of the country, Toxic waste from industries and its effects on environment, Natural disaster related accidents etc.)

Human Resources and Work Environment

- It is recommended that a mechanism be in place to recognize qualifications (e.g. postgraduate qualifications) and/or exposure gained through relevant training programs for promotion of employees at all levels within the organization.

- NSF should take measures to provide relevant training opportunities to employees at all levels based on a training needs assessment and ensure that such training opportunities are effectively utilized through an incentive scheme.

- The management of the NSF should take measures to improve the facilities such as health benefits (and loan schemes) for its employees. By combining with other scientific institutions it may be possible to provide employees with a subsidized health insurance scheme.

- NSF is located on a spacious prime land in the City of Colombo where essentially all the NSF employees occupy a single multi-story building in a congested environment. NSF should consider taking measures to minimize the congestion in the building interior by upgrading the building infrastructure to provide better ergonomics (both interior and exterior) to its employees.

Appendix: Management Assessment

NSF Review Report

I. Management Practices Assessment

(1) Always used/ always considered/ involved/analyzed	≡	**Strong**
(2) Occasionally used/ considered/ involved/analyzed	≡	**Moderate**
(3) Not used/ Not considered/ Not involved/Not analyzed	≡	**Weak**

i.) Assessment of Institutional Response to External and Internal Environment in Planning Organizational Strategy

The external environment of an institution (e.g. consumer/industry needs, government policies, market conditions, partners, and competitors) will critically affect its performance. Science & Technology institutions need to regularly assess these in order to plan and respond effectively to challenges and opportunities, and to deliver results that are relevant and useful.

The external environment of Science & Technology / Research & Development institution is vibrant due to changes in stakeholder conditions and needs. It is important for an institution to periodically review and adjust its directions and goals, to meet these changes. These adjustments in turn may require significant actions, such as changes in focus and programs, organizational structure, and management strategies.

Management Practice	Level of Practice (Performance Indicators)			Comments/ Evidence
	Strong	Moderate	Weak	
Government policies and development goals are used/ considered to establish goals and plan organizational strategy for the institution	*			Corporate Plans for 2009-2012, 2013-2017 indicate consonance with govt policy.
The organizational mandate (as specified by the relevant Act) is considered in strategic planning	*			Clear connection with corporate goals.
The institution is responsive to changes in Government policies and strategies	*			New initiatives like Nanotechnology Initiative and Global Forum of Scientists.

Factors such as strengths, weaknesses, threats and opportunities are considered in strategic planning		*		Good SWOT analysis.
Stakeholders needs are taken into consideration in strategic planning		*		They are involved through National committees.
The Board of Governors is involved in strategic planning	*			They have taken the lead.
The extent to which staff members are involved in strategic planning		*		Room for improvement in this aspect.
Government allocations and alternative funding opportunities (donor funding) are considered in strategic planning		*		Alternative funding sources are not given adequate attention.
The extent to which policies and plans of the organization are reviewed and updated		*		To some extent.

Additional observations (if any)

ii) Planning S & T Programs and Setting Priorities

A program is "an organized set of research projects, activities or experiments that are oriented towards the attainment of specific objectives". Programs are higher in research hierarchy than projects. Program objectives should be consistent with organizational strategies and reflect user needs and development goals.

Management Practice	Level of Practice (Performance Indicators)			Comments/ Evidence
	Strong	Moderate	Weak	
National development goals are considered in planning programs & setting priorities	*			Achieved through working committees those have been set up to address the issues of national importance.

Board of Governors participate in planning and priority setting of program		*		They give the final approval.
The extent to which the staff of the institution participate in programme planning and priority setting		*		Technical Committees and Advisory Committees evaluate the proposals and recommend to the Board of Management for approval.
Stakeholder interests are considered in programme planning	*			There is an excellent selection of stakeholders in all decision making committees.
The extent to which programmes are planned and approved through appropriate procedures		*		Very clear and transparent process implemented through Working Committees and Advisory Boards.
The extent to which the availability of funds (government allocations and other funds) generating funds are taken into consideration in planning programmes		*		The availability of govt funds is given most consideration. Other funding sources are inadequately explored.
The obtaining of necessary equipment is considered in planning programmes				Not applicable to the NSF. NSF procured equipment for grantees in the past but not now.
Stakeholders are represented in the institution's planning and review committees.	*			Very adequately.
The extent to which socio economic and commercialization aspects are considered in program planning.		*		Not adequately. Can be strengthened further.

Effectiveness and efficiency of institutional procedures in approving new S& T programs.		*		Achieved through national committees and advisory panels. Process could be further streamlined.

Additional observations (if any)

iii) Planning S& T / R& D Projects

A project is a set of activities designed to achieve specific objectives within a specified period of time. A project includes interrelated research activities or experiments, schedule of activities to be completed within a specific time period, budget, inputs and outputs, focused towards intended beneficiaries. Projects are the buildings blocks of programs. For an institution to achieve its objectives, it is necessary for projects to be well planned in terms of their expected outputs, activities, and input requirements.

Management practice	**Level of Practice (Performance Indicators)**			**Comments/ Evidence**
	Strong	**Moderate**	**Weak**	
The staff is provided with guidance for project planning		*		Corporate Plan gives the general guidelines. There is no formal training in project planning. They learn it on the job.
Previous research results/data are used for planning projects		*		Reviewers ensure this by vetting the literature review of project proposals submitted for review.
The extent to which the institution follows a formal process for preparation, review and approval of projects	*			Very clear and transparent process. Technical Committees and Advisory Committees evaluate the proposals with help of external review as needed and recommend to the Board of Management for approval.

The extent to which organizational plans (e.g. medium-term plan, corporate plan, strategy etc.) are used to guide project selection and planning		*		The research projects are planned by individual scientists based on their interests. All other projects are planned by NSF committees and staff guided by the rolling strategic plans.
Multidisciplinary projects/ activities are encouraged by the institutions	*			Priority is given for multidisciplinary research by the Working Committees and Advisory Boards. NTRP set up especially with this objective.
Foreign collaborations are encouraged and incorporated in planning.		*		'Global Forum of Sri Lankan Scientists' was especially for this purpose. International Liaison Division coordinates the partnership for S&T (IPSAT).
Partnership with private sector is encouraged by the institution		*		Not adequately. There is a need to proactively consider commercialisation potential at project approval stage. There are a few final products that have been taken up by the private sector.
The extent to which development research/activities are considered in planning projects		*		Sizeable proportion of the funds is allocated for development oriented applied research. But the outcome is moderate.
The extent to which basic research are considered when planning projects	*			Basic research is strongly supported. Much appreciated by scientific community.

The degree to which adverse effects on environment are considered in planning projects	*			Adequate. Clearance from relevant regulatory agencies mandatory where applicable.

Additional observations (if any)

iv) Project Management and Maintenance of Quality

Proper project management and quality assurance/improvement practices are needed to ensure effective research operations, the quality of output and achievement of desired objectives.

Management Practice	Level of Practice (Performance Indicators)			Comments/ Evidence
	Strong	Moderate	Weak	
The effectiveness of the procedures for resource allocation at different levels (organization, departments, program etc.)	*			There is equitable sharing of resources between divisions based on need and past performance.
Ensuring that instruments, equipment and infrastructure facilities are sufficient for implementation of projects		*		Not very relevant to the NSF.
The effectiveness of administrative procedures and support for project implementation (procurement and distribution of equipment and materials, transport arrangements, etc.)	*			Strong administrative procedures are in-situ. But Manual of Procedures submitted to DMS for approval not returned yet.
Formal monitoring and review processes are used to direct projects towards achievement of objectives		*		Some evidence for this. Intermittent restructuring evident.
The extent to which the researchers are supported by the required technical / field staff.		*		Stakeholders are positive about NSF support.

Ensuring that established field / lab methods, and appropriate protocols are used				Not directly relevant to NSF. But ensured for research projects through the review process.
Research projects/ S& T activities are completed within the planned time frame.			*	This happens rarely. Delay is primarily due to erratic disbursement of funds and logistic c/administrative constraints in the host institution. Stakeholders suggest need for more flexible procurement guidelines.
Ensuring that scientists / researchers have access to adequate scientific information (scientific journals, internet, international databases, advanced research institutes, universities etc.) that strengthens the quality of research.	*			Excellent progress in this respect. Not all scientists are aware of what is available. Establishing a consortium of universities and research institutes to access all high quality databases is a must.
The extent to which quality assurance practices are followed by the institutions		*		There is a need to establish a formal quality assurance mechanism. Move to get ISO9001 is a step in the right direction.
Ensuring that researchers/ scientists have access to computers and necessary software	*			All scientific and technical officers have access to a computer with relevant software and internet access.

Additional observations (if any)

v) Human Resource Management

Availability of an adequate number of qualified staff and effective management of human resources are key determinants of organizational performance. Establishing a cadre of qualified staff takes many years. To keep pace with new developments in science, technology, and management, it is also essential to upgrade staff regularly. Staff planning, selection, recruitment, evaluation, and training are key components of human resources management that need to be in place for effective performance of an institution.

Management Practice	Level of Practice (Performance Indicators)			Comments/ Evidence
	Strong	Moderate	Weak	
The institution maintains and updates staff information in a database (including bio data, disciplines, experience, publications, projects)			*	There is no staff database which is regularly updated.
The institution, plans and updates its staff recruitments based on program and project needs		*		The senior administration and Advisory Committees work on these regularly.
The effectiveness of the selection procedures and the schemes of recruitment	*			Proper mechanism is in place and Senior Management is involved with the process.
Training is based on institution and program objectives and on merit,		*		No training needs analysis. The staff is provided both local and foreign training as opportunities arise. Selection based on program need and merit/seniority.
The effectiveness of the procedures in promoting a good working environment and maintaining high staff morale.		*		Room for improvement. See recommendations.
The effectiveness of staff performance appraisals		*		They are done, but can be better used.

The effectiveness of rewards and incentive schemes in motivating the staff			*	None available at present.
The effectiveness of managing staff turnover, absenteeism and work interruptions.	*			Does not seem to pose a problem at present.

Additional observations (if any)

vi) Management of Organizational Assets

Organizational assets include not only staff buildings, equipment, and finances, but also include assets such as knowledge, technologies developed, intellectual property, and even credibility and reputation. A continuous effort is needed to protect all of these assets, because they are the basis for the sustainability of the institution and allow it to continue delivering quality research and service outputs.

Management Practice	Level of Practice (Performance Indicators)			Comments/ Evidence
	Strong	Moderate	Weak	
The ability of the institution to carry out its mandate and the assigned statutory powers		*		Minimum political interference / has to work with limited funding which is not released on time.
Infrastructure (buildings, stations, fields, roads) is satisfactorily maintained.	*			Very good.
Vehicles and equipment (lab, field, and office) are properly managed and maintained.	*			Limited relevance to NSF. What is there is well maintained.
The effectiveness of procedures to ensure that equipment are in working order				Not too relevant.

The effectiveness of the institution's overall strategy in generation and proper utilization of funds		*		Hardly any strategy for generation. Utilisation of available funds is good.
The extent to which the institution identifies opportunities for income generation and cost recovery			*	Almost none.
The extent to which the intellectual property rights of the institute are protected				NSF did not get any "credit" for SLINTEC products. Publication rights are protected.

Additional observations (if any)

vii) Coordinating and Integrating the Internal Functions/Units/Activities

The planning and coordination of units (departments, divisions, committees, research stations, etc.) and interaction among them are often neglected and it affects the overall performance of the institution. The organization of these units and the overall structure need to be reviewed from time to time to ensure smooth and efficient operations. The planning and coordination of units, logistics, resources, and information flows are necessary to achieve integration and smooth functioning.

Management Practice	**Level of Practice (Performance indicators)**			**Comments/ Evidence**
	Strong	**Moderate**	**Weak**	
The extent to which institution is evaluated internally and restructured based on current needs		*		A new organizational structure and a staff cadre have been introduced.
The effectiveness of internal communication and coordination mechanisms	*			Managed through regular meetings.

Institution's overall direction and coordination are provided by a central planning committee / unit.		*		Corporate Plan gives the overall direction. Policy decisions are taken by the Board of Management. The management decisions are communicated to the Divisional Heads by the Director.
The extent to which different units are assigned clearly defined functions	*			Functions of the Divisions are clearly demarcated and identified.
Responsibilities of research / management staff are clearly identified	*			Corporate Plan Identifies the responsibilities. Administrative responsibilities clearly assigned.
Effectiveness of using appropriate reporting procedures and feedback in management at different levels		*		Gap in communication between lower and higher levels of staff was noted.

Additional observations (if any)

vii) Partnership in Managing Information Dissemination

An important requirement of all S& T / Research & Development institutions is management of dissemination of technology and information to users. The partnership / linking up with other actors in Science & Technology and information system (including, universities, industries, private sector, international research organizations, extension, farmers etc.) promotes information exchange, collaboration, and cost sharing, and ultimately improves the quality and relevance of research.

Management Practice	Level of Practice (Performance Indicators)			Comments/ Evidence
	Strong	Moderate	Weak	
The institution systematically plans and performs dissemination of information		*		It does. But the impact is mainly on the scientific community and not on the general public.
The extent to which the institution plans and maintains linkages with key partners for sharing and dissemination of information		*		Have many linkages with Universities and Research Institutions. Linkages with professional organisations and corporate sector need expansion.
The effectiveness of institutional procedures for technology transfer		*		Much room for improvement.
The effectiveness of the system to obtain feedback from different types of stakeholders		*		Feed back is obtained informally on an ad hoc basis. There is a need for formal systemic feedback.

Additional observations (if any)

viii) Monitoring, Evaluation and Reporting Procedures

Monitoring (assessing ongoing S&T / research activities) and evaluation (evaluating the value, quality and results of research) are key management processes of public-S& T institutions Monitoring and evaluation are also important for determining whether the institution is learning from its earlier achievements and failures. Monitoring, evaluation, and reporting procedures need to be properly designed (i.e. integrated into project planning and implementation) and periodically reviewed, in order to provide useful information for decision-making and accountability.

Management Practice	Level of Practice (Performance Indicators)			Comments/ Evidence
	Strong	Moderate	Weak	
The institution monitors and evaluates (M&E) its own activities periodically		*		It does as evident by intermittent restructuring and modification of cadre.
M&E is supported by an adequate management information system (MIS), which includes information on projects (e.g. costs, staff, progress, and Results).			*	Introduction of well structured management information system is imperative.
The extent to which S& T results and other outputs are adequately reported internally (e.g. through reports, internal program reviews, seminars)		*		Internal reporting does occur but needs to be strengthened to reach all levels.
External stakeholders contribute to the M & E process in the institution	*			By an excellent selection of a cross section of stakeholders in to the relevant committees this has been achieved.
The extent to which the results of M&E are used for project/ research planning and decision-making.		*		To some extent. Can further be streamlined through a well structured data bank.

Additional observations (if any)

Annexures

1. List of Documents Perused

Self Assessment Report of the NSF (2013)
Review Manual NASTEC (2011)
Corporate Plan NSF (2007-2012)
Corporate Plan NSF (2013-2017)
Annual Reports NSF (2009-2011)
Report on Global Forum of Sri Lankan Scientists (December 2011)
Progress Report of Social Science Committee NSF 2013
Sample copies of JNSF, SLJSS, Vidurawa, and Supplementary Readers
National Science & Technology Policy NASTEC & Mof S&T 2008
Science, Technology& Innovation Strategy for Sri Lanka
Mof T&R 2010
The panel also viewed the NSF website, STMIS, all the Databases of NSLRC and other IEC material such as 'Mihimadala'

2. Organizational Structure of NSF