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National Science Foundation
47/5, Maitland Place
Colombo 07.

13.09.2004

Hon. Minister of Science & Technology,
Ministry for Science & Technology
561/3, Elvitigala Mawatha
Colombo 05.

Dear Sir,

**Annual Report of the National Science Foundation
For the period 1st January to 31st December, 2003**

In terms of Section 40 (3) of Science and technology Development Act No. 11 of 1994, I have the honour to submit the Annual Report of the National Science Foundation for the period 1st January to 31st December, 2003 together with.

- (a) A copy of the Audited Income and Expenditure Accounts
- (b) A copy of the Audited Balance Sheet
- (c) Auditor General's Report

Yours sincerely,



M Watson
Director
National Science Foundation

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Introduction

The Institution

The National Science Foundation (NSF) is a state funded institution established by the Science and Technology Development Act, No. 11 of 1994 on 01/04/1998 under the Ministry of Science and Technology. It is the successor to the Natural Resources, Energy and Science Authority of Sri Lanka (NARESA) which was set up in 1982 by Parliament Act No. 78 of 1981. NARESA itself succeeded the National Science Council (NSC) which was established by Act No. 9 of 1968.

Management

The NSF is governed by a Board of Management which consists of the Chairman, Director and Members appointed by the Hon. Minister of Economic Reforms, Science and Technology. The Director functions as the Chief Executive of the institution.

Our Motto

Research is the Foundation of Knowledge

Our Vision

To take the lead in establishing a scientific capability that would have the potential to mobilize the fruits of scientific research to enhance the quality of life of the people of Sri Lanka.



Our Mission

To enhance research and technical capability to create a science culture responsive to the needs and aspirations of the people of Sri Lanka, and to the ever-increasing problems in the living environment, that affect the welfare of the people of Sri Lanka.

Objectives and Mandates

(a) to initiate, facilitate and support basic and applied scientific research by universities, science and technology institutions and scientists, with a view :

- (i) to strengthening scientific research potential, including research in the social sciences, and science education programmes;
- (ii) to developing the natural resources of Sri Lanka;
- (iii) to promoting the welfare of the people of Sri Lanka and
- (iv) to training research personnel in science and technology

(b) to foster the interchange of scientific information among scientists in Sri Lanka and foreign countries;

(c) to award scholarships and fellowships for scientific study or scientific work at 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 and 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;

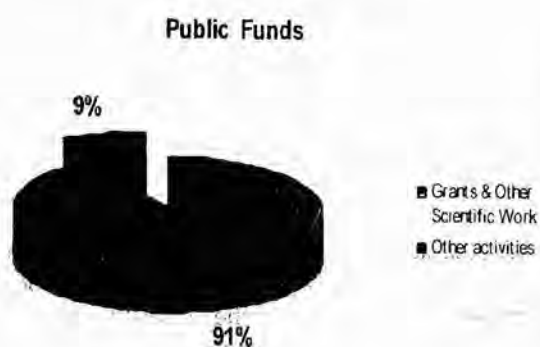
(e) to popularise science amongst the people by funding programmes for that purpose.

Financial Performance

Capital Allocation – 2003

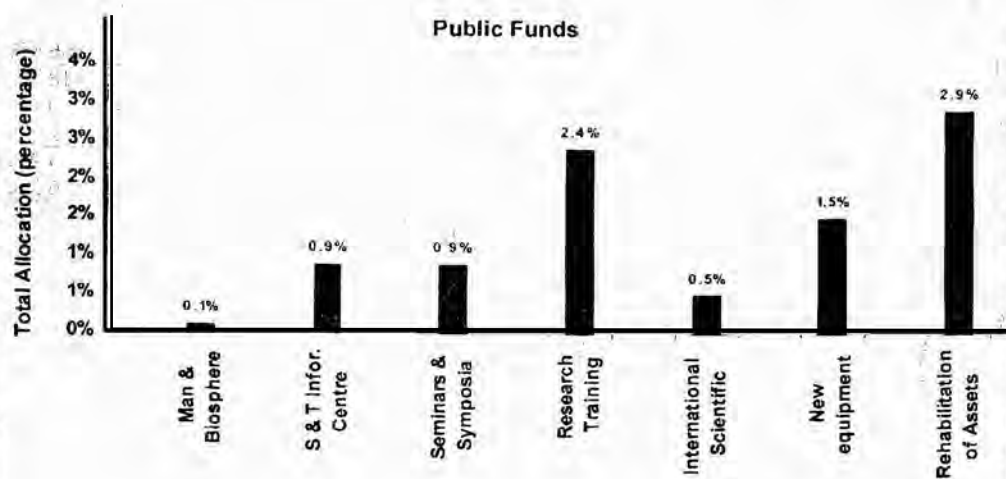
Government allocated Rs. 20,550 Mn for capital expenditure in year 2003. Rs. 12.8 Million was allocated by Sida (Sweden) for scientific work.

Public Funds (Allocated by the Treasury)

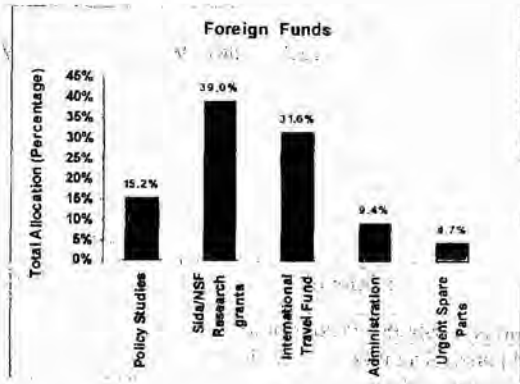


Rs. '000

Grants & Other Scientific Work	18625	91%
Man & Biosphere Programme	25	0.1%
Sri Lanka Scientific & Technical Information Centre	200	0.9%
Seminars & Symposia	200	0.9%
Research Training	500	2.4%
International Scientific work	100	0.5%
Office Furniture & Equipment	300	1.5%
Rehabilitation of Assets	600	2.9%
TOTAL	20,550	



Foreign Funds

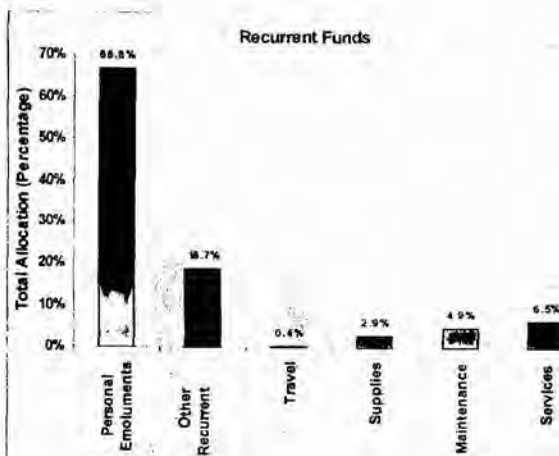


Rs. '000 -

Policy Studies	1,950	15.2%
Sida/NSF Research Grants	5,000	39%
International Travel Funds	4,050	31.7%
Administration	1,200	9.4%
Urgent Spare Parts	600	4.7%
TOTAL	12,800	

Recurrent Funds

Main contribution is by the government. Generated income which is around Rs. 1M-1.3M per year is mainly by the sale of publications, income received on external printing work and internet membership fees. For the year 2003 the Treasury Grant was Rs. 23M and the NSF income estimate by the Treasury was Rs. 1.6M. Subsequently 2% of the budgetary provision on recurrent expenditure on all votes other than on salaries & wages, & other allowances was frozen.



Original Allocation
Rs.'000

Personal Emolument	16,400	66.6%
Other Recurrent	4600	18.7%
Travel	100	0.4%
Supplies	700	2.9%
Maintenance	1,200	4.9%
Services	1,600	6.5%
TOTAL	24,600	

Sponsorship of Scientific Research

*** *Research Grants Scheme***

The award of research grants is one of the main activities of the NSF to promote scientific and technological research in the country.

Applications for research grants are invited through an advertisement in the national newspapers. Applications received by the NSF are initially reviewed by the Secretariat for conformity with the guidelines. Those that meet the application criteria are subjected to a technical review process by the relevant NSF Research Committee/s. The Research Committees are made up of eminent scientists drawn from universities and public/private sector institutions.

Research grants thus awarded are monitored through half-yearly progress reports. Progress review seminars are also held and grantees make presentations based on the work carried out under the project annually in addition to the progress reports. This is a forum for discussion and clarification of problems faced by grantees effectively. Research Committee members also visit the project sites with a view to ascertain the work carried out by the grantees.

A comprehensive final report is submitted by the grantees on the completion of a Research Project which is evaluated by a specialist appointed by the Research Committee. The evaluation takes into account the intrinsic scientific contributions made towards widening the horizons of knowledge and/or application of science and technology for development, and also any postgraduate degrees awarded to personnel associated with the project.

*** *Scholarships and Fellowships***

A Scheme for Scholarships and Fellowships for 2004 was initiated in 2003. The Scholarships were meant for outstanding science graduates/engineers for full time research leading to M.Phil and Ph.D degrees for 2-3 years with a stipend of Rs 12000/- per month and research expenses of RS 50,000/- per year. Fourteen applications were received for consideration by the NSF and three scholarships were awarded.

There were no successful applications for Fellowships in 2003. This Scheme was meant to support outstanding post doctoral scientists/engineers to undertake full time research with a stipend in accordance with university salary scales, and research expenses of Rs 100000/- per year. This was also applicable to persons in the private sector undertaking research in state institutions, university staff on sabbatical leave in the private sector and scientists/engineers returned recently from abroad. This programme will be linked to the Industry-Institute Partnership Programme which is currently functioning under the ADB, Science and Technology Personnel Development Project.

Summary of information on the Research Grants Scheme for the year 2003 is given below. Details of grants awarded in year 2003 are given in the annexes.

Grants awarded in 2003	-	37
Amount allocated for new grants for the first year (2003)	-	Rs. 12,654,636
On going grants as at 31.12.2003	-	129
Grants Completed	-	42
NSF Scholarships awarded in 2003	-	03
Research Students appointed	-	21
No. of Research Students registered for postgraduate degrees	-	15
No. of publications & communications	-	61
Postgraduate theses received	-	09
	M. Phil	- 05
	MD	- 03
	M.Sc.	- 01

Significant Research Findings

- **Species/strain identification of *Leishmania* parasites causing cutaneous leishmaniasis in Sri Lanka**

Cutaneous leishmaniasis (CL) is still not widely recognized as an endemic disease in Sri Lanka in spite of numerous reports from many parts of the country. A notable increase of CL during the recent past led to this study with the primary objective of identifying the causative *Leishmania* species and secondarily to carry out an awareness program to enable early diagnosis. Patients referred from the Dermatology units at General Hospitals Colombo, Anuradhapura and military camps in and around Anuradhapura, with lesions suggestive of CL were included in the study. A detailed history and clinical examination were done on all patients. Diagnosis confirmed by examination of Giemsa-stained lesion smears. Culture media were inoculated and maintained at 25°C (in an air-conditioned room or inside a water-filled clay device).

The results indicated that Cutaneous leishmaniasis is an established disease in Sri Lanka, especially in the North-Central province. Out door occupational behaviors, close proximity jungles and lack of awareness are associated risk factors. Cryo therapy, the principle method of treatment used, has low compliance and limited effect on early parasite clearance. Three types of lesions seen: single/multiple dry ulcers, single, scaling nodules and non-tender, non-itching, erythematous papules, some had satellite lesions. Seven parasite isolates, corresponding to six patients, were typed. They were all *Leishmania donovani* of the zymodeme MON-37. *L. donovani* belonging to the zymodeme MON-37, was identified as the causative organism of CL in Sri Lanka. The rare demonstration of dermatotropism of *L. donovani* emphasizes the possibility of a genetic susceptibility of certain individuals that requires genetic-epidemiological study. The successful maintenance of *Leishmania* cultures at temperatures around 25°C with the use of a water-filled clay device [Patent no: 12887, National Intellectual Property Office of Sri Lanka], would be useful in situations where constant temperature incubators or air-conditioners are not available. This finding would be of particular interest to scientists in developing countries who work with limited resources.

(Dr. Nadira Karunaweera, Dr. Yamuna Siriwardane, Grant No: RG/SIDA/2002/M/01)

- **Synthesis of potential perfumery and flavour components from furfural**

As an agricultural country without petrochemical reserves, industrial utilizations of renewable biomass is an important area of research in Sri Lanka. Sri Lanka produces approximately 5×10^5 metric tons of rice hull annually. Rice hull is a convenient source of furfural (~12%). Furfural has expanding fields of applications including that of a starting material for organic synthesis. A limited number of examples of the use of furfural of synthesis two groups of compounds γ -substituted γ lactones and cyclopentenones both of which are of importance as fragrance and flavour compounds have been reported the objectives of the project were to explore some synthesis pathways, starting from furfural, to novel γ -substituted γ -lactones, in which there is a functionality in the γ -substituted side chain, with a view to develop new perfumery and flavour compounds,

Adequate yields of 4,7-dioxocarboxylic acids were obtained by a single phase modified Birch method even though the extension of two phase system developed for the hydrolytic ring cleavage of furfurylidene acetone to longer chain furfurylidene ketones was not successful. The overall strategy of reductive cyclization of 4,7-dicarboxylic acids to 7-hydroxyl γ -lactones and further modification of the 7-hydroxy group was successful. None of the new compounds synthesized showed strong olfactory properties. However, it was observed that vials containing the purified hydroxyl and oxo lactones attracted ants in the laboratory. Some lactones are known in nature to be insect pheromones. The hydroxyl and oxo lactones, thus may have potential uses as

insect attractants. The work carried out under this grant has provided a base to continue with the work on the utilization of furfural, in the chemistry department of the University of Sri Jayawardenepura.

(Prof. A.M. Abeysekera, Grant No: RG/98/C/04)

- **Investigation of Biochemical changes following post harvest treatment of banana with fungicidal essential oils**

The objective of this study was to determine the effect of essential oils of cinnamon and clove in controlling post harvest fungal pathogens and browning of banana as an alternative for synthetic chemicals and to develop a safer post harvest treatment system to prolong the storage life of banana.

Results of this study revealed that the essential oils of cinnamon bark, leaf and clove inhibit the anthracnose and crown rot causing fungi. Out of these, cinnamon bark and leaf oil were found to be the most effective.

Storage life of embul banana was lengthened up to 14 and 21 days in modified atmosphere together with essential oil treatment at ambient temperature and at 14°C respectively with a significant reduction of disease severity.

A patent was applied for this method to lengthen the storage life of banana using essential oil spray treatments together with modified atmosphere packaging at 28°C ± 2°C and 14°C.

(Dr Bimali Jayawardene, Dr Krishanthi Abeywickrama, Univ. of Kelaniya, Grant No : RG/2000/C/02)

- **Ecological investigation of the Macro-and Micro-Habitat selection of Small Mammals in Sinharaja.**

As concern over the rapid destruction of tropical rainforests and threats to their rich biodiversity mounts, many studies have reported that endemic species are facing higher rates of extinction than widespread, non-endemic species. The broad aim of this project was to investigate the effects of anthropogenic disturbance on the survival of the endemic and non-endemic small mammal fauna inhabiting the rainforests of Sri Lanka. This study specifically attempted to determine whether the endemics and non-endemics differ in their vulnerability to habitat destruction and alteration and, if so, to identify the underlying cause (s) of this disparity.

Surveys of small mammals were conducted across a disturbance gradient in the Sinharaja Man and Biosphere Reserve. These surveys revealed that the endemic species richness of the endemics decreased dramatically as the magnitude of forest disturbance increased while the species richness of the non-endemics was nearly constant across both forest and non-forest habitat types.

Two hypotheses were used to explain the observed differences in distributions. Hypothesis one proposed that non-endemics are able to tolerate wider habitat conditions than endemic species, hence their ability to occupy wider habitat ranges and withstand habitat disturbance. Hypothesis two suggested that the differences in distribution patterns are mediated by interspecific competition. These two hypotheses were tested using a pair of murids one of which was an endemic (*Srilankamys ohienensis* and *Mus mayori*) and the other a non-endemic (*Rattus rattus* and *Mus cervicolor*).

Detailed investigations were conducted into the ecology and behaviour of the selected murids, involving arrange of methodologies, both in the field (including radio-tracking) and under captive conditions. The restricted distribution of the endemics in general and the significantly larger home range size of the endemic rat

Srilankamys ohiensis compared to the two subspecies of the non-endemic *Rattus rattus* in the same locality, and its greater microhabitat selectivity and lower diet tolerance, suggest that endemics exhibit greater macrohabitat and microhabitat specialization than non-endemics, providing evidence in support of the first hypothesis. The patterns of occurrence of *Srilankamys ohiensis* and *Rattus r. kandianus* and the significant negative correlation between these two species in forest habitats suggest that one species is competitively excluding the other species from shared sites. The captive experiments confirmed the existence of competition and showed that the non-endemic *R.r.kandianus* was competitively superior to the endemic *S.ohiensis*, thus supporting the second hypothesis.

These findings indicate that, because endemics are more ecologically specialized than non-endemic species, the impact of habitat loss and modification on these species will be more severe than on the non-endemics that are usually habitat generalists. Furthermore, the adverse impact on the endemics can be further aggravated if forest disturbance facilitates the invasion of non-endemic species, especially if they are of the same general morphology and body size, as was the case with the rat species in this study.

(Prof. W D Ratnasooriya, Dr M. R. Wijesinghe, Grant No: RG/99/B/2)

• **Bioactive natural products from Sri Lankan lichens: Culturing of the mycobiont in the laboratory**

This study focused on the isolation of bioactive compounds from four lichen species collected in Sri Lanka: *Usnea* sp., *Heterodermia diademata*, *Rocella montagnei* and *Leproloma sipmanianum*. Bioassays used in this study are the antifungal assay against *Cladosporium cladosporioides* and the mosquito larvicidal assay against the 2nd instar larvae of *Aedes aegypti*. Approximately 50 lichen species collected mostly from the montane region were subjected to the above bioassays.

From the CH₂Cl₂ extract of an *Usnea* sp. collected from Ambewela, three compounds, namely, Ambewelamide A, Ambewelamide B and Usnic acid were separated. Ambewelamide A and B are new members of a family of highly modified dithiadiketopiperazines and constitute the first examples of this family of compounds isolated from a lichen. Ambewelamide A was found to possess potent *in vitro* cytotoxicity and significant *in vitro* antineoplastic activity. The MeOH extract of the same lichen furnished two new depsidone lactones and β -sitosterol. The MeOH extract showed moderate mosquito larvicidal activity. (+) Usnic acid showed mosquito larvicidal activity against larvae of *A. aegypti*, antifungal activity for the five fungi (*Cladosporium cladosporioides*, *Colletotrichum musae*, *Colletotrichum gloeosporioides*, *Curvularia trifolii* and *Monacrosporium ambrosium*) and also antitermite activity against *Glyptotermes dilatatus*. In a spore – germination assay, (+) Usnic acid inhibited the germination of *C. musae*.

Seven compounds were isolated from *R. montagnei* lichen. The MeOH extract yielded methylorsellinate, erythrin, erythritol rocellic acid, β -sitosterol, β -carotene and atranorin. The CH₂Cl₂ extract yielded aspicillin. Erythrin showed reasonable activity against *C. gloeosporioides* and moderate activity against *C. musae*, *C. cladosporioides*, *C. trifolii* and *M. ambrosium*. Compared to erythrin, its biosynthetic precursor methylorsellinate showed significantly higher antifungal activity against the same test fungi as given above. The antifungal activity of methylorsellinate was confirmed by a spore germination assay, using *C. musae*. The antifungal activity of rocellic acid was moderate compared to Benlate against the fungi *G.gleosporioides* and *M. ambrosium* using the TLC bioassay technique. β -carotene showed moderate mosquito larvicidal activity and low antifungal activity against *M. ambrosium*.

H. diademata furnished 5 compounds. 5-chloro-3-formyl-4-hydroxy-2-methoxy-6-methylbenzoic acid has not been reported before. Atranorin exhibited moderate mosquitolarvicidal activity but showed fungicidal activity comparable to the standard fungicide, Benlate. Atranorin showed moderate mosquito larvicidal activity against *A. aegypti*. In the antifungal assay, (TLC bioassay), this compound showed activity comparable to Benlate.

Atratorin showed much higher activity than Benlate against *C. gleosporioides* and *C. musae*, lower activity than Benlate against *C. cladosporioides*, *C. trifolii* and *M. ambrosium*. Atratorin inhibited the germination of conidia of *C. gleosporioides* up to 41.8%. Spore germination inhibition percentage for *C. musae* was 73.6%. These values corroborate the TLC bioassay results.

L. sipmanianum specimens were collected in the upland area of Nuwara Eliya on proterozoic rocks of gneiss and quartz around Beragala. This is the first report of the lichen from the Asian region. The butterfly *Talicauda nyseus nyseus* was found to be closely associated with *L. sipmanianum*. The presence of lichen substances in the adult *T. n. nyseus* indicates that their larvae feed on *L. sipmanianum*. There are no previous reports of the butterfly family (Lycaenidae) feeding on lichens.

From Ramboda in Nuwara Eliya district, a new lichen species growing on proterozoic rocks of gneiss and quartz was discovered. This species has been named as *Lepraria atrotomentosa*.

(Prof. Veranja Karunaratne, Prof. N.K.B. Adikaram, RG/96/C/04)

Meetings, Seminars and Workshops

A number of meetings, seminars, workshops and conferences were organized by the NSF during the year 2003 in order to initiate interaction among scientists, researchers and policy makers. These fora were meant to enable them to share experiences, update knowledge and at the same time pave the way for the NSF to emerge as a very strong platform for development of scientific dialogue and a channel for efficient dissemination of science and technology information.

* *Progress Review Seminars*

As part of the monitoring process of research projects, NSF held several Progress Review Seminars to evaluate the progress of ongoing projects in different disciplines. The Research Committee members of the relevant fields, grantees and invited scientists participated in them. The expert comments of eminent scientists are much valued in conducting research work more efficiently and effectively. The details of the Progress Review Seminars held during year 2003 are given below.

Date	Research Committee
07 th March	Food Science
13 th March	Social Science
13 th August	Agriculture
31 st October	Botany & Microbiology

* *Theme Seminars, Workshops, Conferences*

Date	Theme	Research Committee
07 th January	Utilization of genome data for the development of new diagnostics, therapeutics and vaccines	Biotechnology
27 th February	A workshop to adopt the proposed guidelines for the safe use of rDNA technology in the laboratory	Biotechnology
07 th March	Challenges and opportunities in forestry for the new millennium	Forestry
21 st March	Development of protocols for clinical trials of Ayurvedic drugs	Traditional Medicine
25 th – 26 th March	Potential contribution of Social Sciences to development	Social Science
26 th March	Identifying priority research areas in virology for solving health problems	NSF
06 th June	Effective proposal writing, conducting, and publishing academic research	Forestry
26 th June	Protocols for clinical trials on ayurvedic antidiabetic drugs	Traditional Medicine
04 th July	Computer assisted learning	Science Education
22 nd August	Scientific writing for young scientists in the field of Agriculture	Agriculture

04 th – 05 th September	Workshop on Ecotourism	Forestry
26 th September	Alternatives to river sand	Geology & Mineral Resources
28 th – 30 th October	Advanced training workshop in Social Science Research methodology for young social scientists	Social Science
02 nd December	Awareness workshop on GMOs/GMFs and biosafety for scientists	Biotechnology
19 th December	Prevention of heart diseases	Traditional Medicine

NSF/SLAAS Science Forum

★ NSF/SLAAS Science Forum

The NSF initiated a regular series of monthly public seminars in June 2002, in collaboration with the SLAAS. These public seminars are arranged for scientists who are recipients of travel grants from the NSF and the Commonwealth Science Council to share the knowledge and experience gained from their participation in International Seminars/Conferences/Workshops with the rest of the scientific community who did not obtain the opportunity to attend such events. 12 seminars were held alternatively at the NSF and SLAAS and 23 scientists made presentations at these seminars during the period of January – December 2003. The details are given below.

Date	Title	Resource Person
2 January 2003	Knowledge and attitude towards HIV/AIDS among media personnel for the first time in Sri Lanka	Dr S Samarakoon
	Report on the 6 th International Congress on AIDS in Asia and the Pacific	Dr K Buddhakorala
5 February 2003	Domestic roof water harvesting - experience from other countries	Mr R. D. S. Ariyabandu
6 March 2003	Teaching science and school based assessment in sixth grade class rooms	Dr S. Karunaratne
	Some concerns about lane discipline: Sri Lankan experience	Dr K. S. Weerasekera
3 April 2003	Anti-oxidant and analgesic activities of <i>Piper betle</i>	Dr L. S. R. Arambewela
	Mosquitocidal compounds from plant essential oils	Dr R. Samarasekera
8 May 2003	Ecosystem concept in soil fertility research	Prof. A. N. Jayakody
	Report on the 3 rd International Conference on landslides, slope stability & safety of infrastructure	Dr S. A. S. Kulathilaka
5 June 2003	Developments in breakwater design	Prof. S. S. L. Hettiarachchi
	Tools of national ocean policy	Mr H. B. Jayasiri
3 July 2003	Novel strategies in controlling plant diseases	Dr K. Abeywickrama
	New trends in post harvest disease control	Dr D. Sivakumar
7 August 2003	Anti-hypertensive effect of <i>Biophytum sensitivum</i>	Dr M. H. A. Tissera

4 September 2003	Analytical methods for nutrient analysis in water	Ms. S. Wickramaratne
2 October 2003	NMR study on polymers	Dr P. Ekanayake
	Processability studies of white rice husk ash (WRHA) Filled ethylene-propylene diene terpolymer (EPDM)/polypropylene (PP) thermoplastic elastomers	Dr S. Siriwardena
6 November 2003	Critical values of physiological and management factors affecting conception rate of water buffalo	Prof. E. R. K. Perera
	Report on the 4 th Asian Buffalo Congress for food security and rural employment	Dr U. K. I. Ariyaratne
4 December 2003	Potato production storage and seed technology	Ms. M. K. T. K. Amarasinghe
	Plant breeding and biotechnology for sustainable agriculture development	Mr. M.A.B. Ranatunga

Awards for Scientific Excellence- 2003

Merit Awards for Scientific Research – 2003

This scheme of awards was initiated in order to bestow on researchers who have attained a high level of excellence in their research work, the recognition they deserve for their contribution to the advancement of science. These awards are also meant to motivate recipients of research grants from NSF to achieve and maintain high standards of scientific research.

Those eligible for the NSF merit award in 2003, were the recipients of NSF research grants who have completed their projects during 2001 and 2002 and submitted comprehensive final reports. Selections were made by the relevant Research Committees and final recommendations were made by the Chairpersons Committee. Selections were made based on the outstanding contribution to advancing knowledge or the development of new processes and technologies.

One project was recommended for the Merit Award while four projects were recommended for certificates of commendation. As per the current NSF criteria, the project recommended for the merit award was being reviewed by foreign experts, at the end of 2003. The synopsis of this project is given in page 9 under Significant Research Findings.

Third World Academy of Sciences(TWAS)/NSF Prize for Young Scientists

The Third World Academy of Sciences (TWAS) gives recognition and support to young, talented scientists in developing countries to promote their research activities for the benefit of their country.

TWAS provides financial assistance to national science academies, Scientific Research Councils, Ministries of Science and Technology and high level research organizations in a number of developing countries to enable them to institute a scheme of TWAS prizes for young scientists.



Under this programme the NSF has instituted a scheme for the annual award of prizes for talented young scientists who have attained a high level of excellence in research work in the fields of Biology, Chemistry, Mathematics and Physics. Each award consists of a cash prize of the equivalent of US \$ 500 granted by the TWAS and a certificate. The prizes are intended to provide an incentive to talented young scientists to attain high levels of excellence in their research work and to reward such attainments.

The following scientists received the awards for years 2000 and 2001 at a ceremony held at the NSF on 08th May 2003. Hon. Keheliya Rambukwella, Minister of Science and Technology gave away the Awards.

Year 2000

Biology

Dr.(Ms) Maya B. Gunasekera, Department of Chemistry, University of Colombo

Physics

Dr. C.A.N. Fernando, Department of Physics, University of Ruhuna

Year 2001- Chemistry

Dr. D.P. Dissanayake, Department of Chemistry, University of Colombo

Publications



Journal of the National Science Foundation

JNSF Vol. 31 Nos. 1 & 2 March & June 2003 special issue

Proceedings of the Regional Meeting of the South and Central Asian Man and the Biosphere Meeting of Experts on Environmental Conservation, Management and Research was published as a special issue of the Journal of the National Science Foundation



Vidya Quarterly Newsletter

Volume 5, No. 1- January 2003

Volume 5, No. 2- April 2003

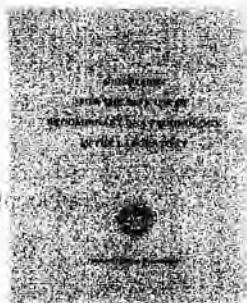
Volume 5, No. 3- July 2003

Volume 5, No. 4- October 2003



Sri Lanka Journal of Social Sciences

Work on the combined issue of Vol 25 (No. 1&2) and Vol. 26 (No. 1 & 2) was completed.



Special Publication

Guidelines for the Safe use of Recombinant DNA Technology in the laboratory.

International Scientific Activities

*** Sida/SAREC Programme**

NSF signed an Agreement with Sida for a grant of SEK 3 million for the period 2003 – 2007 for international travel grants, research grants, and research policy training/studies.

• International Contacts Fund

Sri Lankan scientists are supported by International Contacts Fund of the NSF to attend International Conferences/Seminars/Workshops. Applications for travel grants are considered six times a year. During the year 2003, 121 applications were received and 74 travel grants were approved, of which, 62% grantees were from Universities and rest from other Institutions. 51% grantees were below age of 40 years. 30% of the travel grant recipients were females.

• Sida/NSF Research Grants

Seven research grants in the discipline of social sciences and one research grant in Zoology were awarded in year 2003. (Details in annex)

• R & D Policy/S&T indicators

- Report on the National Survey of R & D in Sri Lanka was finalised.
- A study on the role of public policy in linking university and research centres with industry in Sri Lanka was continued.
- A study on the impact of policy issues on technological innovations in rice production in the agriculture sector of Sri Lanka was concluded.
- The project on productivity and impact assessment of natural products chemistry research in Sri Lanka was continued.

*** Commonwealth Science Council**

• Travel Grants Scheme :

The purpose of this travel grants scheme is to help scientists of member countries of the CSC to attend international conferences, major meetings and short technical in – service training courses. Grants cover the actual costs of the return airfare and registration fees up to a total of £ 1000.

12 applications were received to be considered by the NSF. Nine applications were endorsed by the NSF and the CSC awarded 04 travel grants to Sri Lankan scientists during the year 2003.

- Fellowships Scheme :

This fellowship scheme provides opportunities for scientists from member Commonwealth developing countries, to enhance their professional skills and experience through short term attachments in other commonwealth countries.

Three applications were received and two were endorsed by the NSF during the year 2003. The CSC awarded one fellowship.

- Workshops :

Information on the following workshop (fully sponsored by the CSC) were circulated to relevant institutions and nominations were forwarded to the CSC. One participant from Sri Lanka was fully sponsored by CSC.

- Training the Trainers on Nutrients in the Environment of the Asia-Pacific Region, 22-25 April 2003 Brisbane, Australia

However, the CSC was closed down by the Commonwealth Heads of Government at their meeting in Abuja, Nigeria in December 2003.

* UNESCO

- **National Man and Biosphere Committee**

- *Nomination of the Bundala National Park as an International Biosphere Reserve*

The Man and the Biosphere (MAB) Committee recommended that the Bundala National Park be nominated as an International Biosphere Reserve. The task of the completion of the nomination form was entrusted to the Department of Wildlife Conservation with Mr H.D. Ratnayake, Deputy Director (Research & Training) as the Principal Investigator and a team of scientists working to obtain information required for this. The Department of Wildlife Conservation undertook this study with assistance from the NSF, other relevant governmental, nongovernmental authorities and the local communities with financial assistance from UNESCO. The completed nomination form would be submitted to UNESCO in 2004.

- *Review of the Sinharaja Biosphere Reserve*

On the recommendation of the National Man and the Biosphere Committee and the Forestry Committee of the NSF, Dr Jinie Dela was assigned the task of carrying out the review of Sinharaja Biosphere Reserve. This was done in collaboration with the Department of Forestry and other relevant authorities with financial support from UNESCO.

The draft report was reviewed by the National MAB Committee and the final report was submitted to UNESCO in December 2003.

- *National Bioethics Committee*

A proposal was made to the NSF by Sri Lanka UNESCO National Commission to function as the focal point for liaising with the International Bioethics Committee of the UNESCO. Consequently, the NSF formed a National Bioethics Committee to serve this purpose. The mandates of this Committee are :

- o To ensure publicizing UNESCO and other international declaration on Bioethics
- o To liaise with IBC of UNESCO
- o To formulate guidelines for emerging issues in Bioethics relating to scientific research on humans
- o To network with different Institutional Bioethics Committees in Sri Lanka
- o To do all that is necessary to promote concerns for humans for human rights, dignity and fundamental freedom in the context of scientific research

The following recommendations made by the Bioethics Committee were sent to the relevant authorities for necessary action:

- o To teach relevant aspects of bioethics in universities
- o To establish Animal Ethics Committees in universities and research institutions
- o To establish an authority by an Act of Parliament to regulate the applications of Assisted Reproductive Technologies in Sri Lanka.

A workshop to publicize the International Declaration on Human Genetic Data was held on May 27, 2003. Comments made by the participants on the revised outline of the Declaration were sent to the UNESCO.

* **International Foundation for Science**

The NSF is a member organisation of the International Foundation for Science, which is an international non-governmental organisation based in Sweden. The IFS supports young scientists in developing countries in their research efforts in the agricultural and biological sciences as well as in management, conservation and sustainable use of natural resources.

Dr Maya B Gunasekera was awarded the IFS Jubilee Award – 2003 for the valuable contribution she had made to the scientific knowledge on the genome of the Sri Lankan elephant. This Award is given for noteworthy achievements made by IFS grantees.

* **International Council for Science (ICSU)**

ICSU is a non-governmental organization which is mandated to promote international scientific activities in the different branches of science and their application for the benefit of humanity.

The NSF adopted the principles on universality of science and freedom of the pursuit of science enunciated by ICSU.

Universality of science: the freedom of scientists as individuals to communicate and associate with other scientists, in the furtherance of their science without discrimination on grounds other than scientific merits through international scientific activity.

Freedom in the pursuit of science: the right of scientists to freely pursue science in a manner which accords with the scientific process and is undertaken responsibly.

The NSF has expressed interest to host the proposed ICSU regional Office for Asia.

* **International Centre for Genetic Engineering & Biotechnology (ICGEB)**

- Four participants attended the ICGEB seminars, workshops and short training courses.
- Four applications were endorsed and forwarded to the ICGEB for consideration under the postdoctoral fellowship programme (three applications for the first review and one for the second review). One post-doctoral fellowship was awarded to Sri Lanka at this review.

- ICGEB Board of Governors meeting was held in Trieste, Italy from 10-12 November. Prof. Ranjan Ramasamy, the Governor for Sri Lanka, attended this meeting.
- Two project proposals were endorsed and forwarded for consideration under the collaborative research programme.

✱ **Asian Association of Social Science Research Councils (AASSREC)**

- The 15th Biennial Conference of the Asian Association of Social Science Research Councils held in Canberra Australia from 10th to 15th November, 2003 was attended by Professors(Mrs) Chandra Gunawardane, Chairperson and S.T. Hettige, member of the Social Science Research Committee presenting the paper for the Special Panel Discussion and the Country paper, respectively.
- The NSF continued to function as the national focal point for AASSREC and coordinated its activities with the Sri Lankan Social Scientists. Its connections with this body and related organizations led to the Organization being associated with the visits of two eminent social scientists from abroad, during the year.

✱ **SAARC Activities**

The following activities were undertaken as per the decisions taken at the Second Meeting of the SAARC Technical Committee on Science & Technology.

- A project proposal outline titled "Edible vaccines for malaria, tuberculosis, dengue and asthma" were sent to the SAARC Secretariat requesting inputs from Member States for the development of a complete project proposal for implementation.
 - Sri Lanka as the coordinator of the project on aquaculture proposed an activity plan on the project for consideration at the next SAARC Technical Committee Meeting on Science & Technology. Proposed activity plan was forwarded to the SAARC Secretariat.
 - Nominations (2) were forwarded to the SAARC Secretariat for the following SAARC training course: Training Course on Bioassays and Pharmacological Techniques for Drug Development, Karachchi, 10-15 October 2003.
 - Comments on the concept paper on "Formulation of Biosafety and bioethics guideline priorities for the SAARC region were forwarded to the SAARC Secretariat.
- ✱ Professor P.V.B. Karunatilaka, Member of the Social Science Research Committee and Ven. Dr. Wijithapura Wimala of the Department of Economics, University of Colombo were nominated to The Seminar on "SAARC: Partners in Peace and Progress – funded by the Indian Social Science Research Council from the 27-28 August in New Delhi, India and they participated and presented papers on the themes assigned to them.

✱ **Programme of Cooperation on Science & Technology between India & Sri Lanka**

As a follow up of the fifth session of the India – Sri Lanka Joint Commission that took place in Colombo on October 15, 2003 the NSF has taken steps to be the Nodal point of this programme and handle Science & Technology development matters. Accordingly, action has been taken to implement research and other proposals under this programme.

Manpower Information Systems (MIS) Unit

Manpower Information System (MIS) Unit is being funded under the S&T Personnel Development Project (STPDP) of the ADB Project handled by the Ministry for Economic Reform, Science and Technology. Activities of the MIS unit were continued and few other activities were initiated during 2003, for the development of a comprehensive tool to generate information on a regular basis, on the S&T personnel and resources available in the country.

- *S&T manpower and related studies*

The final report on 'Tracer Study of S&T graduates passed out from the Sri Lankan universities in 2000/2001' was submitted to the STPD Project. This study provided an insight to the demand for fresh graduates in various S&T disciplines. Two newspaper articles based on this study (Employment of science, engineering and agriculture graduates of 2000/2001) and on previous studies (Science graduates and the labour market) were published in the NSF Science Page of the Daily News.

Another study initiated on similar lines relevant to " S&T graduates passed out from the Sri Lankan Universities in 2002 " was commenced and continued during the year.

- *Data base on S&T Manpower Information System*

A computer based information system and data collection tool were developed and data received from the universities and R&D institutes on S&T personnel, were entered into the data base on regular basis. STMIS data base developed by the MIS Unit was installed in the universities (University of Jaffna, Rajarata University, and Post Graduate Institute of Agriculture) and R&D institutes (Veterinary Research Institute, Rice Research and Development Institute, Institute of Post Harvest Technology, Sugarcane Research Institute, and Institute of Fundamental Studies).

A web site on STMIS was also developed.

- *Other activities*

The ADB Project Mission visited the NSF on 17 August 2003. A presentation on the work programme of the MIS Unit was made by the Project Manager.

A seminar on "Tracer study of S&T graduates passed out in 2000/2001 from the Sri Lankan universities" was held on 10 November 2003 at the NSF to mark the ' World Science Day '. A comprehensive presentation on the tracer study was made by the Project Manager, and this was followed by a panel discussion. University lecturers, scientists, undergraduate students and media personnel etc., attended the seminar.

Two presentations on similar lines were made by the Project Manager on 02 December 2003 at the IPCU Coordinator's meeting held at the STPD Project Office and on 10 December 2003 at the PIU meeting held at the University of Moratuwa.

Technology Watch Centre

The Centre for Technology Watch continued with activities for the development of the industry in Sri Lanka. The Centre is funded under the S&T Personnel Development Project of the Ministry for Economic Reform, Science & Technology.

- During the year 2003 the TWC expanded its activities into all ten thrust areas identified by the S&T PD Project. Consequently the TWC now covers Aquaculture Technology, Food Science and Technology, Polymer Science & Technology, Electronics and Telecommunication, Biotechnology, Environmental Science and Technology, Management of Technology, Textile Technology, Information Technology, and Civil, Mechanical & Manufacturing Engineering.
- The TWC has further developed its Databases on Technology Developers local and foreign, Experts/Consultants local and foreign, local industry, large, small and medium scale. Most of the databases can be accessed online.
- Three issues of TECHWATCH LANKA, the TWC newsletter containing information on latest technological developments in Sri Lanka and overseas have been circulated among industries, related associations, R&D institutes and relevant libraries.
- Four newspaper articles were published in the *Daily News*.
- Initial steps were taken to establish links with Sri Lankan Scientists, Expatriates with a view to soliciting their assistance for the TWC activities.
- Steps were taken to forge links with foreign technology developers through foreign missions in Sri Lanka.
- A survey was carried out in order to assess the technology status in the Sri Lankan Plastics industry.
- Three industry oriented workshops (Renewable energy technologies, Aquatic ornamental plant industry, and Fish processing industry) were organized in order to identify and deliver solutions to emerging problems of the industry, and follow up action pertaining to these three seminar was carried out.
- Four brochures were prepared on current topics of interest (Test kits for food processing industry, Waste tire disposal methods, Good practices latex processing, Manual for Latex protein allergy problems). These were made available to the relevant industries.
- Hand book on Noise Pollution and Control Techniques for the local industry was edited.
- Hand book on Simple identification methods of some selected Aquatic Ornamental plants was edited.



Public Understanding of Science

The NSF initiated to publish scientific articles of current interest, in the newspapers, namely Daily News, Dinamina and Thinakaran on a weekly basis as 'science page' with the objective of disseminating information on science and technology in Sri Lanka. The science page contains three components, the local trends, global focus and the NSF calendar. This mechanism has envisaged wide dissemination of new knowledge and information mainly focusing on biotechnology, biology, medicine/ health, agriculture, chemical sciences and physical sciences. Most of the time, the source of information had been the experts and researchers in the relevant fields. This process was continued throughout the year successfully motivating the readership including scientists, students and especially the general public.

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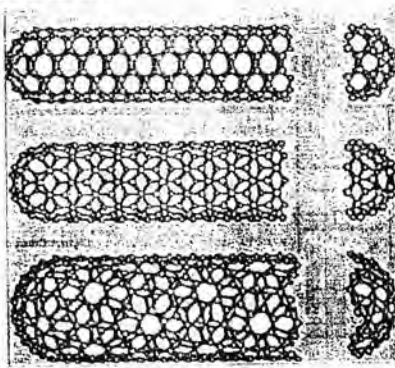
THE WORLD OF SCIENCE

Nanotechnology and Carbon Nanotubes

Local Trends

Modern science and technology have opened up the world around us. In fact, the components of our world are made up of building blocks. The function, characteristics and properties of the carbon components depend critically on the arrangement of the atoms. The one hand, the same C-H-N-O can form proteins and double helix structures to give DNA the basic building block of life. The very same atoms combine to form many other substances, such as polymers, plastics and diamonds.

Carbon nanotubes are cylindrical structures of carbon atoms. They are made of rolled-up sheets of carbon atoms. The structure of the carbon atoms is very important. The arrangement of the atoms and molecules in a crystal lattice is called the crystal structure. The arrangement of atoms and molecules in a crystal lattice is called the crystal structure. The arrangement of atoms and molecules in a crystal lattice is called the crystal structure.



Different types of carbon nanotubes

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Until recently carbon nanotubes or nano structures were grown on a substrate, for which the substrate were held at very high temperatures in the range of 700 - 1100°C. This severely limited the scope of devices and structures that could be formed using carbon nanotubes.

GLOBAL FOCUS

Benefits and risks of Nanotechnology

Nanotechnology is the science of manipulating matter at the atomic and molecular level. It is the science of manipulating matter at the atomic and molecular level. It is the science of manipulating matter at the atomic and molecular level.

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NSF Calendar

NSF Graduate Buser Study 2002
The NSF Policy Research Division of the NSF is planning to conduct the next round of studies on graduates who have passed out in 2002 from the Faculties of Agriculture, Science and Engineering of all the universities in Sri Lanka. The first round of studies was conducted in 2000 with the support from the SETHUPET Project. The studies will be conducted in 2002 with the support from the SETHUPET Project. The studies will be conducted in 2002 with the support from the SETHUPET Project.

Launch of STMS Website / NSF
A Science and Technology Management Information System has been established at the NSF with funding from the Ministry of Economic Affairs. The system will be launched in 2002. The system will be launched in 2002. The system will be launched in 2002.

Study funded by ADF
The study reported in the article on 'Employment of science, engineering and agricultural graduates of 2000-2001' was funded by the ADF. The study reported in the article on 'Employment of science, engineering and agricultural graduates of 2000-2001' was funded by the ADF.

The details of articles published in the Daily News during 2003 are given below.

Local Trends	Global Focus
Science graduate and the labour market	Characteristics of S & E graduates in the US
Widening the scope of plant based medicines	Testing health claims of traditional medicines in India
Preserving the ozone layer	Arctic ozone damage a possibility
Controlling nutrients in water bodies	Ensuring ecologically superior waterways
Waste not wasted tyres	Giving scrap rubber commercial value
Taking a closer look at bio-pesticides	
Clamping down on marine invaders	MEPC reviews proposed draft on control of ballast water
Alternative strategies for managing plant diseases	Using a bacterium to create better crops
Computer assisted learning in science	IT to revolutionize British schools
Breaking new ground in banana cultivation	Banana may help prevent strokes
Cleaner air and healthier living	Traffic pollution – a cause of illness and death
The need for coast conservation and ocean governance	Creating a new ocean ethic
Proposed International declaration of human genetic data	The universal declaration on the human genome and human rights
Environmental hazards: how much are we responsible?	Soil loss threatens food prospects
Recognizing excellence in scientific research	TWAS to ensure that voices of third world scientists gain greater resonance do
Energy saving stove and healthier cooking	Domestic smoke: health impact of indoor pollution
The current status of the fish processing industry in Sri Lanka, challenges for global trade	New technology for the fish processing industry
Clinical trials of Ayurvedic drugs	Traditional medicine takes on the world
Priority areas for virology research in Sri Lanka	An overview on SARS
Medicinal and aromatic plants for human welfare	India to protect herbal remedies
Genomics reveal the many secrets of mosquitoes	50 years after the discovery of DNA's structure
Solar energy conversion devices	Aquarium turns solar energy into electricity
The forestry sector – new opportunities	Eco-tourism and forests Planting forests to soak up carbon
When every drop counts Collecting rain water before it hits the ground	Year 2003 – the international year of freshwater
Aids, the media and the experts	Limited success for AIDS vaccine Preventive aspects of STD and AIDS
Dramatization of teaching to popularize science among school children	Zeroing in on science education New science curriculum for Britain's schools
The aquatic ornamental plant industry – time for action The problems with shrimp	Allergen – free shrimp
The scope of renewable energy	UK's plans for greener energy through renewable power
Development of DNA markers for identification of individuals	Cloning humans: can it really be done? Gene 'atlas' could aid cancer research
Bridging the technological divide	Technological advancement for economic growth

Exploring the potential for eco-tourism in Sri Lanka	Reviewing past experiences and meeting future challenges
Increasing vegetable production promoting food security	Big yields for small farmers
Biotechnology in animal science	Biotechnology - presenting new challenges for regulators
Making optimal use of surplus rice	Rice is life
The science of space and light	China's mission to space Getting to know a comet
Placing a value on wetland conservation	Wetlands to protect against floods
NERD centre helping industries, help themselves	Nepalese study on industrial noise pollution and its impacts
Setting standards for quality	Assessing the reliability of industrial Machinery
Bio transformation of toxic waste into harmless substances	A 'super bug' capable of making waste less hazardous
Proper utilization of the water Buffalo in Sri Lanka	Animal recording – a prerequisite to develop buffalo production
Employment of Science, Engineering and Agriculture graduates of 2000/2001	First destination of science, engineering and IT graduates in UK
Nanotechnology and carbon nanotubes	Benefits and risks of nanotechnology
Dye sensitized solar cells – A promising renewable energy source for the future	Mobile solar energy

Other Activities

★ Intellectual Property Rights

- A patent was obtained for water-filled clay device for maintenance of *Leishmania* parasites.
Grant No. RG/2002/SIDA/M/01
- Two applications for patents were filed for the inventions titled below:
 - Pharmaceutical formulation containing *Nigella sativa*, *Hemidesmus indicus*, and *Smilax glabra* Plants"
Grant No. RG/2000/M/01
 - Method to lengthen the storage life of banana by controlling post harvest fungal rots using essential oils spray treatments together with modified atmosphere packaging at 28±2°C and 14°C.
Grant No. RG/2000/C/02

★ Participation at Exhibitions

NSF participated in the following exhibitions / events by running a stall which displayed models and posters pertaining to NSF funded projects and services rendered by the institute.

1. Workshop on Ornamental Aqua Plants held at the BMICH – February 2003.
2. Seminar on Challenges and Opportunities in Forestry for the New Millennium held at the BMICH – March 2003
3. Science and Technology Exhibition organized by the Ministry for Economic Reform, Science and Technology held in Gatambe – September, 2003.
4. Sri Lanka Foundation Institute Annual Convention – November, 2003.

★ Donations to school libraries

The following issues of Vidurava were distributed to 320 schools, during year 2003.

- Vol. 20 No. 02 - Mosquito Borne diseases (English Version)
- Vol. 21 No. 01 - Science Communication (English)
- Vol. 21 No. 01 - Vidya Sannivedanaya (Sinhala)

★ Undergraduate research competition

The NSF collaborated with the South Asia Institute of the University of Heidelberg, Germany, in organising an island-wide competition on "The Role of Religion in the Peace Process". Undergraduate students were invited to submit a case study on a particular incident in which a conflict occurred and point out how a religious institution, leader or concept contributed to the solution of this conflict. The competition was open to undergraduate students from any academic discipline.

Entries were received from the Universities of Colombo, Moratuwa, Jaffna, Horana Campus and Eastern University. The winning entries are given below.

Prize	Name	Affiliation	Research topic
1st	Jenneth M. Marker, Amal de Chickera, Dinesha Samararatne (Group entry)	University of Colombo, Faculty of Law	Sinhalese – Tamil riots in Kotagala etc. in sequence of the Bindunuwewa massacre, Oct 2000 and the joint initiative by local religious leaders
2nd	W. Dilini Madurangi	University of Colombo, Department of Political Science and Public Policy	Riots between Muslims and Buddhists on a land dispute in Maligawatte, Colombo, Oct 2000 and joint initiative by local religious leaders
3rd	W.A.P.M. Pallawela and K.M.J. Perera (Group entry)	University of Moratuwa, Faculty of Engineering	Two conflicts between Roman Catholics and Buddhists on the installation of religious statues in Wattala and Kadol Kale and Negombo in the late 1990's and solution by respected members of these religions in the neighbourhood with the mediation of a local justice of peace and the arrival of third party common enemy (Christian sector)

The prizes were awarded at a ceremony held at the SLFI on 18 November, at which the award winners presented their work.

Sri Lanka Scientific & Technical Information Centre (SLSTIC)

The SLSTIC continued to function as the focal point for the dissemination of Science and Technology information in Sri Lanka. Progress made to enhance the resource collection and improve the services rendered during year 2003 are briefly given below.

Collection development

No. of books added to the collection - 253

No. of Final Reports of NSF projects added to Reference collection - 49

No. of Annual Reports received (Local and Foreign) - 24

No. of periodical titles received - 72

(No. of titles on subscription - 8)

Database development

- The number of records added to each database was as follows.

Sri Lanka Science Index (SLSI) - 1511

Catalogue database (SLSTICAT) - 2356

Research Grants database (RGRA) - 49

Sri Lanka web directory (WEB) - 30

The number of records added to SLSI and SLSTICAT databases show a significant increase when compared to year 2002.

- The following databases were updated. Work is being continued.
 - Research Grants database (RGRA)
 - Union list of Periodicals (ULIST)
 - SLISTINET libraries (SLSTINSET)
- Following new databases were established
 - Research & Development Institutions in Sri Lanka
 - On-going S&T Research projects in Sri Lanka
- Full text of articles appearing on the Science Page of the Daily News and the corresponding articles appearing in the Sinhala and Tamil newspapers were scanned to be stored in CD-ROM media.
- The following databases were discontinued
 - Natural resources database
 - Newspaper articles index

Promotion of application of IT

- SLSTIC/NSF continued to function as the National distributor of CDS/ISIS library software developed by the UNESCO. During the year 2003, 23 copies of the software package (windows version 1.4) were distributed among institutions and individuals.
- Three workshops on Basic WINISIS (windows version of CDS/ISIS) were conducted during year 2003 (in March, October and November). The number of library personnel trained were 20. A survey was initiated to evaluate the effect of training librarians on the application of CDS/ISIS software.
- Assistance was provided continuously in trouble shooting in CDS/ISIS software
- A demonstration on Library Automation was made on 7th April which was attended by 66 Librarians and information professionals

Intranet/Internet activities

- 6 workstations in the network were upgraded.
- One new website was launched at the NSF server bringing the total number of sites to 16.

Staff Development and Training

The following Officers continued their postgraduate research programmes, during the year.

Name	Degree	Registered at
Mr W. Amaradasa	PhD	Univ. of Wollongong, Australia
Mr W. Anuruddha	MSc	Univ. of Colombo
Dr T.F. Dias	MBA	Univ. of Moratuwa
Dr S. Fernando	MSc	Univ. of Kelaniya
Ms A. Pitadeniya	MSc	Univ. of Peradeniya
Ms P. Warnasooriya	MBA	Univ. of Moratuwa
Ms S. I. Wickramasinghe	PhD	Jawaharlal Nehru University, India
Ms C.G. Yapa	PhD	Univ. of Colombo

The following Officers who had completed their post graduate research projects were engaged in writing up their dissertations.

Ms S.A.V. Moorthy	PhD	Univ. of Colombo
Ms S. Perera	PhD	Univ. of Colombo
Ms L. Wanasekera	PhD	Univ. of Colombo

★ Presentations at Local Scientific fora

• **SLAAS 2003**

• **Officer**

Title of Presentation

- | | | |
|------------------------|---|--|
| • Ms S.A.V. Moorthy | - | Immune responses in mice to oronasal immunisation of a malaria parasite antigen displayed on <i>Lactococcus</i> cell walls |
| • Ms. Lekha Wanasekera | - | Parasite-derived lipids as putative toxins in <i>Plasmodium vivax</i> malaria |
| • Ms. C.G. Yapa | - | Trends in research collaboration in the field of natural products chemistry in Sri Lanka |
| | - | A bibliometric study in natural products chemistry across an institutional landscape in Sri Lanka |

★ Awards and honours

The SLAAS Postgraduate Research Award was won by Ms S.A.V. Moorthy, Scientific Officer for her above work (Section A).

Seminars, Conferences, Meetings, Workshops attended by Staff

Mr. M. Watson, Director

09 – 12 June	21 st Meeting of the Commonwealth Science Council, Johannesburg
06-07 October	Consultative Meeting of the Asia Cooperation Dialogue on Biotechnology, New Delhi
25 November	Cabinet Subcommittee on Establishment matters, Parliament

Attended Meetings of :

- Board of Management of PGIS
- National Experts Committee on Biodiversity
- NASTEC Working Group on Factors Inimical to S & T

The staff members participated in the following events during the year 2003.

Date	Event	Officer participated
10 th January	Seminar on Financial Reporting	Ms C. Fernando
06 th – 08 th August	Asian Regional Training Course on Greenstone digital library software, Bangalore, India	Mr. J.S.K. Weerawardane
29 th September – 03 rd October	Workshop on "Productivity Measurement Indicators"	Mrs. R. Wijeratne
30 th September	9 th ERU Symposium : Research for Industry,	Ms S.A.V. Moorthy
10 th December	SLAAS Theme Seminar	Dr T. Dias Ms S.A.V. Moorthy Ms S. Perera Ms A. Pitadeniya Ms L. Wanasekera Ms R. Wijayaratna Ms G. Yapa
22 nd December	Budgeting & Financial Reporting of Statutory Boards	Ms C. Fernando Mr A.C.M. Daniel Ms Yamuna Pathirana
	Wildlife Sector Research Committee Meetings	Ms H.A.U. Amarasinghe

Board of Management

Prof. Ranjan Ramasamy
Chairman

Mr M Watson
Director of the Foundation

Prof. Uma Coomaraswamy
Vice Chancellor
Open University of Sri Lanka
Nawala, Nugegoda

Prof. Savitri Goonesekere
Professor of Law
University of Colombo
Colombo 03.

Prof. Anoja Fernando
Prof. of Pharmacology
University of Ruhuna
Wellamadama, Matara

Prof. Lalitha Mendis
(from 01.01.2003 to 05.04.2003)
Director PGIM
Kynsey Road
Colombo 08.

Eng. B R O Fernando
45A, Lady Evelyn de Soysa Road
Idama,
Moratuwa

Prof. J N O Fernando
Senior Professor
Open University
Nawala
Nugegoda

Prof. K D Arulpragasam
(from 01.01.2003 to 07.08.2003)
Vice Chairman
National Education Commission
223C, Narahenpita
Colombo 05.

Mrs N Madanayake
Director
Dept. of Public Finance
General Treasury
Colombo 01.

Audit and Management Committee

The following served as members of the Audit and Management Committee, appointed by the Board of Management.

Mrs N Madanayake (Chairperson)
Prof. J N O Fernando
Eng. B R O Fernando

Eight meetings of the Audit and Management Committee were held during the year 2003.

Staff Development Committee

Prof. K D Arulpragasam
Prof. Anoja Fernando
Prof. Savitri Goonesekere

One meeting of the Staff Development Committee was held in 2003.

Principal Staff of NSF

Mr. M Watson
B.Sc. (Agric.) (Ceylon), M.Phil.(London)

- Director

S & T Policy Research Division

Mr. R M W Amaradasa
B.Sc. (Peradeniya), M.Sc. (Peradeniya)

- Director Scientific Affairs/Principal Scientific Officer

Ms. S I Wickremasinghe (Coordinator)
B.Sc. (Hons.) (Peradeniya), M.Sc. (Agric.) (Peradeniya)

- Senior Scientific Officer

Ms. R A S K Perera
B.Sc. (Hons.) (Colombo)

- Scientific Officer

MIS Unit

Ms. S I Wickremasinghe

- Project Manager

Mr. R P Pathirage
B.Sc. (Hons.) (Colombo), M.Sc. (Peradeniya)

- Scientific Officer

Mr. A P Hettiarachchi
B.Sc. (Colombo)

- Scientific Officer

Miss. P R M P Dilrukshi
B.Sc. (Hons.) (Peradeniya)

- Scientific Officer

Scholarships & Fellowships Division

Mrs. H A U Amarasinghe (Coordinator)
B.Sc. (Ruhuna), M.Sc. (Colombo)

- Director Scientific Affairs/Senior Scientific Officer

Ms. E M I C K Werapitiya
B.Sc. (Agric.) (Hons.) (Peradeniya)

- Scientific Officer

Ms. S A V Moorthy
B.Sc. (Jaffna), M.Sc. (Colombo)

- Scientific Officer

Research Grants Division

Ms. C G Yapa (Coordinator)
B.Sc. (Hons.) (Colombo)

- Assistant Director Scientific Affairs/
Senior Scientific Officer

Mr. A W J Karunasinghe
B.Sc. (Ruhuna), M.Phil. (Colombo)

- Scientific Officer (up to 01.09.2003)

Ms. P R Wijyaratne
B.Sc. (Hons.) (Peradeniya)

- Scientific Officer

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ANNEXES

Research Grants Awarded by the NSF

Status Summary – 2003

Discipline Status	Agriculture		Botany & Microbiology		Chemistry		Engineering & Built Environment		Food Science		Forestry		Geology & Mineral Resources		Information Technology	
	No. of ongoing grants as at 01.01.2003	06	11	17	27	05	01	02	02	02	02	02	02	02	02	02
No of ongoing grants as at 31.12.2003	04	13	15	24	04	04	02	01	02	01	02	02	01	02	02	02
Total no of applications received in 2003	-	14	13	13	07	04	05	03	02	03	02	02	01	02	02	02
Total no of grants awarded during 2003	-	04	04	03	-	03	02	02	02	02	02	02	02	02	02	02
Funds requested for new grants for 1st year 2003	-	2022720/-	1817360	571286/-	-	-	-	-	-	-	-	-	-	-	-	63550/-
Amount allocated for ongoing grants for 2003 (Rs)	711970/-	877602/-	1853000	5226675/-	454084/-	182320/-	990000/-	-	-	-	-	-	-	-	-	-
Grants completed	02	02	06	06	01	01	01	01	01	01	01	01	01	01	01	01
Grants withdrawn	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grants terminated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RS s appointed	-	02	03	02	02	01	01	01	01	01	01	01	01	01	01	01
Thesis (PG) received	-	02	01	-	-	-	-	-	-	-	-	-	-	-	-	-
RS s registered for PG	-	-	01	01	01	03	01	01	03	01	01	01	01	01	01	01
Publications	-	-	-	01	03	03	03	03	03	03	03	03	03	03	03	03
Foreign	01	02	01	04	10	10	10	10	10	10	10	10	10	10	10	10
Local	-	-	03	04	04	04	04	04	04	04	04	04	04	04	04	04
Communications	-	02	03	04	04	04	04	04	04	04	04	04	04	04	04	04

Cont'd.. II

Research Grants Awarded by the NSF (cont'd..... ii)

Status Summary - 2003

Discipline	Man & Biosphere	Mathematics	Medicine	Physics	Science Education	Social Sciences	Traditional Medicine	Veterinary Medicine & Animal Sciences	Zoology	Block grants	Total
No. of ongoing grants as at 01.01.2003	04	05	22	06	04	01	01	05	15	05	139
No. of ongoing grants as at 31.12.2003	03	02	23	05	03	01	01	07	17	02	129
Total no of applications received in 2003	-	01	46	03	03	-	05	06	18	-	141
Total no of grants awarded during 2003	-	-	08	01	1	-	-	04	07	-	37
Funds requested for new grants for 1st year 2003 (Rs)	-	-	2512416/-	318000/-	21822/-	-	-	1895390/-	3432092/-	-	12654636
Amount allocated for ongoing grants for 2003 (Rs)	335745	130000/-	5809306/-	890450/-	116570/-	-	-	2587390/-	2536615/-	-	22701727
Grants completed	01	02	06	02	02	-	-	02	06	03	42
Grants withdrawn	-	-	-	-	-	-	-	-	-	-	1
Grants terminated	-	01	01	-	-	-	-	-	01	-	04
RS s appointed	-	01	05	01	-	-	-	03	03	-	21
Thesis (PG) received	-	-	04	-	-	-	-	-	02	-	09
RS s registered for PG	-	01	05	-	-	-	-	03	-	-	15
Publications	-	-	02	02	-	-	-	-	-	-	9
Foreign	-	-	04	-	04	-	-	-	01	-	27
Local	-	-	06	01	01	-	-	02	04	-	25
Communications	-	-	-	-	-	-	-	-	-	-	-

Research Grants Awarded with SIDA Support

Annex: 2

Status Summary – 2003

Discipline Status	Social Sciences	Biotechnology	Botany & Microbiology	Engineering & Built Environment	Zoology	SIDA/ SAREC (Marine Science)	Food Science	Medicine	Total
No. of grants awarded in 2003	07	-	-	-	01	-	-	-	08
Grants completed in 2003	01	02	-	-	-	-	-	-	03
Grants withdrawn in 2003	-	-	-	-	-	-	-	-	-
Grants terminated in 2003	-	-	-	-	-	-	01	-	01
No of applications received during 2003	14	-	-	-	-	-	-	-	14
Amount allocated for 2003(Rs)	682410/-	-	-	72000/-	-	-	-	-	764410/-
Total no of ongoing grants as at 31.12.2003	20	-	01	04	02	01	01	03	32
RS s appointed	01	-	-	-	-	-	-	-	01
RS s registered for Postgraduate degree	-	-	-	-	-	-	-	-	-
Thesis (PG) received	01	-	-	-	-	-	-	-	01

Research Grants Awarded in year 2003 by the NSF

Annex : 3

Botany & Microbiology

Grant No.	Grantee/s & Institution/s	Project Title & Duration	Total Allocation (Rs)
RG/2003/BM/01	Prof. I.A.U.N. Gunatilleke Mr. K.B. Ranawana Univ. of Peradeniya Dr Channa Babaradeniya IUCN	A comparative study on the biodiversity of selected isolated hills in the lowland Penneplain of Sri Lanka 03 Years	1405760/-
RG/2003/BM/03	Dr B.M.P. Sinhakumara Univ. of Sri Jayewardenepura Nugegoda.	Light tolerance rankings for rain forest trees of the Sinharaja hill region, southwest Sri Lanka 03 Years	424720/-
RG/2003/BM/04	Dr M.M. Pathmalal Univ. of Sri Jayewardenepura Nugegoda.	Decomposition of bloom forming <i>M.aeruginosa</i> by algicidal bacteria and protozoa 03 Years	1042000/-

Chemistry

Grant No.	Grantee/s & Institution/s	Project Title & Duration	Total Allocation (Rs)
RG/2003/C/01	Dr. K.M. Nalin de Silva Dr. W. Rohini M. de Silva Department of Chemistry University of Colombo	Computational study of the non-linear optical (NLO) properties of organic macromolecules and transition metal complexes. 03 years	990000/-
RG/2003/C/02	Dr. Pradeep M. Yayaweera University of Sri Jayawardenapura Nugegoda	"Photo-current conversion efficiencies of solar cells sensitized with combination of cationic and anionic dye materials. 2 ½ years	655000/-
RG/2003/C/03	Dr.(Mrs) Janitha A. Liyanage Dept. of Chemistry Univ. of Kelaniya	Quantitative analysis and speciation of trace metals on wound healing. 03 years	653120/-
RG/2003/C/04	Dr. Veranja Karunaratne Dr. A. Wickremasinghe Dept. of Chemistry Univ. of Peradeniya	Pharmaceutically important compounds from endemic annonaceae species 03 Years	795000/-

Engineering & Built Environment

Grant No	Grantee/s/Institution/s	Project Title/Duration	Total Allocation (Rs)
RG/2003/E/01	Dr. Rohinton Emmanuel Dept. of Architecture Univ. of Moratuwa Moratuwa	Livable streets: Urban design strategies for the enhancement of user comfort in Sri Lanka 02 Years	637495/-
RG/2003/E/02	Dr. S.S.Namasivayam Ms. K. Ediriweera Ms. J.P. De Silva Athuraliya Mr. S.S. Abeysinghe Mr. N. Benaragama ACCMT, Moratuwa	Intelligent infant incubator 06 Months	157236/-
RG/2003/E/03	Dr. R. Shanthini Ms. M.A. Elangasinghe Dept. of Chemical Engineering Univ. of Peradeniya Peradeniya	Measurement of pollution levels of aerosol black carbon in the atmosphere in and around Kandy 01 year	76750/-

Forestry

Grant No.	Grantee/s & Institution/s	Project Title & Duration	Total Allocation (Rs)
RG/2003/FR/01	Prof. W.A.J.M. De Costa Dept. of Crop Science Faculty of Agriculture Univ. of Peradeniya Prof. Hemanthi Ranasinghe Dept. of Forestry & Environmental Science Univ. of Sri Jayawardenepura	Determination of the biomass production and carbon sequestration capacity of selected forest types of Sri Lanka	995640/-
RG/2003/FR/02	Dr G.A.D. Perera Dept. of Botany Univ. of Peradeniya	Structure and diversity of montane rain forest communities at the Knuckles mountain range, Sri Lanka	444594/-
RG/2003/FR/03	Mr Lasantha Manawadu Dept. of Geography Univ. of Colombo	Mapping and identification of forest types/ eco-systems in lower region of Kala Oya basin and assessment of inundation pattern by flooding during rainy season using GIS and remote sensing	359610/-

Geology & Mineral Resources

Grant No	Grantee/s/Institution/s	Project Title/Duration	Total Allocation (Rs)
RG/2003/GMR/01	Dr Shanthi de Silva The Open University	Groundwater resources assessment in Vavuniya district	414023/40

Medicine

Grant No	Grantee/s/Institution/s	Project Title/Duration	Total Allocation (Rs)
RG/2003/M/01	Dr. Nadira Karunaweera Dept. of Parasitology Fac. of Medicine, Univ. Colombo	Clinical and epidemiological study of cutaneous leishmaniasis in Sri Lanka	Rs. 455,000
RG/2003/M/02	Prof. D. J. Wiligama Dept. of Parasitology Faculty of Medicine Univ. Peradeniya	01 Year Molecular and isoenzyme characterization of leishmania in rodents and canids and the possible relationship to human infection in Sri Lanka 02 years	Rs. 399,000

RG/2003/M/03	Dr. A. Chandrasekera Fac. of Dental Sciences Prof. U. Ilangasekera Fac. of Medicine Univ. of Peradeniya	Effect of non-surgical periodontal treatment on haemoglobin glycosylation 3 Years	Rs. 530,000
RG/2003/M/04	Prof. N. P. Sunil Chandra Dept. of Microbiology Fac. of Medicine, Univ. of Kelaniya	Studies on Mycoplasma pneumoniae infections among patients with respiratory illness and its sero-epidemiology in the Gampaha district 2 years	Rs. 394,472
RG/2003/M/05	Prof. N. P. Sunil Chandra Dept. of Microbiology Fac. of Medicine Univ. of Kelaniya	Characterization and isolation of influenza viruses circulating amongst avians, pigs and humans in Sri Lanka 2 years	Rs. 1,124,630
RG/2003/M/06	Dr. L.D.J.U. Senierath Fac. of Medicine Univ. of Colombo	Quality of neonatal care services in a district of Sri Lanka and effectiveness of an intervention to improve the services 1 Year	Rs. 167, 000
RG/2003/M/07	Dr. K. Karunaratne Cancer Institute, Maharagama	Prevalence of Hepatitis B virus markers in household contacts of asymptomatic Hepatitis B carriers among pediatric cancer patients 1 Year	Rs. 97,000
RG/2003/M/08	Dr. Devika Iddawela Fac. of Medicine Univ. of Peradeniya	Epidemiological studies on toxocarasis in Sri Lanka 1 Year	Rs. 261,970

Physics

Grant No.	Grantee/s & Institution /s	Project Title & Duration	Total Allocation (Rs)
RG/2003/P/01	Mr N. Kumarasinghe Dept. of Meteorology	Design and development of an Automatic Weather Station (AWS) 10 Months	318000/-

Science Education

Grant No	Grantee/s/Institution/s	Project Title/Duration	Total Allocation (Rs)
RG/2003/SE/01	Ms P.R.K.A. Vitharana PGIS Univ. of Peradeniya	Teaching environment related activities at lower primary level towards attaining scientific literacy 02 years	114550/-

Research Grants Awarded by the NSF with SIDA Funding

Social Sciences/SIDA

Grant No.	Grantee/s & Institution/s	Project Title & Duration	Total Allocation (Rs)
RG/2003/SIDA/SS/01	Mr. Upali Vidanapathirana Dean, Faculty of Humanities & Social Sciences, Open University Nawala	Poverty dynamics and economic mobility in a few villages of Lunugamwehera Divisional Secretariat Division 08 Months	130235/-
RG/2003/SIDA/SS/02	Mrs. T. S. V. de Zoysa Dept. of Education Open University Nugegoda	A study of the factors influencing the educational achievement of institutionalized children in Sri Lanka (with special reference to the Colombo District) 02 Years	44750/-
RG/2003/SIDA/SS/03	Miss. B. D. D. Pathirana Dept. of Philosophy & Psychology University of Peradeniya	Promoting pro social behaviour and preventing early violence in young children 01 Year	172600/-
RG/2003/SIDA/SS/04	Mr. M. Karunanithy Dept. of Management Eastern University Mrs. K. Karunanithy Dept. of Economics Eastern University	Poverty, female headed households and entrepreneurship development in a war torn area (a case study within Trincomalee District) 06 Months	72750/-

RG/2003/SIDA/SS/05	Mrs. A. M. Hettige Dept. of Social Sciences Education University of Colombo Colombo 03.	A critical study of the "effective school" in Sri Lanka (with reference to the Colombo District)	45000/-
RG/2003/SIDA/SS/06	Ms. W. Seneviratne University of Colombo	02 Years Community information needs and information behaviour in selected rural communities in Sri Lanka	150000/-
RG/2003/SIDA/SS/07	Mr. M. Karunanithy Dept. of Business Management Studies, Trincomalee Campus Eastern University Mrs. K. Karunanithy Trincomalee Campus Eastern University	02 Years A study on ideal and actual supervisory behaviour as perceived by North - East provincial Council (NEPC) Middle level and Top level Officers 08 Months	67075/-

Veterinary Medicine & Animal Sciences

Grant No.	Grantee/s & Institution/s	Project Title & Duration	Total Allocation (Rs)
RG/2003/V/01	Dr. T. G. Wijewardena Prof. Preeni Abeynayake Fac. of Vet. Medicine Peradeniya	Investigation of the involvement of bacteria I diseases of shrimp in Sri Lanka 02 Years	763,560
RG/2003/V/02	Dr. R.P. V. J. Rajapakse Fac. of Vet. Medicine, Peradeniya Prof. H. R. Dharmaratne IFS	In vitro evaluation of anthelmintic activity of some indigenous medicinal plants on gastrointestinal nematodes in goats, in order to formulate a cost effective control programme 01 year	566,000
RG/2003/V/03	Prof. C. Bogahawatte Fac. of Agriculture Univ. of Peradeniya	Household consumption of farm-fresh liquid milk and other domestic milk products and its implications for imports of milk in Sri Lanka 02 Years	366,385
RG/2003/V/04	Dr. Anoja Wanigasekera Univ. of Peradeniya	Comparison of defaunation effect and concentration of conjugated linoleic acid in milk in coconut oil and sesame oil fed cows 02 Years	687,500

Zoology

Grant No	Grantee/s/Institution/s	Project Title/Duration	Total Allocation (Rs)
RG/2003/Zoo/01	Dr Nirmalee Palewatta, Dept. of Zoology University of Colombo	Taxonomy, diversity and distribution of tiger beetles of Sri Lanka 03 Years	446,000
RG/2003/Zoo/02	Dr (Mrs) K B Suneetha Dept. of Zoology University of Ruhuna	Development of morphological and genetic markers for differentiation of population subunits of an estuarine fish and a riverine fish in Sri Lanka. 03 Years	572620/-
RG/2003/Zoo/03	Mr Arthur Barnard Kotawalala Dept. of Zoology, University of Sri Jayawardenapura	Distribution and population status of theraphosid spiders (Tarantula) in forest covers of Ratnapura district. 01 Year	221305/-
RG/2003/Zoo/04	Dr S Hettiarachchi Dept. of Botany Mrs M P K S K de Silva Dept. of Zoology University of Ruhuna Matara	Determination of phylogenetic relationships among <i>Puntius spp.</i> of Sri Lanka. 02 Years	1620830/-
RG/2003/ZOO/05	Prof(Mrs) Asoka Pathiratne Dept. of Zoology Univ. of Kelaniya Kelaniya	Evaluation of biomarkers in food fish, Tilapia as potential tools in biological monitoring of aquatic pollution in Sri Lanka 03 Years	1062260/-
RG/2003/Zoo/06	Dr (Mrs) R K Sriyani Dias Dept. of Zoology University of Kelaniya Kelaniya	Taxonomic study of the worker ants collected from three districts of Sri Lanka and a survey on the distribution and relative abundance of <i>Aneuretus simoni</i> in Ratnapura district.	1024110/-
RG/2003/ZOO/07	Dr(Mrs) Padmini Krishnarajah Dept. of Zoology Univ. of Jaffna Prof. Charles Santilapillai Dept. of Zoology Univ. of Peradeniya	Status and taxonomy of Herpeto fauna and their conservation in Jaffna Peninsula, Sri Lanka 03 Years	437540/-

RG/2003/Zoo/08	<p>Mr Rohan Pethiyagoda Mr Madhava Meegaskumbura Mr Mohamed M Bahir Wildlife Heritage Trust of Sri Lanka. 95, Cotta Road, Colombo 08.</p>	National Freshwater Crab Survey	1043221/-
Sida/2003/Zoo//01	<p>Dr B.G.D.N.K. de Silva Dept. of Zoology Univ. of Sri Jayewardenepura Mr S.N. Surendran Dept. of Zoology Univ. of Jaffna</p>	<p>3 Years</p> <p>Development of micro satellite DNA markers for distinguishing species B and E of <i>Anopheles culicifacies</i></p> <p>03 Years</p>	1,374,958

NATIONAL SCIENCE FOUNDATION

BALANCE SHEET AS AT 31ST DECEMBER - 2003

(Detailed balance sheet attached)

			Rs'000
ASSETS	20-3	20-2	20-2
Non Current Assets			
Property plant and equipment	<u>53425</u>	<u>52084</u>	
		53425	52084
Current Assets			
Inventories/Stock	1790	2111	
Trade and other receivables	32331	37824	
Prepayments	162	302	
Cash and cash equivalents	<u>9790</u>	<u>14507</u>	
		44073	54744
Total assets	<u>97498</u>		<u>106828</u>
Net assets & Liabilities			
Capital and Reserves			
Accumulated Fund	26432	36933	
Reserves -Revaluation Reserve	<u>51117</u>	<u>47508</u>	
		77549	84441
Non current liabilities			
Provision for gratuity	7448		
Differed revenue	<u>1295</u>	<u>NIL</u>	
		8743	7055
Current liabilities			
Payables	4102	4654	
Accrued Expenses	<u>7104</u>	<u>10678</u>	
		11206	15332
Total equity and liabilities	<u>97498</u>		<u>106828</u>

NATIONAL SCIENCE FOUNDATION

INCOME AND EXPENDITURE FOR THE YEAR ENDED 31ST DECEMBER - 2003

(Detailed Income & Expenditure account attached)

			Rs. '000
Revenue	20-3	20-2	
Government Grant	22868		24000
Other Income			
Interest received	163		169
Subdry Income	41		52
Sale of Publications	278		347
Photocopy receipts	31		68
Receipts from printing outside jobs	144		38
SLSTIC Income	218		332
Profit from sale of Fixed Assets	-		13
Differed Revenue	<u>185</u>		
		<u>23928</u>	25019
Expenditure			-
Personal Emoluments			
Salaries & allowances	14846		14516
Employees Provident Funds	1880		1797
Employees Trust Funds	376		361
Provision for retiring gratuity	469		604
Overtime	237		261
Holiday payment	9		23
Uniforms	81		80
Staff training	<u>40</u>		<u>54</u>
	17938		17696
Travelling	22		10
Supplies - Stationary & consumables	694		667
Maintenance	1433		1519
Contractual Service	2639		2461
Research and Development/Training	-		-
Others	3721		3733
Depreciation	<u>3776</u>		<u>3884</u>
		<u>30223</u>	29970
Surplus of Deficit over the income			
before extraordinary items		(6,295)	(4,951)
Extraordinary items (Net Profit or loss)		-	-
Net Surplus/Deficit for the period		<u>(6,295)</u>	<u>(4,951)</u>

Cash Flow Statement - 2003

	Rs.'000 2003	Rs.'000 2002
<u>Cash flows from operating Activities</u>		
Net excess of expenditure over income	6,295	4,950
<u>Adjustments for</u>		
Depreciation	(3,776)	(3,884)
Bad Debts		(8)
Acquisition of assets	(12)	(109)
Provision for Gratuity	(468)	(604)
Provision for doubtful debts	(213)	(54)
Fixed Assets written off		(14)
Adjustments made through the provision for doubtful debts	7	
Profit on sale of fixed assets		13
Deffered Revenue	185	
Operating loss before working capital changes	(2,018)	(290)
Net decrease/increase in trade other receivables	(2,976)	1,804
Decrease in inventories	321	85
Net decrease/increase in trade payables	(3,700)	9,030
Cash generated from operations	(6,355)	10,919
Net cash from operating activities	(8,373)	10,629
<u>Cash flows from Investing Activities</u>		
Outflow from activities	(24,386)	(38,023)
Purchase of assets	(1,510)	(1,476)
Proceeds from sale of equipments		30
Net cash used in investing activities	(25,896)	(39,469)
<u>Cash Flows from Financial Activities</u>		
Contribution from Government	20,550	23,030
Foreign Aid	9,002	16,000
	29,552	39,030
Net cash from financing activities	(4,717)	10,190
Cash & cash equivalent at beginning period	14,507	4,317
Cash & cash equivalent at end of period	9,790	14,507

NOTES ON ACCOUNTS

1 **General Accounting**

The Financial Statements have been prepared in accordance with generally accepted accounting principles on a historical cost basis. The fundamental accounting assumptions and policies relevant in accounting have been adhered to on a consistent basis as in the previous year. Expenditure on equipment purchased under capital budget items have been excluded from expenditure under respective funds and is shown under the relevant categories of equipment.

The treatment of grants related to assets have been treated as deferred income which is recognized as income on a systematic and rational basis over the useful life of the asset as per SLAS 24.

1.1 **Documentation Unit Capital Fund Expenditure**

	Rs.
1 SLSTIC Equipment	360,996.50
2 SLSTIC Books	58,067.94
3 SLSTIC Workshops & Seminars	<u>13,959.80</u>
	433,024.24
Less: Cost of Equipment & Books	<u>419,064.44</u>
360,996.50+58,067.94	<u><u>13,959.80</u></u>

1.2 **Grants for Research & Other Scientific Work**

Our policy in funding research grants as formulated in the Research Grants contractual agreement is to transfer the funds to the institution where the grantee is employed in installments. If there is an unused balance of funds with the relevant institution, after completion of the project, the balance has to be refunded to NSF. Hence we treat the funds transferred to the institution as expenditure. At the end of the project if there remain unutilized funds, we create a debtor.

	Rs.
Actual expenditure for the year	11,039,833.15
Accrued expenditure	<u>4,320,842.25</u>
	15,360,675.40
ICGEB membership fee for years 1999 & 2000	<u>1,941,600.00</u>
	17,302,275.40
Zoology	<u>2,779,820.37</u>
	20,082,095.77
Less: Cost of Fixed assets	<u>363,020.00</u>
	19,719,075.77
Less: Prior year adjustments (Net)	<u>4,297,970.73</u>
	<u><u>15,421,105.04</u></u>

1.3 Man & the Biosphere Expenditure

	Rs.
1 MAB Expenditure	197,442.50
2 MAB/13/03	52,864.75
	<hr/>
	241,307.25

1.4 Miscellaneous Fund Expenditure

		Rs.
1 Participation in International Scientific Work		75,538.45
2 Research Training		544,197.32
3 Seminars & Symposia		26,241.56
4 Special Publications	4,030.50	
<i>Less: Natural Resources of SI - 2000</i>	1,128.00	
<i>Guidelines for the Technology</i>	<hr/> 2,902.50	
<i>Safe use of RDN</i>	4,030.50	
6 Rehabilitation of Assets		<hr/> 150,190.03
		<hr/> <hr/> 796,167.36

1.5 Scientific Reserve Fund

A new fund named Scientific Reserve Fund has been created in year 2003. This fund has been created by crediting the remaining funds received for seminars/Projects.

1.6 Foreign Aid Expenditure

	Rs.
SIDA supported projects	7,523,827.66
Less: Cost of fixed Assets	<hr/> 65,234.00
	7,458,593.66
Add: Prior Year Adjustment	<hr/> 186,074.04
	<hr/> <hr/> 7,644,667.70

1.7 Research Committee Expenditure

	Rs.
1 Agriculture	9,624.88
2 Biotechnology	34,563.50
3 Biological Sciences	2,000.00
4 Chemical Sciences	2,605.35
5 Editorial Board of JNSF	21,374.00
6 Engineering & Built Environment	9,570.00
7 Forestry	4,800.00
8 Social Sciences Research	24,398.00
9 S&T Information	2,700.00
10 Science Education	35,211.60
11 Traditional Medicine	12,900.00
12 Zoology	24,060.18
13 Physics	28,874.37
14 Mathematical Sciences	2,700.00
15 Science Communication	8,163.00
16 Medicine	31,157.40
17 Botany Microbiology	18,830.00
18 Information Technology	8,580.00
19 Vet. Medicine & Animal Science	11,157.25
20 Food Science	19,360.00
21 Chemistry	17,160.00
22 Life Sciences	3,986.60
23 Geology & Mineral Resources	7,800.00
24 Bioethics	9,000.00
	<u>350,576.13</u>

1.8 Sri Lanka Scientific & Technical Information Center Expenditure

	Rs.
1 SLSTIC Maintenance & Repairs	130,122.03
2 SLSTIC Periodicals	142,802.52
3 SLSTIC Paper & Board	(26,445.85)
4 SLSTIC Consumables & Chemicals	94,895.45
5 SLSTIC Miscellaneous	2,079.05
6 SLSTIC Referering charges	5,000.00
7 Printing - Consumables & Chemicals	298,273.60
8 Printing - Paper & Boards	11,841.00
9 Printing - Maintenance & Repairs	38,917.20
	<u>697,485.00</u>

1.9 Sale of Publications

	Rs.
1 NSF Journal	222,457.00
2 Other Publications	33,794.50
3 SSR journal	3,816.00
4 Posters	(6,200.00)
5 MAB Publication	2,721.00
6 Vidurawa	14,307.50
7 Food Security	(13,520.00)
8 Tutor Package	139.06
9 Checklist of Flowering Plants	(7,774.00)
10 Natural Resources of Sri Lanka (2000)	31,727.31
11 Checklist of Rubber pathogen	120.00
12 Waders of Sri Lanka	(2,173.46)
13 New year cards	457.00
14 Ficus bengalensis	38.61
15 Guidelines for the safe use of RDN	(1,489.80)
	<u>278,420.72</u>

1.9. a SLSTIC Income

	Rs.
1 Income received from WINISIS	26,938.01
2 Other Income	62,803.00
3 Internet membership fees	128,800.00
	<u>218,541.01</u>

2 Assets & the basis of their valuation

Depreciable assets & Depreciation

Depreciation has been provided on original cost or at valuation on a straight line basis consistent with that of the previous year and is calculated to write off the assets over their estimated useful lives

All motor vehicles at NSF (Nine vehicles) have been revalued during year 2003. The valuation was done by the Automobile Association. Revaluation have been effected through the Revaluation Reserve Account.

Capitalization of Assets

Treatment of accounting in capitalizing of equipment purchased out of Capital Budget Votes is to debit the relevant category of equipment.

02.01 Debtors

	Rs.
Total debtors	9,506,004.91
Less: Provision for doubtful debts	338,739.36

provisions has been provided for the debts outstanding over 3 years.

3 Liabilities

03.01 Creditors

Creditors amounting to Rs. 4,083,815.53 represents monies held by NSF as given below,

	Rs.
1 Sundry Creditors	2,302.50
2 Staff Creditors	1,879.99
3 Man Power Survey A/C	268,945.46
4 Research Project on energy Ministry of Science & Technology - Year 2001	2,884,553.50
5 Science Magazine - Year 2002	681,357.00
6 World Science Day - Year 2002	8,457.32
7 Funds received for Sinharajah Biosphere Project - Year 2002	1,823.26
8 Natural Resources of Sri Lanka - 2000 Sinhala translation - Ministry of Environment-2003	171,995.50
9 Study on the Bundala National Park- 2003	45,001.00
10 ADB News letter - 2003	17,500.00
	<hr/> <hr/> 4,083,815.53

Tender Deposit

	Rs
Tender for Colour washing - Year 2002	<hr/> <hr/> 10,750.00

3.2 Employees Benefit

All employees are covered by EPF & ETF. An approved Medical Scheme is provided in addition to the normal Welfare facilities available.

3.3 Retiring Gratuity

Provisions have been made in the accounts in respect of liability for retiring gratuity.

	Rs
Account paid for the year	<hr/> <hr/> 76,160.00
Provision for the year	<hr/> <hr/> 468,455.00

4 Publications for the value of Rs 3,593,400.50 (Valued at selling price) is available with us.
This amount includes the stock out on consignment basis for the value of Rs. 177,645.00.

5 NSF owns 13 vehicles They are located as follows

At NSF	12	(Includes 02 push Bicycles)
With Research Grantees	<u>1</u>	
	<u>13</u>	

6 **Funds Drawn from the Treasury during - 2003**

Consolidated Funds Rs 20,550,000.00

Recurrent Funds Rs. 22,868,000.00

Foreign Aid Funds Rs. 9,002,000.00

Funds drawn from the Treasury from 1968 to 2003

Consolidated funds Rs. 254,569,276.45

Foreign Aids Rs. 260,031,164.13



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கணக்காளர் தலைமை அலுவலர் திணைக்களம்



AUDITOR-GENERAL'S DEPARTMENT

මගේ අංකය
எனது இல. }
My No. }

EL/H/NSF/FA/2003
 Your No. }



27 May 2004

The Chairman
National Science Foundation

Report of the Auditor General on the accounts of the National Science Foundation for the year ended 31 December 2003 in terms of Section 14(2)(c) of the Finance Act No.38 of 1971

The audit of accounts of the National Science Foundation for the year ended 31 December 2003 was carried out under my direction in pursuance of provisions in Article 154(1) of the Constitution of the Democratic Socialist Republic of Sri Lanka read in conjunction with Section 13(1) of the Finance Act No.38 of 1971. My observations which I consider should be published with the annual report of the Foundation in terms of Section 14(2)(c) of the Finance Act appear in this report.

1.2 Scope of Audit

Audit opinion, comments and findings in this report are based on a review of the financial statements presented to audit and substantive tests of samples of transactions. The scope and the extent of such review and tests were such as to enable as wide an audit coverage as possible within the limitations of staff, other resources and time available to me. The audit was carried out in accordance with Sri Lanka Auditing Standards, methods and practices to obtain reasonable assurance as to whether the financial statements are free of material misstatements. The audit included examination of evidence supporting the amounts and disclosures in financial statements and assessment of accounting principles and significant estimates and judgments made in the preparation of financial statements, evaluation of their overall presentation and determining whether accounting policies adopted were appropriate, consistently applied and adequately disclosed. Sub-sections (3) and (4) of Section 13 of the Finance Act No.38 of 1971 give discretionary powers to the Auditor General to determine the scope and extent of the audit.

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2. Accounts

2:1 Audit Opinion

Except for the effects on the financial statements of the matters referred to in paragraph 2:3 of my report, I am of opinion so far as appears from my examination and to the best of my information and according to the explanations given to me, that the financial statements have been prepared and presented in accordance with the generally accepted accounting principles and the stated accounting policies as set out in notes (from 1 to 6) to the financial statements and give a true and fair view of the financial position of the Foundation as at 31 December 2003 and the financial results and cash flow for the year then ended.

2:2 Financial Results

The activities of the Foundation are being operated under the General Fund and 5 Special Funds. According to the accounts presented, the financial result of the working of the General Fund of the Foundation for the year ended 31 December 2003 was a deficit of Rs.29,163,482 before taking into account the Government Grant for recurrent expenditure as compared with the deficit of Rs.28,950,479 for the preceding year.

The deficit was reduced to Rs.6,295,482 after taking into account the Government Grant of Rs.22,868,000 received for recurrent expenditure of the year under review and the foreign aid. The deficit for the previous year was reduced to Rs.4,950,479 after taking into account the Government Grant of Rs.24,000,000 received for recurrent expenditure for that year.

2:3 Comments on Accounts

2:3:1 Accounting Policies

The money released to institutions and researchers for implementation of projects had been accounted for as expenditure at the time of releasing such money. The amount so shown during the year under review was Rs.18,140,496.

2:3:2 Inappropriate Disclosures in the Accounts

A sample of library books, 10 types of high priced books available for sales and stock of stores were subjected to physical verification in 2003. The following observations are made in connection with this physical verification.

- (a) Library books and other stock of stores had not been verified and their value shown. Adjustments had not been made in the accounts for shortages and excesses.
- (b) The board of survey had not furnished a complete summarized report and its recommendations. A sample of the library books only had been verified and the physical balances had not been reconciled with the stock books.

2:3:3 Accounting Deficiencies

The following observations are made.

- (a) A sum of Rs.15,265 remained as a balance after the completion of the activities pertaining to Research No. R.G/2000/P/01. This had been transferred to Research No. RG/2003/200/01. However, it had been erroneously shown under debtors.
- (b) As a result of accounting deficiencies, a sum of Rs.302 had been credited to the suspense account in order to balance the accounts.

2:3:4 Unreconciled Control Accounts

The value of net assets as per register of fixed assets was Rs.53,332,713. It had been shown as Rs.53,425,582 in the accounts. Accordingly, it was observed that the net assets had been overstated by Rs.92,869.

2:3:5 Lack of Documentary Evidence for Audit

As a result of not submitting the physical verification reports relating to fixed assets valued at Rs.26,578,389 and stocks amounting to Rs.241,152 and confirmations pertaining to tender deposits and technology deposits amounting to Rs.96,200, the items concerned could not be satisfactorily vouched or accepted in audit.

2:3:6 Non-compliance with Laws, Rules and Regulations

Action had not been taken in terms of Section 13(6) of the Finance Act No.38 of 1971, F.R. 104(2), State Accounts Circular No.364(3) of 30 September 2002 and the Treasury Circular No.842 of 19 December 1978.

3. Financial and Operating Review

3.1 Financial Performance

The financial results of the Foundation and the balances of the General Fund for the year under review as compared with those of the past 5 years are given below.

Year	Financial Results (Deficit)	Balance of the General Fund as at 31 December (Debit Balance)
	Rs.	Rs.
2003	(6,295,482)	(60,979,278)
2002	(4,950,479)	(54,695,523)
2001	(5,690,052)	(50,054,415)
2000	(8,836,448)	(44,526,178)
1999	(5,420,994)	(36,328,209)
1998	(5,145,485)	(32,372,057)

Accordingly, as a result of the continuous high losses of the Foundation, it was observed that after utilization of internal and external funds, there was a significant erosion of the capital reserve during the year under review too.

3:2 Performance

The performance relating to the Research Awards of the National Science Foundation for the year under review as compared with that of the previous year is given below.

	2003	2002
	-----	-----
Rewards in existence as at January 01	139	154
Rewards in existence as at December 31	161	144
Total no. of applications received during the year	155	44
No. of rewards given during the year	45	10
Funds requested for new rewards for the first year	Rs. 1,654,636	3,840,518
Money allocated for rewards for 2002	Rs. 23,466,137	23,704,406
Rewards fulfilled	45	34
Rewards cancelled	01	-
Rewards abandoned	05	01
Research Assistants appointed	21	10
Postgraduate degree thesis obtained	10	07
Research Assistants registered for Postgraduate degrees	15	07
Media	25	22
Publications		
Foreign	09	09
Local	27	06

The following observations are made in connection with performance.

- (i) The number of applications received for research awards during the year under review was 155. The rewards given was 45. It was 44 and 10 respectively during the previous year.
- (ii) According to the above data, improvement is shown in the rewards of the year under review. Researches abandoned had increased from 1 to 5 as compared with the previous year. As a result, implementation of researches shows a downfall.

3:3 Transactions without proper Authority

During the year under review, a permanent employee and an employee on contract basis had been recruited and a sum of Rs.137,316 had been paid to them as salaries without obtaining the approval of the Department of Management Services.

3:4 Creation of a Fund in respect of the Provision for Payment of Gratuity

The accumulated provision for gratuity as at 31 December 2003 was Rs.7,447,860. However, the Foundation had not created a fund to meet liabilities as and when they arise.

3:5 Uneconomic Transactions

A division named "Technology Examination Centre" had been formed to fulfill matters pertaining to improvement of science that could be implemented by utilizing funds given to the National Science Foundation through the Science and Technology Development Project. The work had been performed by appointing a staff including a Project Director who was a member of the staff of the National Science Foundation. A monthly payment of Rs.35,000 had been made to the Director for this purpose. During the year under review, the Project had given Rs.2,614,060. Of this, a sum of Rs.1,870,807 representing 71.5% of the total amount had been paid as salaries to the overall staff.

3:6 Idle Assets

The value of stocks unutilized during the year under review amounted to Rs.153,142.

3:7 Identified Losses

The following observations are made.

- (a) Five researches carried out by spending Rs.416,975 had been abandoned halfway.
- (b) A loss of Rs.31,157 had been incurred from the sale of 5 publications during the year under review.

3:8 Extraneous Items

The following observations are made.

- (a) During the year under review, the National Science Foundation had spent Rs.3,493,918 on behalf of 60 persons for foreign tours on travelling, subsistence allowances and other expenses. The participants were required to submit a report from information pertaining to their tour after returning to Sri Lanka. They were also expected to hold seminars to enlighten the other scientists regarding the discussions held there. Accordingly, 5 officers only had submitted their reports and conducted seminars. 6 officers had submitted their reports only and 14 officers had only conducted seminars. It was observed in audit that 35 officers had neither submitted their reports nor conducted seminars.
- (b) The National Science Foundation had paid Rs.4,650 to a supplier for type setting a copy of a science drama. It was observed in audit that the telephone number and the address furnished by him regarding this transaction were fictitious

3:9 Research Operations

The researches done are not properly administered by the National Science Foundation. As a result, there were delays in research activities without due reasons and stoppage of work. Appointment of research assistants by research officers according to their whims and fancies by not obtaining approval had taken place. All these research work had been carried out by giving advances. The sum of Rs.3,975,234 given as advances to 56 projects from 1998 to 31 December 2003 had not been settled yet. The Foundation had not carried out effective follow up action on the funds released for research projects. The Project ledger had not been properly maintained.

3:10 Implementation of Projects

The Foundation had obtained Rs.3,200,000 from the Ministry of Science and Technology for implementing an Energy Research Project. A sum of Rs.315,447 had been spent for the objectives of the Project during the past 3 years and the year under review. Out of the funds of the Project, a sum of Rs.2,884,553 remained unutilized.

3:11 Security Services

The same institution continued to perform security services from 1979 without calling for annual quotations. There was no agreement with the institution concerned. During the year under review, a sum of Rs.472,652 had been paid for this purpose.

3:12 Budgetary Control

There were significant variations between the budgeted and the actual figures thus indicating that the budget had not been made use of as an effective instrument of management control.

4. Systems and Controls

The deficiencies observed during the course of audit were brought to the notice of the Chairman of the Foundation, from time to time. Special attention is needed in respect of the following areas of control.

- (a) Maintenance of running charts and log books
- (b) Maintenance of personal files
- (c) Debt control
- (d) Control over fixed assets

Sgd./S.C. Mayadunne
Auditor General

/mt./Elbnsffa-2003-14(2)(c)

Comments on the Auditor General's Report for the year ended 31.12.2003.

2:3 Comments on Accounts

2:3:1 Accounting Policies

We have been adopting this policy since 1992. We state our policy in our notes on accounts. Rs. 18,140,496 is the total expenditure for year 2003. Stating this figure along with the comment gives a wrong picture.

2:3:2 Inappropriate Disclosures in the Accounts

- a) The Board of survey reports were received after the accounts were submitted to the auditors. If there are any adjustments to be made in the accounts it will be made in year 2004
- b) Physical stock of library books has been compared with the accession register at the library

2:3:3 Accounting deficiencies

- a) Though NSF has requested university of Colombo to transfer Rs. 15,254.64 from completed grant No. RG/2000/P/01 to RG/2003/Z/00/01, University of Colombo has not informed us, that it has effected the transfer. Hence we have shown the Rs. 15,254.64 under sundry debtors. We will make the necessary entries in our books once the University of Colombo confirms that the transfer has been made.
- b) The difference of Rs. 302/- will be traced. Adjustments will be made in year 2004.

2:3:4 Unreconciled Control Accounts

The difference of Rs. 92,869/- is not due to entries made in year 2003. Hence we need to reconcile the previous years to find out whether the reported figure is correct. We will reconcile the previous years figures and if adjustments are necessary we will rectify in year 2004.

2:3:5 Lack of evidence for Audit

Board of Survey reports were received in year 2004, if adjustments are necessary in our books of accounts, it will be made in year 2004.

2:3:6 Non compliance with laws, rules and regulations

- | | | |
|---|---|---|
| 1971 No. 38 Finance act 13 (6) - | - | Annual Report has been handed over to the Auditor General by our letter dated 27.02.2004. |
| Finance regulation 104 (2) | - | We have had no losses during the year 2003. |
| 2002 Sept. 30 th No. 364 (3) | - | We have noted to inform the relevant authorities if we pay VAT for Rs. 25,000/- or more |

Public Finance Circular

1978 Dec. 19th No. 842 Treasury Circular

Our fixed asset registers are maintained according to Kalamazoo System

(3) Financial and operating review

3:1 Financial performances

Our Expenditure over Income is due to non cash transactions such as depreciation and gratuity provision. Our expenditure is within the Budgetary allocations. But in year 2003, we had to accrue the payments to be made due to insufficient budgetary allocation for our recurrent expenditure

3:3 Transactions not supported by adequate authority

- a) The post of Director Information fell vacant due to the resignation of Mrs. P. D. Talagala in April 2003. With the permission granted by the Ministry of Economic Reform, Science & Technology, applications were called through press advertisements and a suitable officer was selected and appointed on permanent basis.

The term of the Editor who functioned under the TWC (ADB Project) expired in October, 2003 and a new Editor was appointed with the concurrence of the ADB Project office for a period of 6 months.

3:4 Fund for the payment of gratuity

According to the prevailing regulations we cannot have such a fund, since the treasury releases funds required for payment of gratuity.

3:5 Uneconomic Transaction

Work of TWC cannot be handled by a single person as mentioned by the Auditors. Project Manager of the TWC is a duly approved contract position under the S&T Personnel Development Project (STPDP) of the Ministry of Science and Technology. The payment of Rs. 35,000/= to the manager is with the approval of the STPD project office.

Only the expenses related to salaries of TWC staff and consumables (not all) are administered through the NSF. The major portion of the funds related to TWC is managed directly by the project office.

Hence the percentage mentioned in the query gives a wrong picture.

3:6 Idle Assets

Out of the amount of Rs. 153,142/= items for the value of Rs. 99,327/= are being used as and when the printing division/ office staff requires them.

3:7 Identified Losses

- a) RG/98/C/02 - Comment incorrect. Project was completed, but the final report was long delayed. Hence the grant was terminated. Subsequently he submitted the final report. Which was accepted as satisfactory by the Research Committee
- RG/2001/NR/01 - Comment incorrect. This grant was given to purchase equipment, since the equipment was not purchased we have requested to refund the funds to NSF.
- RG/98/M/01 - Comment incorrect. The progress of this grant was not satisfactory. Hence the research committee recommended for the Board of Management to terminate the grant.
- Sida/98/P/05 - Comment incorrect. Since there was no progress, NSF decided to terminate the grant.
- RG/SSSL/2001/01 - Comment incorrect. Grantee has been transferred to another Institution. There was no competent person to take it over & continue the project. Hence the grant was terminated.

b) Since we are a service organization, it cannot be considered as a loss.

- 3:8 a) According to the award letter the grantee has to submit a report. A reminder is being sent to the grantees who have not yet submitted the report. If they do not submit the report, their applications will not be considered for funding in the future. According to the award letter grantees may be required to give a seminar in order to share the event with other Scientists. NSF/SLAAS science forum is organized every month. Two speakers from related topics are selected to do a seminar. Hence only a maximum of 24 grantees can be selected for doing seminars in a year. Hence year 2003 grantees are scheduled to conduct seminars till June 2004.
- b) This is a receipt submitted by one of our grantees for type setting. We have made the payment in favour of the supplier. We obtained grantee's comments on this audit query, and we have verified the correct address and the telephone number of the supplier.

3:9 Administering Research Grants

Out of Rs. 3,975,234/-, Rs. 3,204,013/- is for debtors created in 2003. We request the Institutions to refund the balance funds of completed projects and also we have requested the Universities to utilize the balance funds of completed projects for ongoing projects.

Our grant ledger is updated at the moment the payment is being made and the statements are received from the Universities/ Institutions.

3:10 Implementation of Projects

We have allocated Rs. 920,000 for research grant No. RG/2004/1/02 titled "Direct conversion of Solar radiation into electricity through dye sensitized solar cells" out of these funds.

Also Rs. 243,400/- is committed for the ongoing research projects.

3:11 Security Service

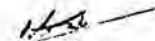
Tenders have been obtained to appoint a security service. A suitable service will be selected soon.

3:12 Budgetary Control

As far as possible we use the Budget as an instrument of control.

4. Systems and Control

Noted for action



M. Watson
Director
National Science Foundation