

National Science Foundation,
47/5, Maitland Place,
Colombo 7.

22.11.2001

Hon. Minister of Science and Technology,
Ministry of Science and Technology,
320, T.B.Jaya Mawatha,
Colombo 10.


Dear Sir,

**Annual Report of the Natural Resources, Energy & Science Authority of Sri Lanka/
National Science Foundation for the period 1st January to 31st December 1998.**

In terms of Section 16 (3) of the Natural Resources, Energy & Science Authority of Sri Lanka Act No. 78 of 1981 and Section 40(3) of Science and Technology Development Act No. 11 of 1994, I have the honour to submit the Annual Report of the Natural Resources, Energy and Science Authority of Sri Lanka / National Science Foundation for the period 1st January to 31st December, 1998 together with-

- (a) A copy of the Audited Income and Expenditure Account
- (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 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, and comes under the Ministry of Science and Technology. It is the successor to the Natural Resources Energy and Science Authority (NARESA) which was set up in 1982 by Parliament Act No. 78 of 1981. NARESA itself succeeded the National Science Council (NSC) which was instituted by Act No. 9 of 1968.

The Board of Management of the NSF consists of the Chairman, Director and Members appointed by the Hon. Minister of Science and Technology. The Director functions as the Chief Executive.

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.

Summary Financial Status - 1998

- ◆ The request for Consolidated Funds was Rs. 32,931,680/=. The treasury approved and granted Rs 20,000,000/=.

- ◆ The recurrent estimate was Rs. 20,500,000/=. However, subsequently, a 10% of provision on recurrent expenditure other than the financial provision for salaries, pensions and relief to low income groups, was frozen.
- ◆ The approved Foreign Aid estimate for the year was Rs. 40,000,000/=.

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Sponsorship of Scientific Research

The Research Grants Scheme

Under this scheme, applications are invited for grants for research projects by advertisement in national newspapers annually. Applications received are screened and evaluated by the Working Committees and recommendations are made on a priority basis for approval by the Board of Management. The grants awarded are monitored regularly through progress reports submitted and progress review seminars. Once the research project is completed, a final report is submitted by the grantee, which is evaluated by a specialist appointed by the Working Committee. The evaluation takes into account any post graduate degrees awarded to personnel associated with the project and also the intrinsic scientific contributions made towards widening the horizons of knowledge and/or application of science and technology for development.

Details of grants awarded during the year are given in the Tables annexed.

Progress Review Seminars

As part of the process of monitoring and evaluation, NSF held progress review seminars to evaluate the progress of projects in different disciplines. In addition to Steering Committee members and grantees, guest scientists participated in these seminars by invitation and contributed their expert opinions. The details of these seminars are given below.

Discipline	Date	No. of Presentations
Biological Sciences	03 April	06
Biological Sciences	16 October	06
Agriculture	21 August	07
Energy	30 October	09

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Seminars and Workshops

Theme Seminars, Workshops, Panel Discussions

The following seminars and workshops were held during 1998, in order to enable scientists/researchers to share experiences, to update knowledge and also to provide fora for discussion.

- Theme - **EL Nino and Disaster Preparedness**
Date - 07 April 1998
Organized by - Steering Committee on Natural Resources
Venue - NSF
No. of Discussants - 24

This panel discussion was organized with a view to recognize the need for an assessment to be made of the effect of past El Nino phenomena on various aspects of climate and productivity, pest incidents and health problems in the country. It was imperative that a collection of firm data and analysis of data in various fields be made to form conclusions on the possible impacts in the future.

- Theme - **Research Priorities in Health**
Date - 27 August 1998
Organized by - Steering Committee on Medical & Veterinary Sciences
Venue - NSF
No. of Resources Persons - 05
No. of Participants - 40

This seminar was held with the objective of discussing and revising current priority areas in Health Sciences. There were five presentations on "Research Settings - Best buys", "A National Planner's Perspectives", "A Health Planner's Perspective", "National Priorities in Veterinary Research" and "A Researcher's Point of View". This seminar was well attended with participation from Universities, Research Institutes and Colleges of Medicine.

- Theme - **Science and Technology and IPR Issues - Industry and Invention**
Date - 22 January 1998
Organized by - Committee on Intellectual Property Rights
Venue - NSF
No. of Resource Persons - 05
No. of Participants - 50

The objective of this workshop was to raise awareness on aspects of IPR. The keynote address was given by Mr. N.R. Subbaram, former Head of the Intellectual Property Management Division of CISIR India. General aspects of IPR, implications of the TRIPS agreement with reference to Third World scientists, the pharmaceutical and herbal medicine industry in Sri Lanka, and problems faced by the inventor were discussed at the workshop. Around 50 participants

including scientists, inventors, representatives from the pharmaceutical industry and attorneys attended. A report of the workshop, including recommendations, was prepared.

- Theme - **Agricultural Research Management**
Date - 23 and 24 November 1998
Organized by - Steering Committee on Agriculture and Animal Husbandry
Venue - Postgraduate Institute of Agriculture, Univ. of Peradeniya
No. of Resource Persons - 07
No. of Participants - 45

The objective of the workshop was to apprise the researchers of the principles of agricultural research management. Participants were from the National Agricultural Research System and the Universities. The presentations covered areas such as "Planning and Directing Research", "Human Resource Management", "Leadership Building", "Performance Evaluation", "Identification and Prioritization of Research", "Review and Monitoring of Research" etc.

- Theme - **Sri Lankan Science Literature**
Date - 22 September 1998
Organized by - Steering Committee on Science Education
Venue - NSF
No. of Resource Persons - 08
No. of Participants - 22

The objective of the workshop was to provide information on Sri Lankan Science Literature, to the science teaching system. Journalists from the Lakehouse, Lakhanda and the Island, participated in this workshop. The recommendations made have been documented. A follow up meeting has been planned to discuss the articles published in newspapers by these participants.

- Theme - **Panel discussion on the Earth Tremor in Kandy**
Date - 09 December
Organized by - NSF and Geological Society of Sri Lanka
Venue - NSF
No. of Discussants - 07
No. of Participants - 25

This panel discussion on the earth tremor in Kandy on the 23 November was chaired by Prof. Kapila Dahanayake, Chairman, NSF. The members of the panel included representatives from the Department of Meteorology, Geological Survey and Mines Bureau, University of Peradeniya, Victoria Reservoir Project, Geological Society of Sri Lanka and the Mahaweli Authority of Sri Lanka. The discussants answered questions posed by journalists and representatives from the electronic media. The need to instal a network of Seismometers was highlighted at this discussion.

●	Theme	-	Taxonomic Studies of Fauna
	Date	-	19 March 1998
	Organized by	-	The Committee on Zoological Survey of Sri Lanka
	Venue	-	NSF
	No. of Resource Persons	-	03
	No. of Participants	-	25

The objective of this workshop was to have a discussion with the Zoologists who were interested in taking part in the ZSSL, with a view to and identify the important areas of study.

Public Awareness Seminar Series - "Science for Everyday Life"

In keeping with its policy to create public awareness and interest among school children and the general public, a series of seminars was conducted through the Steering Committee on Science Education on the central theme of "Science for Everyday Life". The objectives of this seminar series are to create general awareness of the usefulness of science and educate selected sectors of the population on the use of science and simple technologies to enrich life and living. These are short seminars of 2-3 hours duration and are conducted in Sinhala. During the year 1998, seven seminars were held in different districts on "Food and Nutrition" and "Landslides".

Food and Nutrition

- (a) 13 March 1998
- | | | |
|-------------------------|---|---|
| Venue | - | Zonal Education Office, Kuliyaipitiya |
| No. of Resource Persons | - | 04 |
| No. of Participants | - | 208 (Science and Home Science Teachers) |
- (b) 27 March 1998
- | | | |
|-------------------------|---|--|
| Venue | - | Kandangamuwa Maha Vidyalaya, Meerigama |
| No. of Resource Persons | - | 04 |
| No. of Participants | - | 203 (Teachers and Students) |
- (c) 23 August 1998
- | | | |
|-------------------------|---|--|
| Venue | - | Women Workers Education and Welfare Centre,
Dept .of Labour, Katunayake |
| No. of Resource Persons | - | 04 |
| No. of Participants | - | 145 (Young women workers) |
- (d) 08 September 1998
- | | | |
|-------------------------|---|---|
| Venue | - | National Youth Services Council, Maharagama |
| No. of Resource Persons | - | 04 |
| No. of Participants | - | 150 (Youth Trainees) |

Landslides

(a) 15 January 1998

Venue	-	Walhaputenna Maha Vidyalaya, Haldummulla
No. of Resource Persons	-	04
No. of Participants	-	400 (Students and Teachers)

(b) 16 January 1998

Venue	-	Koslanda Maha Vidyalaya
No. of Resource Persons	-	04
No. of Participants	-	250 (Students and Teachers)

(c) 18 December 1998

Venue	-	Divisional Secretariat, Eheliyagoda
No. of Resource Persons	-	04
No. of Participants	-	71 (Gramaseva Niladharis, Samurdhi Assistants)

Presentations based on Research Grants

A presentation was made by Mr. Shavi Fernando on 9th September, based on the findings of his project on "Energy efficiency in buildings". The presentation focussed on lighting in buildings, thermal comfort in buildings, and the building code. Representatives from SLSI, CEB, SLIA, UDA, NBRO and SLEMA participated.

Presentations by Invited Speakers

A lecture on "The advantages of an intellectual property system to the scientific community in Sri Lanka" was held on 17 July at the NSF. The speaker was Mr. Lee Yuke Chin, Director General, SIRIM Information Services, Malaysia. This lecture was attended by scientists and interested members of the public.

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Publications and Periodicals

Regular Publications

- ***Journal of the National Science Council***

Vol 26, No. 1 and 2 - printed and distributed.

The articles received for the supplement to mark the 25th year of publication of the JNSC, were processed. The Editorial Board decided that these articles as and when accepted, could be published as review papers in the normal volumes of the JNSC. This decision had to be taken since some articles covering vital areas of Science and Technology had not been submitted to enable the articles to be published as a supplement.

- ***Sri Lanka Journal of Social Sciences***

Volume 20 - printed and distributed.

Volume 21 - work was in progress.

Newsletters

Three issues of the NARESA/NSF Newsletter were published.

Vidurava - Science News Bulletin

The following issues were released, and copies circulated among schools having Advance Level Science classes.

- (i) Vol. 18(3/4) - Integrated Pest Management (English)
- (ii) Vol. 19 (1) - Indigenous Knowledge (Sinhala)
- (iii) Vol. 19(2) - Prof. Nandadasa Kodagoda - Commemoration (Sinhala)
- (iv) Vol. 19(2) - Prof. Nandadasa Kodagoda - Commemoration (English)

The following issues were under preparation, during the year

- (i) Vol. 19(1) - Indigenous Knowledge (English)
- (ii) Vol. 19(3) - Solar Energy (English and Sinhala)

Prof. Nandadasa Kodagoda Commemorative volume was formally presented to Mrs. Ratna Kodagoda by Prof. Kapila Dahanayaka, Chairman, NSF at a ceremony held at the NSF auditorium on 01 December 1998. This volume was brought out in appreciation of Prof. Kodagoda's services to science, medicine, arts and other fields.

Science Education Series

An advertisement was published in the newspapers inviting authors to submit manuscripts in the

field of Information Technology (IT) for publication in the above series. This series is directed primarily towards school children from Years 10-13 and the general public. Four manuscripts were received for consideration for publication.

Proceedings of Seminars

The proceedings of the Regional Seminar to commemorate UNESCO involvements in the Forests of the Humid Tropics in South and South East Asia held in Kandy from 19-22 March were copy edited and made ready for publication.

Natural Resources Series

- ***Natural Resources of Sri Lanka 2000 - Conditions and Trends***

A profile of the natural resources of the country was published by NARESA in 1991 titled Natural Resources of Sri Lanka- Conditions and Trends. It is in the process of revision incorporating the latest available information, to be released in the year 2000.

First drafts of the following eight manuscripts were processed during the year

- Population Profile
- Land Resources
- Mineral Resources
- Biological Diversity
- Inland Aquatic Resources
- Forest Resources
- Legal Framework
- Economic Conditions and Trends

- ***Water Resources of Sri Lanka***

The above manuscript was copy edited and made ready for publication.

Special Publications

- ***Master Copy of the Manual on Protected Fauna and Flora***

A special Committee was appointed by NARESA in 1997 to study the issue of Unauthorized Collection and Export of Fauna and Flora. One of the recommendations made by this Committee was to prepare a manual for the use of customs officials who are responsible for implementing the section 42 of the fauna and flora ordinance to help them with the identification of the species which are subject to removal and sale in violation of this ordinance.

During the year, expert scientists were identified and the preparation of samples for the manuals of the following groups were carried out.

- Fresh water fish
- Reptiles and Amphibians
- Angiosperms

- The book on **Common Vegetables of Sri Lanka** was printed and released

- ***Publications from NSF Grants***

A publication arising from the final report on “A method to forecast extreme weather systems over Sri Lanka during the inter monsoon period” (carried out by Mr. K.R. Abeysinghe Bandara of the Dept. of Meteorology) was sent to the following institutions/persons for their information; The Cabinet of Ministers, University Libraries, Libraries of Research Institutes, PGIA , PGIS, Parliament Library.

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Research Coordination Activities

Zoological Survey of Sri Lanka

- ◆ The Zoological Survey of Sri Lanka was revived in 1997 and a special Committee was appointed. The ZSSL was necessary in order to establish a permanent Zoological Survey of Sri Lanka for the purpose of taxonomic documentation and maintenance of a "Zoological Collection". With the current emphasis on Biodiversity this has become an urgent need for the country.

The Committee is in the process of organizing a major island wide survey of invertebrate fauna of the island using teams made of Zoologists, as well as school teachers and Advanced Level students. The latter group will be trained to serve as collectors in areas immediately around their schools and homes. This will also help to create awareness. The primary objective is to set up a National Zoological collection and the nucleus of a National Data Base. The long term objective is to set up a permanent institute for the Zoological Survey, under the Government.

As a first step, an integrated ecosystem study of the Horton Plains was conducted by a multidisciplinary team of senior scientists. A report on this study is under preparation. Specific projects to assess the status and distribution of selected species are planned.

NSF advertised for Zoologists to join in a major national effort to study, identify and document species belonging to various groups of fauna. Taxonomy, distribution and status assessments of these groups will be studied.

- ◆ On the recommendation of the Committee on ZSSL, NSF purchased a very valuable collection of sea shells of Sri Lanka. This was previously owned by the late Rodney Jonklaas, a marine biologist. This collection has been indexed and a computerized data base is being prepared. Once the data base is completed their collection will be handed over to the National Museum where it will be accessible to the general public. This will form part of the National Zoological collection.
- ◆ Under the programme of ZSSL, four grants were awarded in 1998, with a total allocation of Rs. 719,238/= for 1998. The details are given in Annexures.

Man and the Biosphere Programme

- ◆ *MAB Occasional Papers*

The Man and the Biosphere National Committee commenced publishing available authentic unpublished data on Sri Lanka's Biodiversity. The first in this series was on Plant based Antimalarials of the Indigenous Herbal Traditions of Sri Lanka by Prof. J.S. Edirisinghe of the Department of Parasitology, University of Peradeniya. This manuscript was copy edited and made ready for printing.

◆ ***Valuable Ecosystems for Conservation as MAB reserves***

The Man and the Biosphere Committee in collaboration with experts in NARA recommended to the Department of Wildlife, that five different coastal wetland ecosystems (Bar Reef: Puttalam lagoon and Kala Oya estuary; Madu Ganga; Unawatuna and Rumassala Great and Little Besses reefs.) be designated as sanctuaries considering their biodiversity. It was also recommended that Bolgoda Lake and its environs be designated as a sanctuary.

◆ ***Information on the Application of ISO 14000 series of International Environmental Management Standards to the Issue of Global Climate***

The comments received from the members of the National Man and the Biosphere Committee on the above were sent to the Director, Sri Lanka Standards Institution for information.

◆ ***Proposed Amendments to the Fauna and Flora Ordinance***

The National Man and the Biosphere Committee discussed the proposed amendments to the Fauna and Flora Protection Ordinance. The comments of the members along with general comments were sent to the Department of Wildlife Conservation for consideration when finalising the document.

◆ ***Visit to a Marshy Forest at Bulathsinhala***

The MAB Committee visited the Walauwatta Swamp Forest on 21 March 1998. The aim of the trip was to study the forest and its composition. After a preliminary study the Committee felt that a detailed study of this lowland rain forest should be carried out in collaboration with CEA with a view to preserve the forest considering its unique habitats. Various aspects including legal aspects to maintain the integrity of the natural forest in the national interest were discussed.

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International Scientific Activities

SIDA Programme - Research Cooperation between Sri Lanka and Sweden

• *Buffalo Information Dissemination Project*

- The field programme on population of buffalo farming under the buffalo information dissemination programme was concluded during the early months of the year. During this period, the intensive/semi-intensive buffalo farming system was introduced to the 14 farmer units at Girandurukotte with the assistance of the Livestock Development Division of the Mahaweli Authority.
- The programme then focussed on publishing the reports based on the experience gained through the project. The following booklets were printed at NSF for distribution among farmers, Veterinary Surgeons and Undergraduate/postgraduate students. The publications were in Sinhala & English.
 - Health and diseases of buffaloes and cattle
 - Breeding of buffaloes and cattle
 - Reproduction in buffaloes and cattle
 - Body condition scoring system for assessing the nutritional status of buffaloes
 - Fibrous feeds and their utilization
 - Urea-molasses, mineral multi-nutrient feed supplement
 - Management of buffalo and dairy cattle.
 - Feed formulation for cattle and buffaloes
 - Crop-livestock integration for maximizing small holder farm income
 - Use of tree fodder in ruminant feeding
- The publication on the "Water Buffalo Improved utilization through new technologies" was completed. This publication is available for sale at Rs 200/= per copy.
- Report on the "Review of the Buffalo Research Programme" written by Dr M.C.L. de Alwis was published. The report highlights the achievements, findings and constraints of the Buffalo Research Programme funded by SAREC. The report describes all the aspects of research on buffaloes under the SAREC/NARESA water buffalo research programme. The outcome of the programme in terms of capacity building, manpower development and research publications were also highlighted in the report. 30 copies of the publication on "Buffalo Research in Sri Lanka" have been circulated as complimentary copies among the relevant authorities and individuals. Five copies have been sent to SIDA. Copies are available for sale at the NSF at Rs. 150/= per copy.
- A "Training manual for veterinary extension officers" was printed.

- ***Coastal Ecology Programme***

A new Committee was appointed in August 1998 to monitor the Coastal Ecology programme. The Committee focused its attention on the ongoing projects. The Committee felt that the output of the current research activities can be improved, and decided to hold a seminar to present the work done by researchers with a view to suggesting improvements. The seminar will be held in 1999.

Apart from the base line studies on the fisheries, environmental aspects and studies on water resources in the Negombo Lagoon, video filming on Hikkaduwa coral reefs have been done (with a view to monitor the reef).

- ***International Contacts Fund***

Eighty Five travel grants were approved under the SIDA funded International Contacts Fund, for local scientists to present their research findings at international seminars and workshops.

Five follow up public seminars were held for some of the recipients of these travel grants, to share their experiences with others.

Date/Theme of International Events	Participant	Date/Theme of the Public Seminar
26-29 March 1998 Water Environment Federation - Asian Conference, Singapore	Dr. S. Bhuvendralingam Dept. of Civil Engineering Univ. of Peradeniya	23 July 1998 - Water quality Management
02-06 March 1998 First International Specialized Conference on Water Quality Management, New Delhi	Prof. N. Ratnayake Dept. of Civil Engineering Univ. of Moratuwa	23 July 1998 Water Quality Management
11-14 January 1998 20 th Annual Pacific Telecommunications Conference, Hawaii	Mr. A.D.V.N Kularatne Arthur C Clarke Centre	30 July 1998 Opening Up Telecommunications in Sri Lanka
18-23 May 1997 5 th International Symposium on Poisonous Plants, USA	Prof. V.K. Gunawardene Fac. of Veterinary Sciences Univ. of Peradeniya	21 October 1998 Veterinary Research
28-June -04 July 1998 08 th World Conference on Animal Production, Korea	Dr. A.D.N. Chandrasiri Veterinary Research Institute	21 October 1998 Veterinary Research

- ***Urgent Spare Parts Fund***

Twelve requests for spare parts from Research Institutes and Universities in excess of US \$ 20,000 were forwarded to Sweden.

- ***Visit by SIDA Delegation***

My Rolf Carlman and Dr. Afzal Sher from SIDA visited Sri Lanka from 6-14 October 1998. The purpose of the visit was to review the progress of the ongoing research projects and to initiate discussions on the new projects to be considered under the 1999 - 2001 agreement period.

Commonwealth Science Council (CSC)

- ***Travel Grants Scheme***

The purpose of this travel grant scheme is to help scientists from member countries of the Commonwealth Science Council to attend international conferences, major meetings and short technical in - service training courses. Grants cover the actual costs of the return airfare and registration upto a total of £1000.

During the year 1998, thirty applications were received and processed.

- ***Workshops***

Information on the following workshops sponsored by CSC were circulated to institutions and nominations were forwarded to the CSC.

- * Training workshop on "Low cost instrumentation for environment monitoring (CREN)", Bangalore, 9-14 March '98.
- * Training workshop on "Monitoring of heavy metals, pesticides, PCBs, dyes and pigments", Islamabad, 17-21 May '98
- * Training workshop on "Ground water modelling", Islamabad, 20 April - 2 May '98.

- ***Fellowship Scheme***

Three applications were received and processed during the year.

- ***CSC Advisory Group on Biodiversity and Genetic Resources***

On a request made by the CSC, Mr. L.C.A. de S. Wijesinghe, Chairman of the Man and the Biosphere National Committee was nominated as an expert from Sri Lanka to serve as a member of the Advisory Group on Biodiversity and Genetic Resources.

South Asian Association for Regional Cooperation (SAARC)

A meeting of the Sectoral Focal Points coordinating activities of the SAARC Technical

Committees was held on 26-02-1998 at the Foreign Ministry. Dr. Thamara F. Dias attended the meeting representing the nodal point (NARESA) for SAARC Technical Committee on Science and Technology. The objective of the meeting was to ascertain views on the functioning of the SAARC Technical Committees and review the Integrated Programme of Action (IPA).

The following Communications were sent to the Ministry of Science and Technology.

- * Items for inclusion in the declaration of the SAARC Summit, Colombo, July 1998
 - i. Paper on regional cooperation in Biotechnology
 - ii. Paper on regional cooperation in Intellectual Property Rights
- * Country input for the preparation of the SAARC State-of-the-Art Report on biotechnology was prepared and forwarded to the Ministry of Science and Technology for onward transmission to the SAARC Secretariat.

Indo-Sri Lanka Science and Technology Cooperation - Biotechnology Programme

- Out of the project proposals (8) discussed at the Indo-Sri Lanka joint workshop held on 30-31 January 1997 in New Delhi, two project proposals were finalised and accepted for funding as collaborative research projects.

- (1) Title : Non-cellulosic polysaccharides of lesser known millets and grain legumes and their physiological effects

Principal Investigator: Dr(Ms) Jaanaki Gooneratne
ITI

- (2) Title : Use of molecular and cytotaxonomic techniques to study the *A culicifacies* species complex and its relationship to malaria transmission in India and Sri Lanka

Principal Investigator: Dr(Mrs) Manthri S. Ramasamy
IFS

The approved funds by both governments

Project No.	India (I Rs.)	Sri Lanka (SL Rs.)
1.	2,192,000.00	2,908,500.00
2.	400,000.00	900,000.00

- Preliminary estimates for projects for 1999-2000 under this programme were submitted to the Ministry of Science & Technology.

International Centre for Genetic Engineering and Biotechnology

ICGEB is an international, intergovernmental organization conceived as a Centre of Excellence for research and training in genetic engineering and biotechnology with special attention to the needs of the developing world. Sri Lanka is a full member of this organization and the NSF is the National Scientific focal Point.

Prof. S. Widanapathirana, Dept. of Microbiology, Faculty of Science, University of Kelaniya, as the Chairman of the Working Committee on Biotechnology is designated as the Appointed Governor for ICGEB. He attended the third session of the ICGEB Board of Governors held held from 28 -30 September 1998 in Trieste, Italy.

Information with respect to the ICGEB Programme (Predoctoral, Postdoctoral, Meetings, Courses, Workshops and Symposia) were distributed among the Universities and Research Institutions.

Visits of Foreign Delegates

- 21-23 January - Mr. N.R. Subbaram, Former Head, Intellectual Property Management Division, CSIR, India
- 04-05 March - Dr. R.K. Bhandari, Head, CSIR India
- 15-24 March - Mr. Fred Naggs, Curator, British Museum of Natural History

Nominations for Workshops

Nominations for an International Demonstration/Training Workshop on "Fibre Reinforced Composites", held from 15 - 19 September 1998, Bangalore, India were invited and two nominations were forwarded to COSTED (Committee on Science and Technology in Developing Countries).

Information on a USIU - COSTED training programme on Technology Management, 31 August to 5 September 1998, Madras, India was disseminated to relevant institutes.

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Other Activities

S & T Indicators Unit

- ***Database on Ongoing Research***

The Directory on the Database on Ongoing Research was published and circulated among research organizations and Universities with a request to update the information for 1998.

- ***National Survey on R & D 1996***

The report on "National Survey on R & D 1996" was published. The report contains information on S & T Personnel, R & D expenditure and publications for 1996 and compares the status with 1984. Complimentary copies have been circulated. (Universities, Research Institutions, Relevant Ministries, NASTEC and the board of NSF). Copies are available for sale at NSF at Rs 200/- per copy.

- ***S & T Personnel (STP) database***

The co-operation of the NIBM was obtained for the conversion of the database of STP into a Windows environment with a view to inclusion in online retrieval services.

- ***Ongoing Surveys***

Data collection on S & T personnel, Equipment and ongoing projects for 1998 was commenced. Field visits were carried out to gather information from research institutes and Universities.

- A consultant Mrs. C. Fernando, was appointed to advise on data analysis and reporting on S & T Manpower.

- Manuscript of the handbook on S&T Indicators 1999 was submitted for printing

- At the request of the Ministry of S&T, arrangements have been made to create a database on experts on "Management of Technology". A newspaper advertisement was inserted. The relevant organisations were also contacted with a view to collect data.

Participation in Exhibitions

- ◆ ***Golden Jubilee Exhibition - to mark the 50th Anniversary of Independence of Sri Lanka***

NARESA organised a stall at the above exhibition held from 05-25 February 1998 at BMICH, and the following exhibits were displayed.

- A display stand on NARESA activities in 03 languages

- **Models on NARESA funded projects**
 - * Awareness of Lightening hazards
 - * Buffalo farming
 - * Low-cost colorimeter
 - * Underground structure of the earth of a hot spring
 - * Studies on ornamental fresh water fish
 - * Solar Energy Collector for tea drying
 - * Biogas from vegetable garbage to produce electricity
 - * Charcoal stove
- 14 posters on NARESA funded research projects
- The progress of the NARESA Research Grant Scheme
- Science and Technology information via Internet
- NARESA publications (were made available for sale)
- On the Ministry day held on the 16 February 1998 the following two publications were presented to the Minister of Science & Technology, Hon. Batty Weerakoon by the Director General, NARESA
 1. "A method to forecast extreme weather systems over Sri Lanka during winter monsoon period." by Mr. K.R. Abhayasinghe Bandara
 2. "Population and Manpower Resources of Sri Lanka" by Dr. A.T.P.L. Abeykoon.
- The News bulletin "Vidurava" was presented to 75 members of school bands (who participated in the cultural show), by the Hon. Minister of Science and Technology.

◆ ***Exhibition on Technical and Energy Conservation***

A three - day exhibition on Technical and Energy Conservation was held from 26 - 28 November 1998 at the Galle Town Hall. The NSF organized a stall at this exhibition. Posters on energy - related research projects funded by the NSF, publications of the NSF and models on effects of lighting and solar tea drying process were exhibited. The exhibition was organised by the Technical Club Foundation and was open to students, teachers and the general public. The Mayor of the Galle Municipal Council and Mr. A.W.J. Karunasinghe, Scientific Officer of the NSF inaugurated the exhibition on the 26th and 28th November respectively.

◆ ***Exhibition - SLAAS Annual Sessions***

The NSF organized a stall at the SLAAS exhibition held from 15 - 18th December at the University of Sri Jayawardenepura. NSF publications, models on the effects of lightning, solar tea dryin process and biogas from vegetable garbage for electricity, and posters based on NSF funded research projects were among the exhibits. Information retrieval through Internet was also available for the visitors of the NSF stall.

◆ ***Participation in Parliament Consultative Committee Meetings***

NSF officials participated in five Parliament Consultative Committee meetings held at the Parliament on 05-03-1998, 22-04-1998, 11-06-1998, 23-07-1998 and 20-10-1998. At these meetings, the Annual Reports and the performance of scientific institutions under the Ministry of Science and Technology were discussed.

NSF Studentships and Internships

- ◆ A scheme of studentships and internships was started to support research training of young scientists. Studentships will be awarded to scientists registered at the Postgraduate Institute of Agriculture (PGIA) and the Postgraduate Institute of Science (PGIS), Peradeniya for MPhil/PhD degrees. Internships will be awarded to scientists for attachment to research institutions on a specific project. This serves to strengthen local research capacity at postgraduate level, while helping deserving scientists in career advancement. The scheme provides for the stipend of the student/intern for two years.

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Sri Lanka Scientific and Technical Information Centre

The Sri Lanka Science and Technology Information Centre was established in 1979 and was identified as the national focal point of information networks on Science and Technology. During the year 1998, the SLSTIC engaged in the following activities:

Collection development of the NSF library

During the year 153 books, 526 Journals, 472 Newsletters, 54 Annual Reports, 14 Final Reports, 29 Bibliographies, 56 Acts & bills, 143 Reports, 28 Gazettes, 9 CD-Roms were added to the NSF library.

Database development

The establishment of the computerised Local Area Network in 1996, provided the facility of data base development at SLSTIC. Since then many data bases were developed and during 1998 the existing data bases were strengthened with the addition of new records; 559 to Sri Lanka Science Index, 63 to Research Grants database, and 872 to SLSTIC catalogue. In addition, a new database on Current List of Serials available in S & T libraries in Sri Lanka (CLIST) was developed comprising 4648 records. This database was published as a book and is available at the NSF for sale Rs. 150/= per copy.

CDS/ISIS distribution and training

Since NSF is the national distributor of the CDS/ISIS software developed by UNESCO, SLSTIC has played a major role in providing training programmes on this software. Accordingly during 1998 Dos and Windows versions were distributed to 26 and 85 Institutions respectively. The Integrated system (PURNA) was distributed to 24 libraries while 25 library personnel received training on this package. SLSTIC also was engaged in providing Pascal programmes which supported this soft ware. The Course on Library Automation conducted by the SLLA was held at NSF and training facilities were provided for this.

Training & awareness programmes on Internet, CD-ROMS, Databases

Many training programmes were held on retrieval of information through Internet, CD-ROMS and databases. The participants at these training programmes included approximately 200 from the scientific community and 250 information mangers.

SLSTIC also participated in the following exhibitions

- * Golden jubilee Independence Exhibition, BMICH (05-25 February)
- * Book Exhibition, British Council (23 - 25 April)
- * SLAAS Annual sessions at Sri Jayawardenepura University (15-18 December)

Special Events

An exhibition on "Resources and Services available at the S&T Libraries in Sri Lanka" was held at the NSF from 1-2 December 1998. The exhibition was inaugurated by Hon. Batty Weerakoon, Minister of Science and Technology. The objectives of this exhibition was to;

- Create an awareness among the general public and the scientific community on the resources and services available at S & T libraries and information centres
- Promote co-operation among libraries
- Introduce IT, and provide a forum to demonstrate and explain how to utilize these technologies in information management

The inauguration ceremony was attended by a large gathering of distinguished academics and library professionals. The updated issue of the Union List of Current Periodicals in S & T libraries in Sri Lanka was released at the exhibition.

A theme seminar on "Sharing Information for a Networked society" was also held as a part of this exhibition.

SIDA project on S & T Information:

The Local Area Network was enhanced with the following:

- All the Computers in the LAN were upgraded
- Four telephone lines were acquired to provide remote access for the S & T Institutions to Internet and databases
- CD-ROMs were continuously updated
- The following Web sites were developed in addition to the ones already developed
 - Geological Survey and Mines Bureau of Sri Lanka (GSMB)
 - Sri Lanka Association for the Advancement of Science (SLAAS)
 - Institute of Chemistry (I.Chem.C)
- Coordinated the ADB project on providing Internet access to ITI and NERD
- Preliminary discussions were held to extend the local area network along Vidya Mawatha to provide access to other S & T Institutes around NSF.

Activities of the Staff

Participation in Conferences, Seminars and Workshops

(1) Prof. Priyani E. Soysa, Chairperson (up to September 1998)

- 29 January - Lecture delivered on "Current Concepts on Infant Feeding" - PGIM
- 10 February - Chief Guest at the workshop on "Renewable energy Sources" -SLAAS
- 24 February - Presidential Task Force on "Integrated Research and Development Programme in Science and Technology"- Discussion with H.E. The President on the Interim Report of the Task Force - Temple Trees
- 03 March - Working Group meeting on "Vitamin A Deficiency and other Micro-nutrient Deficiencies - MRI
- 25 April - Extraordinary Session of the General Assembly of International Council of Scientific Unions - Vienna, Austria
- 28 May - Children's Rights Monitoring Committee meeting - Sethsiripaya
- 16-17 June - STEPAN International Workshop and Advisory Board meeting - Science and Technology Policy for Asia - Pacific Economics in the 21st Century - Hanoi, Vietnam
- 25-26 June - Second Global Forum on Health Research - Geneva, Switzerland
- 21 August - Discussion on "Eradication of Polio myelites"- India

(2) Mrs S.P. Prelis, Director (upto October 1998)

- 25-26 May - National Workshop on "Education for All-Education for Sustainability" - Hotel Intercontinental

(3) Prof. Kapila Dahanayaka, Chairman(from September 1998)

- 15 October - Delivered a talk at the workshop on "Disaster Management for School Children of Central Province" - Mahamaya College, Kandy
- 07 November - International Conference on "50 years of Independence" - University of Peradeniya

- 19-24 Nov. - Humboldt Colloquium, Presented a paper on "Living with Landslides - a geological view point" - Hyderabad, India
- 09 December - Participated and chaired the Panel Discussion on "Recent Earth Tremor in Kandy"- NSF, Colombo

(4) Mr. M. Watson, Acting Director (from October 1998)

- 22-25 February- South and South East Asia Regional Workshop on "Access to Genetic Resources and Traditional Knowledge" - M.S. Swaminthan Research Foundation, Chennai, India
- 22 May - National Action Plan an Climate Change - Hotel Galadari
- 25-26 May - National Workshop on "Education for All-Education for Sustainability" - Hotel Intercontinental
- 04 July - Presented a paper at the Panel Discussion on "Trade Related Intellectual Property Rights (TRIPS)" - Centre for Society and Religion.
- 06 August - National Policy and Action Plan for the Conservation and Sustainable Use of Coastal, Marine and Wetlands Biodiversity, - Rohan's Indian Cuisine
- 03 September - Research Management - NSF
- 14 September - Workshop for Core Teams for Developing a National Action Plan on Climate Change - Hotel Galadari
- 22 September - National Policy and Action Plan for Conservation and Sustainable Use of Agricultural Biodiversity - PGRC, Peradeniya

(5) Staff Members

Foreign:

- 02 - 06 June - Conference on "Gateway to Electronic Library", Lund, Sweden - Mrs. D Talagala.
- 07- 12 June - CSC Training Workshop on Monitoring and Management of Heavy Metals, Pesticides, PCBs, Dyes and Pigments", Islamabad, Pakistan - Ms. H.A.U. Amarasinghe (was assigned the administrative and organizational aspects of the workshop together with scientific and technical support for the CSC).
- 01 - 25 July - "Basic Course for Library Assistants", Malaysia - Mr. J.S.K. Weerawardana.

15 - 17 November - "49th FID (International Federation for Documentation) Conference", New Delhi, India - Mrs. D. Talagala

Local

08 -09 June - Training Programme on "Management of Technology", University of Moratuwa - Mr. W. Amaradasa.

30 June - "Globalization and Agriculture: Issues, Challenges and Opportunities", SLAAS - Ms. R. Wijyaratne, Ms. S. Wickramasinghe.

04 July - Panel Discussion on "Trade Related Intellectual Property Rights", Centre for Society and Religion - Dr(Ms) T. Dias.

10 - 11 September - Workshop on "Role of the Research and Development Institutions in Urban Disaster Management in Sri Lanka", Ministry of Housing and Urban Development - Ms H.A.U. Aamarasinghe (Served on the organizing Committee)

23 - 24 November - Seminar on "Agricultural Research Management", PGIA - Mrs. S.I. Wickremasinghe, Mrs. R. Wijyaratne.

Staff Training

19 May-20 June - Workshop on "Stated Alone Rural Electrification", Univ of Twente, Netherlands - Dr. S. Fernando.

01 - 30 December - "Internship Programme on Science Policy and Research Management", University of Wollongong, Australia - Mr. W. Amaradasa, Ms. V.N. Perera.

13 -17 July - Training course on "Intellectual Property Law and Practice for Developing Countries of Asia and the Pacific", SLFI Colombo - Dr(Ms)T. Dias.

June 1998 - Training programme on MS - Access, National Institute of Business Management - Mr. W. Amaradasa, Ms. C.G. Yapa. Ms. R. Wijyaratne and Ms. A. Wijyanthi.

Participation in Committees by Staff members.

- Forestry Sector Research Committee - Mr. M. Watson
- ADB Science and Technology Personnel Development Project, Project Technical Advisory Committee - Mr. M. Watson

- ADB Science and Technology Personnel development Project, IPCU Coordinators Meeting - Mr. M. Watson
- Working Group on Policy Measures for a National Action Plan on Climate Change - Mr. M. Watson
- IPR Committee, Medicinal Plants Project - Mr. M. Watson
- Technical Evaluation Committee, Medicinal Plants Project - Mr. M. Watson
- LEARN Management Committee - Mrs. D. Talagala
- Editorial and Publicity Committee of the Institute of Chemistry - Mrs. C.G. Yapa

Staff Publications:

1. Amaradasa W. (1998). Some characteristics of research collaboration in the National Research System. Proceedings of the Sri Lanka Association for the Advancement of Science, Colombo.
2. Amaradasa W. & Perera N. (1998). Some statistics on ongoing research projects in Sri Lanka. Proceedings of the Sri Lanka Association for the Advancement of Science, Colombo.
3. Amaradasa W. & Perera N. (1998). Directory on the Database on Ongoing Research. NARESA, Colombo.
4. De Silva M.A.T., Yapa C.G. & Karunasinghe A.W.J. (1996). Science and Technology Indicators - Part IV: Constraints and Opportunities for Scientific Research in Sri Lanka (in print)
5. Fernando C. & Amaradasa W (1996). National Survey of Research & Development. NARESA, Colombo
6. Jayasinghe S. & Yapa C.G.(1998). Research in the field of Medical Sciences - *Journal of the National Science Council*, 26(4) (in print)
7. Prelis S.P.(1998) International Cooperation in Science and Technology - *Journal of the National Science Council* 26(4) (in print)
8. Watson M. (1998) A review of the MAB Programme in Sri Lanka - *Journal of the National Science Council* 26(3): 163 - 183

Staff Achievements

Mr. A.W.J. Karunasinghe, Scientific Officer was awarded the degree of Master of Philosophy by the University of Colombo. This research work was carried out under grant RG/89/C/9 titled "Ambient air quality study of the pollution caused by vehicular exhaust emissions" awarded to Dr. J.A.P. Mathes of CISIR and Prof. H.D. Gunawardhana of Dept. of Chemistry, Univ. of Colombo.

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Awards for Work of Scientific Excellence

National Awards for Scientific Achievements (NASA)

The National Awards for Scientific Achievements are made every three years for up to two achievements. These awards are in recognition of outstanding achievements in scientific research or development, considered on the basis of their originality and intrinsic merits. The awards are given also for work, the importance of which lies in its potential application in Sri Lanka.

The first prize named the Presidents's Award for Scientific Achievements constitute and award valued at Rs. 100,000/= and a certificate.

The second prize named The Natural Resources, Energy & Science Authority's award for Scientific Achievements constitutes an award valued at Rs. 50,000/= and a certificate. Entries are accepted only from citizens or institutions in Sri Lanka for work done in Sri Lanka.

For the awards in 1998, applications were called by advertisement in the newspapers. A special Panel of Judges was appointed by the Board of NARESA, for the evaluation of applications.

The winners for 1998,

Presidents' Award

Prof. Nimal Senanayake, Faculty of Medicine, University of Peradeniya and **Dr. Lakshman Karaliedde**, Associate Professor and Head Department of Anaesthesiology, University of Peradeniya, for their work titled, "Studies on Organophosphorus Insecticide Poisoning"

NARESA Award

No selection made.

The presentation ceremony was held on 18 March 1998 at the Presidential Secretariat. The awards were presented by H.E. the President. The distinguished gathering included Hon. A. Ratwatte, Hon. Batty Weerakon, Hon. D.M. Jayaratna, eminent scientists and academics and representatives from the press.

Soba Cineru(SOTV) National Environmental Award of SLEJF - Sri Lanka

The project on Biological Control of *Salvinia*, a project coordinated by NARESA, was selected as one of the 20 best environmental projects conducted in Sri Lanka during the period 1986-1995 by Sri Lanka Environmental Journalists Forum(SLEJF) for the above award. The project was also featured in 2 Sinhala and English publications as one of 20 environmental stories.

The names of publications are

- (1) Sinhala - "hiru udakala minissu"
- (2) English - "the vision and the mission of the Environment"

A video film including the project on Salvinia was also prepared. A certificate was awarded to NSF by Hon. N. Nandimitra Ekanayake, Minister of Forestry and Environment at a ceremony at Sausiripaya on 06 March 1998.

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Research Findings of Importance

Given below are summaries of some of the completed grants during the year 1998. The reports are available in the library for reference. The results could also be made available for commercialization, where appropriate.

● **Insecticide resistance in Anopheline vectors of malaria**

The overall aim of the above project was to obtain baseline information on pesticide resistance levels and mechanisms of a malaria vector population/s where they have been exposed to insecticides for a long period of time.

The following conclusions were made based on this study.

- The two species of mosquitoes *An. culicifacies* and *An. subpictus* are carriers of *P. falciparum*, *P. vivax* and *P. vivax* polymorph Pv247 malarial parasites. The occurrence of *P. vivax* polymorph Pv247 in vector mosquitoes (*An. culicifacies* and *An. subpictus*) is recorded for the first time in Sri Lanka. The incidence of human malaria cases, throughout the period of study shows that these vectors were capable of transmitting the parasites in the field to humans.
- While the seasonality and the abundance of vectors could have been affected by many parameters that were not monitored during this study, the consistent use of larvicide in the river-bed pools could have had an effect on the overall abundance of *An. culicifacies*. This was reflected in the reduction in *An. culicifacies*, in hut collections as well as the house collections, after application of larvicide.
- The application of larvicide may not have had an effect on the overall *An. subpictus* abundance, as river-bed pools are not their primary breeding site.
- In general, malaria parasite transmission and maintenance occurred utilising more than one vector species, throughout the year, even with trickle populations of vector species.
- Although the use of DDT vector control programmes has been abandoned, high resistance to DDT is still maintained in both populations, through the mechanisms selected with the insecticides used since then.
- Both populations show broad-spectrum organophosphate resistance mainly as a result of elevated carboxylesterase and Malathion carboxylesterase mechanisms.
- Resistance to carbamates is very low in both populations. This shows that the impact of pesticides used in agriculture, where carbamates have been used heavily, has not been significant in the development of resistance in these two vectors. Carbamates can be used successfully in malaria vector control programmes.

(RG/95/B/06, Dr. S.H.P.P. Karunaratne)

- **Characterization of *Anopheles culicifacies* complex of Sri Lanka; Identification of sibling species using DNA probes**

Anopheles culicifacies is the best known vector of malaria in Sri Lanka. The taxon *Anopheles culicifacies* exists as an isomorphic species complex comprising of four reproductively isolated populations designated as A,B,C, and D. The four species have been found to be different in their pattern of distribution, behaviour, and in vector competency, and therefore may play a different role in malaria transmission. Precise identification of members within a taxon is thus essential for the successful implementation of vector control programmes. The current cytotaxonomic methods of identification of sibling species of *An. culicifacies* complex are tedious and are sex and life cycle stage specific. Therefore, a large number of samples cannot be identified due to unsuitable preparations. The use of DNA probes is an alternative novel approach for vector technique.

The probes developed in this study enable the rapid detection of all life cycle stages of *An. culicifacies* from other mosquito species, as well as the detection of *An. culicifacies* sibling species A from B and C sibling species in the field. Field investigations using these DNA probes revealed the absence of *An. culicifacies* sibling species A in Sri Lanka. The probes Rp36 and Rp217 have been completely sequenced.

(RG/93/BT/02 - Dr. Maya Gunasekera)

- **A study on histamine production in fish and dried-fish and dried-fish and the effect of processing on histamine.**

Histamine is an allergic amine produced during microbial spoilage of fish. This study examined the histamine concentrations of the market fish and fish products, followed the histamine formation during processing of dried-fish, isolated and identified histamine producing bacteria from fish products and examined sources inhibiting their growth. Processing methods to destroy histamine in fish and a simple method to estimate histamine in fish were also established.

Market samples of fish and fish products require regular monitoring for histamine. Clearing fresh fish minimized formation of histamine during production of dried-fish and Maldiva fish. Histamine in fish reduced on cooking with extracts of "goraka" and was partly destroyed on frying in oil or cooking in extracts of "Kathurmurunga" and "murunga". Histamine production by bacteria in synthetic media could be suppressed with ZLS, (Zest Liquid Smoke) salt or at temperatures below 10 °C. The new spectrophotometric method is available to estimate histamine in fish.

(RG/95/BT/10 - Prof. U. Samarajeewa)

- **Preparation of a comprehensive database on selected industrially important medicinal and aromatic plants in Sri Lanka.**

This is a comprehensive reference source for both researchers and industrialists with information pertaining to all known aspects of the following selected plants.

Centella asiatica (Gotukola)

Aerva lanata (Polpala)

Piper longum (Tippili)
Cardiospermum halicacabum (Wel Panala)
Withania somnifera (Ashwadandha)
Phyllanthus debilis (Pitawakka)
Murraya konigii (Karapincha)
Momordica charantia (Karawila)
Cymbopogon nardus (Citronella)
Cymbopogon citratus (Lemon grass)
Mentha Sp. (Mint)

(RG/IS/96/01 - Mrs. Dilmani Warnasuriya)

- **Development of a teaching method on environment pollution for tertiary level education**

Ten universities in Sri Lanka including national, affiliated and open were surveyed to understand the structures of available programmes on environmental education at tertiary level. Information was gathered through letters and interviews during the years 1996 and 1997. It was found that the existing environmental education programmes are inadequate as 60% of the programmes have been designed without a practical component. Majority of the students do not follow these programmes as they are optional. The study has revealed that the present system needs to be restructured. A new strategy is proposed. It is called the concept of 3A 's - awareness, attitude, ability, and 3R's - reduce, recycle, render. This is a way of integrating general knowledge with the environmental and industrial aspects. These facts could be introduced to students within the classroom and the chemistry practical programme of the laboratory.

Results show that the following materials mentioned below are very important to uplift the awareness on cleaner environment . - general laboratory guidelines, leaflets on safety symbols and safe practise. Computer databases on chemical industries such as textiles, rubber, leather, sugar, iron & steel, tea, ceramic, glass and water purification were prepared and are available as reference materials for students.

A modified arrangement of chemicals and glassware in a teaching laboratory has been proposed. Under the arrangement, reagent bottles will be replaced with a clean set of glassware. This will result in the reduction of cost for chemicals and minimise waste generation for a cleaner environmental condition. Introduction of the modified experiments could result in the reduction of the scale of the chemical reactions and rendering waste, environmentally acceptable for disposal.

(RG/95/SE/02 - Dr. S.A. Fernando)

- **The effectiveness of a new restorative material used in out- reach dental clinics in Sri Lanka**

The aim of this study was to test the effectiveness of the use of Glass Ionomer Cement (GIC) in out-reach dental clinics. Study design was the comparative longitudinal evaluation of the two restorative procedures.

Three School Dental Therapists (SDTT) were randomly selected according to their working

experience and they were given a training for the use of GIC. Following this, they were instructed to conduct out-reach clinics. One group of children were treated with GIC and the other group was treated with Amalgam. These treated children were followed up for a period of six months, and re-examinations were made in one, three and six monthly intervals. The quality, the durability, the occurrence of post-operative complications of these restorations and the work output of two restorative interventions were taken as measurements. Moreover, the cost for restorations, the assessment of logistic difficulties and the fulfillment of the operators expectations by the use of GIC were used as indicators to test the effectiveness.

SDTT were able to place GIC restorations as similar as Amalgam restorations in terms of the quality, the durability, and the absence of post-operative complications. Further, with the use of GIC, they were able to produce more work out-put than the use of Amalgam. Accordingly, GIC seems to be the more efficient restoration and it was cost effective material. The cost for a GIC filling was lower than that of an Amalgam restoration it was cost effective too. Moreover, there were no apparent logistic difficulties concerning the introduction of GIC in out-reach dental clinics. Furthermore, GIC seems to fulfill the SDTT's expectations as a new restorative material.

Thus, the use of GIC in out-reach dental clinics seems to be the more effective method of provision of restorative care rather than the use of Amalgam. Moreover, with the other advantages of the GIC, its introduction to school dental service would be a better strategy for the provision of restorative care.

(RG/98/D/01 - Dr. U.S.:Usgoda Arachchi)

- **Epidemiological study and control strategy of Gastro Intestinal parasites in goats**

Gastrointestinal nematode infection is recognised as one of the major constraints in the development of the goat industry in Sri Lanka, particularly in the dry and intermediate zones of the country where over 65 percent of the total goat population is distributed.

The present study has shown that moderate to high gastrointestinal nematode infection can occur in the goats managed communally in the dry zone of Sri Lanka. This emphasises the necessity of employing control measures against gastrointestinal nematode infection in the dry zone. Extensively managed goat herds which very often share the communal grazing lands, show quite similar infection patterns. The findings also suggest that gastrointestinal nematode infection is related to the rainfall.

Furthermore, the effectiveness of three commercially available anthelmintics belonging to benzimidazole and imidathiazole classes were evaluated in goats in order to select the most cost effective anthelmintic for a chemoprophylactic programme. All anthelmintics tested were equally effective, but pyrantel pamoate was found to be the most cost effective.

(RG/95/V/03 - Dr. R.P.V.J. Rajapakse, Dr. N.U. Horadagoda, Dr. A.C.M. Faizal)

- **Nosocomial infections in the Intensive Care Unit and the Dialysis Unit - General Hospital Colombo.**

This study was an effort to provide a database on nosocomial infections in the Intensive Care

Dialysis Units. The risk of developing peritonitis is far too high for this simple and life saving procedure. The service of the microbiology laboratory is invaluable in identifying the organisms and to ascertain antibiotic sensitivity patterns. Surveillance of key organisms is essential to identify the source of infection, mode of spread and the extent of resistant strains. Facilities should be available to identify organisms to the species level and in certain situations even to the level of typing them. Dialysis unit should be regarded as a high risk unit and strict policies in infection control should be implemented. Resources are inadequate in this unit and needs special attention by the authorities concerned. There is an urgent need for developing an antibiotic policy for ICU patients as there is a selection of resistant strains of bacteria in these patients due to the extensive use of antibiotics. Netilmicin and amoxy-clavulinic acid are the antibiotics of choice in dialysis related peritonitis. The hospital infection control team should take a new interest in this area in this and help in the prevention and control of this serious and life threatening complication of peritoneal dialysis procedure. The recommendations of this study are as follows.

- Although antibiotics are highly effective in treating the bacterial infections they should not be taken as the only answer. Antibiotics not only lead to side effects, they are expensive and leads to evolution of antibiotic resistance in many organisms. Broad spectrum antibiotics should be used only when there is specific indication.
- Staff should keep themselves clean and adequate number of protective clothing and disposable gloves should be available. Visitors and movement of people to the ICU should be restricted.
- Simple infection control measures such as isolation, hand washing, barrier nursing and use of disinfectants should be encouraged in the ICU setting. Aseptic techniques should be strictly adhered to while performing invasive procedures. The infection control measures that are documented in the hospital infection control manual should be strictly followed in high risk units such as the intensive care unit and the dialysis unit.
- Invasive procedures such as venepuncture, insertion of intravenous lines and peritoneal dialysis catheters should be carried out under strict aseptic conditions. Change of dialysis fluid, administration of drugs to infusion fluids should be done carefully to avoid contamination. Insertion site should be carefully monitored for evidence of infection.
- In the management of ventilated patients, the hospital infection control guidelines should be strictly followed.
- The infection control measures that are documented in the infection control manual should be strictly followed in high risk units such as intensive care units and dialysis unit.

(RG/95/M/17 - Dr(Ms) J.K.P. Wanigasuria, Prof. R. Sheriff)

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Board of Management

Board of Management of NARESA (from 01-01-98 to 31-03-98)

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Director-General
NARESA
47/5, Maitland Place
Colombo 07.

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Dept. of Physics
University of Kelaniya
Kelaniya

Dr. C.R. Panabokke
Senior Associate
International Irrigation Management Institute (IIMI)
Sri Lanka National Programme
127, Sunil Mawatha
Battaramulla

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Nawala.

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George E. de Silva Mawatha
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Prof. of Botany
Open University
Nawala
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President
The Inst. of Engineers
120/15, Wijerama Mawatha
Colombo 7

Prof. A.D.V. de S. Indraratna
No. 355, Park Road
Colombo 5

Dr. P.A.J. Ratnasiri
Head, Montreal Protocol Unit
Ministry of Forest and Environment
6th Floor,
Unity Plaza
Colombo 4.

Prof. Vijay Kumar
Dept. of Chemistry
Univ. of Peradeniya
Peradeniya

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Postgraduate Inst. of Science
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Peradeniya

Ms. S.C. Perera
Director
Ministry of Plan Implementation
General Treasury
Colombo

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47/5, Maitland Place,
Colombo 7.

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Actg. Director
NSF
47/5, Maitland Place,
Colombo 7.

Prof. Uma Coomaraswamy
Prof. of Botany
Open University
Nawala

Eng. A.N.P. Wickremasuriya
President
The Inst. of Engineers
120/15, Wijerama Mawatha
Colombo 7.

Prof. A.D.V. de S. Indraratna
No. 355, Park Road
Colombo 5

Prof. P.A.J. Ratnasiri
Head, Montreal Protocol Unit
Ministry of Forest & Environment,
6th Floor, Unity Plaza,
Colombo 4.

Prof. Vijay Kumar
Dept. of Chemistry
Univ. of Peradeniya
Peradeniya

Dr. W.W.D. Modder
Director
T.R.I.
ST. Coombs
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Prof. M.T.M. Jiffry
Dean
Fac. of Medicine,
Univ. of Sri Jayawardenepura,
Nugegoda.

Ms. S.C. Perera
Director
Ministry of Plan Implementation
General Treasury,
Colombo.

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Principal Staff of NSF

Chairman

Prof. Priyani E. Soysa
(from 01-04-98 to 18-09-98)

MD(Cey.), DSc (Ruhuna)
FRCP (Edin. & Lond)
FCCP, DCH(Eng) FRCPCH(London)

Prof. Kapila Dahanayake
(from 23-09-98 to 31-12-98)

B.Sc.Hons(Cey.), Diploma and PhD
(Nancy)

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(from 01-04-98 to 16-10-98)

B.Sc.(Hons)(Cey), M.Sc.(S.L.)

Mr. M. Watson
(Actg. from 17-10-98 to 31-12-98)

B.Sc.(Cey), MPhil(London)

Director, Scientific Affairs

Mr.M.Watson

B.Sc.(Cey.),M.Phil(London)

Mr. R.M.W. Amaradasa

B.Sc.(S.L.),M.Sc.(S.L.)

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B.Sc. (S.L.)
M.Sc(Hons)(U.S.s.R.), M.Sc(Japan) (on
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Dr. D.B.M. Wickramaratne
(resigned on 30-09-98)
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Dr. J.M. Samarakoon Banda
(resigned on 17-10-98)

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B.Sc.(Hons)(S.L.)
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Mr. S.P. Dissanayake	B.Sc.(BAdm)(S.L.)
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Graduate Translator

Mrs. Subadra L. Tillekeratne	B.A. (Cey.)
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Staff Assistant (Administration)

Mr. S. Galketiya

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Dr. Ranjen Fernando
Prof. J.P. Edirisinghe
Ms. Y. Mapatuna
Prof. J. Jinadasa
Mr. Lesley Joseph
Mr. Arjan Rajasooriya

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New Grants awarded in 1998

Discipline - Agriculture

Grant No	Grantee/Institute	Project Title/Duration	Total Allocation
RG/98/AG/02	Dr. Sriyani E. Peiris Dept. of Crop Science Fac. of Agriculture Univ. of Peradeniya Peradeniya	Identification of nutrient disorders and toxicity symptoms on three <i>Dracaena</i> varieties popular in the export market. 2 years	507518
RG/98/AG/03	Dr. Deepthi Bandara Dept. of Biology Fac. of Agriculture Univ. of Peradeniya Peradeniya	Evaluation of sugarcane varieties SL 83-06, K 7130 and CO 775 on a physiological basis as affected by irrigation and nitrogen fertilizer application 1 year 6 months	1014600

Discipline - Chemical Sciences

Grant No.	Grantee/Institute	Title/Duration	Total Allocation (Rs)
RG/98/C/01	Dr R.M.G. Rajapakse Dr (Mrs) A.D.L. Chandani Department of Chemistry University of Peradeniya	Investigation of the applicability of conducting polymers for the fabrication of novel liquid crystal display devices. 03 years	272000/=
RG/98/C/02	Dr S.B.P. Athauda Department of Biochemistry University of Peradeniya	Isolation, purification and characterization of natural inhibitors of aspartic proteinases (Human Immunodeficiency Virus proteinase, Malarial parasite proteinase, Renin etc.). 03 years	576000/=
RG/98/C/03	Dr C.K. Seneviratne Department of Biochemistry Faculty of Medical Sciences University of Sri Jayewardenepura Dr (Ms) M.I. Thabrew Department of Biological & Clinical Chemistry Faculty of Medicine University of Kelaniya	Antioxidant Principles from Sri Lankan medicinal plants reputed to possess cardioprotective activity. 03 years	725220/=

Grant No.	Grantee/Institute	Title/Duration	Total Allocation (Rs)
RG/98/C/04	Prof. A.M. Abeysekera Department of Chemistry University of Sri Jayewardenepura	Synthetic pathways to potential perfumery and flavour compounds from furfural, a cheap readily available starting material. 03 years	892000/=
RG/98/C/05	Dr P.M. Jayaweera Department of Chemistry University of Sri Jayewardenepura	Syntheses, photophysics and spectroelectrochemical studies of transition metal complexes. 02 years	649440/=
RG/98/C/06	Dr (Mrs) D.T.U. Wijyaratne Department of Chemistry University of Colombo	Synthesis of tetrahydroberberine derivatives and assessment of their biological activities. 02 years	298000/=
RG/98/C/07	Dr L.L.W. Somasiri Mr J.M.N. Marikkar Mrs P. Hewavitharanage Coconut Research Institute (CRI)	Utilization of coconut water from DC manufacture to develop a beverage and a health drink. 02 years	322500/=
RG/98/C/08	Dr D.D.N. Barlo Daya Department of Physics University of Colombo Mr M.S.B. Mohottalage Industrial Technology Institute (ITI)	Quantitative estimation of active ingredients in some Sri Lankan medicinal plants using ion induced desorption techniques. 03 years	719077/=

Discipline - Biotechnology

Grant No.	Grantee/Institute	Title/Duration	Total Allocation (Rs)
SIDA/98/BT/01	Dr (Mrs) M.P.K.S.K. de Silva University of Ruhuna	Clarification of taxonomic status of newly described fish species <i>Rasbora 'wilpita'</i> and its genetic relationship with other <i>Rasbora</i> species found in Sri Lanka 02 years	460,648
SIDA/98/BT/02	Dr (Mrs) Maya B. Gunasekera Prof. W.D. Ratnasooriya University of Colombo	Molecular systematics of <i>cynopterus</i> species complex (Bats-megachiroptera - pteropodidae) in Sri Lanka 01 year	469,000
SIDA/98/BT/03	Dr B.G.N.D.K. de Silva University of Sri Jayewardenepura	Analysis of the genetic variations of the An. <i>Culicifacies</i> complex in Sri Lanka using DNA based techniques 02 years	667,000
SIDA/98/BT/04	Dr Sanath Hettiarachchi Dr L.P. Jayatissa University of Ruhuna	Phenology of <i>Nipa fruticans</i> in relation to environmental factors and genetic diversity for conservation and management 02 years	545,000

SIDA/98/BT/05	Dr (Mrs) D.M.S.H.K. Ranasinghe University of Sri Jayewardenepura	Clonal multiplication of <i>Pericopsis moniana</i> by tissue culture 02 years	512,880
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Biological Sciences - 1998

Grant No.	Grantee/Institute	Project Title/Duration	Total Allocation (Rs)
RG/98/B/1	Dr Anura Wijsekera HORDI Peradeniya.	Documenting biodiversity - A taxonomic study of plant bugs (<i>Hemiptera:Miridae</i>) of Sri Lanka. 03 years	1,426,609/-
RG/98/B/2	Prof. J.P. Edirisinghe Department of Zoology University of Peradeniya Peradeniya.	Identification of crop pollinating <i>Hymenoptera/Apoidea</i> of Sri Lanka with emphasis on studies on pollinators of cucumber. 03 years	625,871/-
RG/98/B/3	Prof. S.W. Kotagama Department of Zoology University of Colombo. Dr U.K.G.K. Padmalal Mr B.Z. Nizam Division of Zoology Open University Nawala, Nugegoda.	Distribution and habitat relationships of birds, reptiles and amphibians in the Knuckles region, Sri Lanka. 03 years	1,082,400/-
RG/98/B/4	Dr L.P. Jayatissa Department of Botany University of Ruhuna Matara.	A study to determine the distribution and the abundance of toxigenic Cyanobacteria and toxicity of Cyanobacterial blooms in Sri Lankan fresh water. 03 years	466,000/-

New Grants awarded in 1998

Discipline - Energy

Grant No.	Grantee/Institution	Project Title/Duration	Total Allocation (Rs.)
RG/98/EP/001	Dr Seneviratne R.R.I. Rathmalana	To develop an efficient and cost effective treatment system for the serum water that is discharged when latex is centrifuged and also to use the bio-gas generated in the process of treatment as a energy source 03 years	Rs.797,000/=
RG/98/EP/002	Dr. Ajith De Alwis Department of Chemistry Univ. of Moratuwa	Biomethanation as a process waste recycling technique with special reference Brewery spent grain. 01 year	Rs.190,000/=

New Grants Awarded in 1998

Discipline : Information Science

Grant No	Grantee/Institute	Project Title/Duration	Total Allocation Rs.
RG/98/TS/01	Dr.(Mrs) Lakshmi Arambewela III Buddhaloka Mawaitha Colombo 7	Preparation of Drug Monograph and Technical Bulletin 01 year	149,000/-

New Grants awarded in 1998

Discipline - Man and the Biosphere

Grant No.	Grantee/Institute	Project Title/Duration	Total Allocation
RG/98/MAB/01	Dr Ranjen Fernando 10, Daniel Avenue Colombo 06.	Pilot Project of Awareness Creation on Medicinal Plants 01 year	100000
RG/98/MAB/02	Prof. M.D. Dasanayake 73/1, Circular Road Dangolla Kandy	Completion of the Revision of the Flora of Ceylon Project 09 months	109750
RG/98/MAB/03	Prof. M.S.J. Wijeyaratne Dr U.S. Amarasinghe Dept. of Zoology Univ. of Kelaniya Kelaniya.	Population dynamics of selected endemic fish species in tow river basins of Sri Lanka 2 years	549400

New Grants awarded in 1998

Discipline - Medical, Veterinary & Dental Sciences

Grant No	Grantee/Institute	Project Title/Duration	Total Allocation Rs.
RG/98/M/01	Dr. H.J.M. Perera Dept. of Forensic Medicine Fac. of Medicine Univ. of Colombo Colombo 8	Determination of the normal weights of body organs of Sri Lankans in autopsy samples in order to obtain a reference range 2 years	68,500
RG/98/D/01	Dr. U.S. Usgoda Arachchi NIHS Kalutara	Assessment of the feasibility and the effectiveness of new restorative technique in mobile out reach dental clinics in rural community in Sri Lanka 09 months	112,900
RG/98/M/02	Dr. K.A.M. Ariyaratne Dr(Mrs) K. Senanayake STD/AIDS Control Programme De Saram Place, Colombo 10 Dr. S. Sivayogan Dept. of Community Medicine Univ. of Sri Jayawardenepura Nugegoda	Defaulting among patients attending Central Sexually Transmitted Diseases Clinic and the impact of an intervention programme. 1 year	59,000
RG/98/M/03	Dr. M.S. Ibralebbe No 55, Central Road Sammanthurai	Occupational health hazards and their effect on health of stone quarry workers 9 months	70,810

Grant No	Grantee/Institute	Project Title/Duration	Total Allocation Rs.
RG/98/M/04	Dr. M.D.S. Lokuhetty Dept. of Pathology Prof. A.H. Sheriffdeen Dept. of Surgery Fac. of Medicine Univ. of Colombo Colombo 8.	Study to assess prognostically important features of breast carcinoma in a Sri Lankan population. 2 years	335,850

NEW GRANTS AWARDED IN 1998
Discipline - PHYSICAL, ENGINEERING, MATHEMATICAL SCIENCES & BUILT ENVIRONMENT

Grant No	Grantee/ Institution	Project Title/ Duration	Total Allocation (Rs.)
RG/98/P/001	Dr. Kanthi K.A.S. Yapa Dept. of Physics Univ. of Ruhuna Dr. S.C. Jayawardena Computer Unit Univ. of Ruhuna Matara.	Analysis, Visualization and Retrieval of Remotely sensed data on ocean colour of waters around Sri Lanka. 02 years	298000/-
RG/98/P/002	Prof. K.N.J. Katupotha Dept. of Geography Univ. of Sri Jayewardenepura Nugegoda.	Sedimentological study of the City of Colombo and its environs 02 years	209800/-
RG/98/P/003	Dr P. Wickramagama Dr SW Navaratne Dr SN Wickramaratne Dept. of Geography Univ. of Peradeniya.	Creation of a coastal geographic information system (CGIS). 02 years	436400/-
RG/98/P/004	Mr TSG Peiris Coconut Research Inst. Bandirippuwa Estate Lunuwila.	An assessment of climate change in Sri Lanka and its effects on the national coconut production. 02 years	155100/-

RG/98/P/005	<p>Dr(Ms) WCW Perera Dept. of Mathematics Open University</p> <p>Dr BMSG Banneheka Dept. of Mathematics Univ. of Sri Jayewardenepua</p> <p>Dr K. Karunaratne National Cancer Inst. Maharagama.</p>	<p>Statistical models for the frequency of cervical cancer screening.</p> <p>02 years</p>	323000/-
RG/98/P/006	<p>Dr Karunaratna, G.H.U. Senior Lecturer Dept. of Civil Engineering Univ. of Moratuwa Moratuwa.</p>	<p>Investigation of performance of coral reefs in coast protection</p> <p>02 years</p>	300736/-

Commissioned Research

CRG/98/P/001	<p>Dr S de Costa Dept. of Civil Engi. Open University Nawala.</p>	<p>A study on the solid waste management of the Colombo Municipal Council semi residential area.</p> <p>02 years</p>	227000/-
CRG/98/P/002	<p>Dr KPP Pathirana Dr Uditha Ratnayake Dept. of Civil Engineering University of Moratuwa.</p>	<p>Behaviour of sediment transport in unsteady flow – An experimental study.</p> <p>02 years</p>	500752/-

Discipline :- Social Sciences

Grant No.	Grantee/Institute	Title/Duration	Total Allocation (Rs)
RG/98/SS/01	Dr. Arjuna Parakrama Dean Faculty of Art Univ. of Colombo Colombo 3.	Approaches to text and context in English language learning & teaching in Sri Lanka as a means of re-orienting English towards new social goals and realities 01 year	666,950.00
RG/98/SS/02	Ms. S V K Gnanasaundari Faculty of Education University of Colombo Colombo 3.	A study of the relations between parents and schools in Sri Lanka 01 year	26,938.00
RG/98/SS/03	Mr. S L J Fernando Dept. Of Geography Faculty of Art University of Ruhuna, Matara.	Geomorphology of the wetlands of Southwest coast of Sri Lanka & ecological & socio economic problems 01 year	107,000.00
RG/98/SS/04	Ms. Priyanthi Samaraweera Dept of Science & Technology Education, Univ. Of Colombo Colombo 3.	A study to examine the extent to which the Agriculture curriculum implements in years 10-11 in Sri Lanka schools from the year 1996 lays the foundation required to study the curriculum in institutions producing agricultural professionals 01 year	35,940.00
RG/98/SS/05	Mr. M J R David Journalism Unit, Univ. of Colombo Colombo	The role of new communication technology in facilitating rural development: possibilities - profiles and solutions 01 year	249,000.00

Discipline - Zoological Survey

Grant No.	Grantee/Institution	Project title/Duration	Total Allocation (Rs)
ZSSL/98/01	Mr Anslern de Silva Faculty of Medicine University of Peradeniya Peradeniya.	The status and habitat preference of the Amphibians and Reptiles at Horton Plains National Park. 06 months	136,138/-
ZSSL/98/02	Prof. J. Jinadasa Department of Zoology Univ. Of Sri Jayewardenepura Nugegoda.	Studies on the distribution, population density and habits of fish at Horton Plains National Park. 01 year	310,500/-
ZSSL/98/03	Mr Anslern de Silva Faculty of Medicine University of Peradeniya Peradeniya	Video film on Horton Plains - the good the bad and the ugly.	100,000/-
ZSSL/98/04	Dr K.D. Arulpragasam Vice Chairman NEC, Wijerama Mawatha Colombo 7. Ms Dinarzarde Raheem 36/7A, Sir Marcus Fernando Mw. Colombo 7.	Land snail diversity in Sri Lankan rain remnants. 03 months	177,600/-

Grants sponsored by NARES/NSF

Status summary during 1998

Discipline	Agriculture & Animal Husbandry	Biological Sciences	Chemical Sciences	Energy	Information Sciences	Medical Veterinary & Dental Sciences	Physical & Engineering Sciences	Social Sciences	Biotechnology	Science Education	Natural Resources	Man & the Biosphere
Total No. of grants operating during 1998	15	24	31	3	05	31	28	15	16	01	04	04
Grants awarded 1998	02	04	08	1	01	05	10	05	-	-	-	01
Amount allocated for 1998 (new and ongoing Rs.)	3,047,612	2,529,895	2,920,079	-	126,000	3,533,720	2,109,650	812,962	1,231,410	-	664,516	624,824
Grants completed 1998	-	04	02	-	02	10	5	03	03	01	01	-
Grants withdrawn 1998	-	-	-	-	-	-	-	01	-	-	-	-
Grants terminated 1998	-	01	-	-	-	02	-	-	02	-	-	-
RA's appointed 1998	03	02	07	-	01	01	5	07	-	-	-	01
Thesis PG 1998	-	01	-	-	-	-	2	-	02	01	-	-
Registered for PG 1998	-	02	01	-	-	03	3	-	-	-	-	01
New applications 1999	06	10	11	02	03	25	10	22	-	04	02	01
Funds requested for 1999 (Rs.)	2,730,382	2,318,250	6,568,090	1,136,000	240,000	7,446,247	5,095,052	2,967,929	-	344,608	646,884	262,800
Grants approved for 1999 (up to January)	-	09	05	01	01	07	03	-	-	-	02	01

Grants sponsored by Foreign Agencies (I)

Status summary during 1998

Foreign Agency/Discipline Status	SAREC Coastal Ecology Research Programme	SAREC Renewable Energy & Energy Efficiency	SAREC Buffalo Research Programme
Total No. of grants operating during 1998	02	04	01
Grants awarded - 1998	-	02	-
Amount allocated - 1998 (new and ongoing Rs.)	Rs. 7m	Rs. 2.5m	Rs. 1.5m
Grants completed - 1998	02	-	-
Grants withdrawn - 1998	-	-	-
Grants terminated - 1998	-	-	-
RA s appointed - 1998	02	-	-
Registered for PG - 1998	02	-	-
Thesis PG - 1998	-	01	-
New applications - 1999 (Rs)	-	-	-
Funds requested for 1990 (Rs)	-	-	-
Grants approved for 1999 (upto January)	-	-	-

Grants sponsored by Foreign Agencies (II)
SIDA/NSF Grant Scheme

Status summary during 1998

Foreign Agency/Discipline Status	Biotechnology	Agriculture	Social Sciences
Total No. of grants operating during 1998	-	-	01
Grants awarded - 1998	07	01	01
Amount allocated - 1998 (new and ongoing Rs.)	3,368,720	166,500	192,750
Grants completed - 1998	-	-	-
Grants withdrawn - 1998	-	-	-
Grants terminated - 1998	-	-	-
RAs appointed - 1998	04	01	01
Registered for PG - 1998	-	-	01
Thesis PG - 1998	-	-	-
New applications - 1999 (Rs)	03	-	-
Funds requested for 1999 (Rs)	2,465,555	-	-
Grants approved for 1999 (upto January)	02	-	-

NATIONAL SCIENCE FOUNDATION

Balance Sheet as at 31-12-96

As at 31-12-97				
	<u>Funds Employed</u>			
(23,212,904.48)	NSF Fund	(28,034,833.77)		
443,000.00	Add: Drawings from Treasury	400,000.00		
--	Acquisitions of assets	407,462.50		(27,227,371.27)
(5,264,929.29)	Less: Excess of Expenditure over income			(5,145,485.35)
(28,034,833.77)				
5,954,350.14	<u>Documentation Unit Capital Fund</u>	6,415,386.97		
388,000.00	Add: Drawings from Treasury	415,000.00		
73,581.53	Acquisitions of assets	--		6,820,386.97
544.70	Less: Net Expenditure Note 1-1			47,691.63
6,415,386.97				6,772,695.34
3,986,075.07	<u>Research Grant Fund</u>	3,918,472.53		
16,793,520.00	Add: Drawings from Treasury	18,165,970.00		
16,831,122.54	Less: Net Expenditure - Note 1-2			22,114,442.53
3,948,472.53				17,535,575.63
1,898,551.97	<u>Man & Biosphere Fund</u>	1,899,261.70		
80,000.00	Drawings from Treasury	379,000.00		2,278,261.70
79,290.27	Less: Expenditure - Note 1-3			380,164.80
1,899,261.70				1,898,096.90
797,539.45	<u>Miscellaneous Funds</u>	798,004.45		
623,000.00	Add: Drawings from Treasury	650,000.00		1,448,004.45
622,535.00	Less: Net Expenditure - Note 1-4			675,274.37
798,004.45				772,730.08
153,497.94	Scientific Man Power Project Fund	153,497.94		
--	Add: Drawings from Treasury	--		153,497.94
--	Less: Expenditure			--
153,497.94				153,497.94

As at 31.12.97	Cost as at 01.01.97	Additional Disposals	Accumulated Depreciation	Net Balance
Represented by Fixed Assets				
42,325,515.45	42,325,515.45	--	--	42,325,515.45
1,259,713.30	3,085,910.61	269,153.00 (1,153,779.50)	2,469,792.51	1,385,271.20
7,484,850.13	16,164,067.79	1,845,321.26	10,797,494.16	6,488,115.39
2,867,088.35	8,323,875.80	(1,393,101.93)	5,049,460.52	1,811,313.35
44,895.00	31,586.14	(21,735.00)	228,821.14	31,130.00
3,300.00	13,170.50	--	10,970.50	2,200.00
--	1,504.00	--	1,504.00	--
87,516.98	275,917.75	(16,694.50)	320,926.27	119,784.13
		81,487.15 (129.35)		
494,758.86	1,189,939.03	84,526.11	1,034,139.82	540,195.97
3,556,544.31	30,77,067.53	5,150.00	27,985,539.22	2,396,678.31
		(198,128.75)		
2,928,505.82	7,146,613.65	268,172.33	4,908,930.38	2,707,732.25
61,052,687.90	110,385,277.45	(229,759.18)	52,807,578.52	57,847,936.75
650,000.00			650,000.00	
13,953.64			13,953.64	
				663,953.64
Current Assets				
715,738.80			734,147.62	
5,147,247.82			4,872,902.59	
987,745.44			705,364.75	
70,109.45			70,109.45	
46,570,198.42			46,570,198.42	
976,558.94		6,553,419.74		
1,872,774.67		1,551,696.00		
283,918.96		360,330.96		
7,991.46		7,991.46		
12,500.00		12,500.00		
--		--		
10,933.19		24,403.19		
4,167.76		4,559.86		
118,076,326.45			8,514,901.21	61,467,524.04
				119,979,514.43

Director,
NATIONAL SCIENCE FOUNDATION
 47/5, Malind Place,
 Colombo 7.

<u>Working Committee Fund</u>				
Add: Drawings from Treasury	1,034,025.20	--	1,034,025.20	
Less: Expenditure	--	-----	--	1,034,025.20
	1,034,025.20			
<u>Foreign Aid Fund</u>				
Add: Drawings from Treasury	67,486,584.73	74,562,839.57		
Treasury Deposit	9,517,000.00	27,017,528.00		
	6,281,123.00	--		
Less: Net Expenditure Note 1.5	8,721,868.16	-----	101,580,367.57	
			20,992,174.79	80,588,192.78
	74,562,839.57			
	48,478,160.00			47,982,660.00
<u>Capital Reserves</u>				
<u>Current Liabilities</u>				
Creditors	1,704,355.32	1,523,182.99		
Accrued Charges	665,613.47	438,401.76		
Provisions	6,406,978.06	6,562,064.05		
Store-keepers refundable security deposits	4,167.76	4,559.86		
Tender Deposits	35,450.00	37,450.00		
Suspense A/C	4,947.25	-----		
	-----			8,565,658.66
	118,076,326.45			5,947.25
	-----			-----
				119,979,514.43

NATIONAL SCIENCE FOUNDATION

Income and Expenditure Account as at 31.12.98

As at 31.12.97					
17,410,000.00	Drawings from Treasury				19,419,140.00
	Income for the year				
207,703.70	Interest received			155,342.78	
42,139.00	Sundry Income			66,975.50	
400,431.50	Sale of Publications			411,678.75	
13,068.10	Photocopy receipts			44,955.00	
201,387.81	Receipts from Printing out- ^{side} standing jobs			186,137.48	
50,122.34	SLSIC Income			98,144.00	
-	Profit on sale of fixed Assets			-	
1,750,000.00	10% Administration cost - Foreign Aid			1,000,000.00	
-	Excess provisions re doubtful debtors			27,578.19	
-	Cash Discount received			9,664.12	
					2,000,475.82
	Less: Expenditure for the year				
34,514.00	Authority Expenditure		48,124.00		
40,346.80	Travelling & Allowances for Authority members		39,207.50		
13,257.50	Entertainment				
	Printing & Publications				
	Staff Emoluments			87,331.50	
8,726,876.12	Salaries & Allowances		10,080,891.88		
1,231,964.46	Employees Provident Fund		1,423,213.95		
246,118.45	Employees Trust Fund		278,870.19		
1,112,123.00	Provisions for Retiring Gratuity		1,032,767.00		
136,257.14	Overtimes		178,357.16		
5,220.60	Holiday Payment		13,902.81		
62,129.80	Uniforms		100,298.00		
39,900.00	Staff Training		31,638.80		
					13,139,939.77
					21,419,515.82

Office Administration

- 69 -

63,600.50	Travelling (Official)	56,629.95	
480,995.60	Stationary & Consumables	548,794.25	
381,956.24	Electricity	464,742.84	
322,450.46	Telephone	362,932.80	
95,424.90	Postage	83,194.25	
95,000.00	Audit fees	106,875.00	
3,353.00	Legal fees	-	
12,275.00	Bank charges	15,625.00	
56,555.79	Medical expenses	47,072.57	
143,945.00	Advertising	159,340.00	
721,631.67	Maintenance of Motor Vehicles	817,656.79	
286,422.52	Maintenance of Office Equipment & Furniture	268,658.31	
145,156.04	Maintenance of Building	109,002.02	
69,400.00	Staff Welfare	92,900.00	
185,605.66	Insurance	242,552.23	
75,442.00	Water Consumption charges	139,628.31	
287,324.90	Security Services	332,407.14	
5,630,065.00	Depreciation	5,435,896.00	
100,781.51	Sundry Expenses	141,670.28	
1,750,000.00	10% Administration cost expenditure	1,000,000.00	
-	Exhibitions	270,077.23	
79,407.04	Provisions for doubtful debtors	-	
0.12	Bad Debtors A/C	-	
-	Loss from sale of fixed assets	86,310.30	
-	House rent	8,000.00	
			10,789,965.27
	<u>Other</u>		
24,702.50	Science & Technology Indicators Unit	1,300.00	
30,403.00	National Awards	126,563.75	
217,145.50	Steering Committees Note 1.6	246,313.13	
1,346,264.47	Sri Lanka Scientific & Technical Information Center - Note 1.7	1,118,635.93	
182,415.00	Consultancies for NSF work	208,004.00	
931,027.20	Subscriptions to International Scientific Organizations	1,064,201.48	
11,488.00	Publications arising out of Steering Committees	8,920.00	
80,000.00	Local Experts	154,468.19	
			2,928,406.48
(5,326,854.04)	Excess of Expenditure over Income		26,945,643.02
61,924.75	Add : Prior Year Adjustment (Net)		(5,526,027.20)
			114,958.15
-	Excess Capital Reserve		(5,640,985.35)
(5,264,929.29)			495,500.00
			(5,145,485.35)

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.

The ten- percent of foreign donor funds received which is for covering overheads, has been taken Credit in the Income and Expenditure Statement.

1.1 **Documentation Unit Capital Fund Expenditure**

1.	SLSTIC Equipment	268,172.33
2.	SLSTIC Books	84,526.11
3.	SLSTIC Workshop & Seminars	47,691.63

		400,390.07
Less :	Cost of Equipment & Books	352,698.44

		47,691.63

1.2 **Research Grants Expenditure**

	Actual expenditure for the year	18,679,658.45
	Zoological Survey	26,599.91

		18,706,258.36
Less :	Cost of Equipment	153,755.00

		18,552,503.36
Less:	Prior year adjustments (Net)	1,016,927.73

		17,535,575.63

1:3 **Man & the Biosphere Expenditure**

1.	MAB/97/01	111,027.67
2.	MAB/98/01	100,000.00
3.	MAB/98/02	43,750.00
4.	MAB/98/03	99,800.00
5.	MAB/1.3/3	25,587.13

		380,164.80

1.4	<u>Miscellaneous Fund Expenditure</u>	
1.	Participation in International Scientific Work	64,469.40
2.	Seminars & Symposia	443,016.77
3.	Special Publications	147,159.20

		654,645.37
	 Add: Prior year adjustment (Net)	 20,629.00

		675,274.37
		=====
1.5	<u>Foreign Aid Expenditure</u>	
	SAREC Expenditure	23,717,320.70
	Less: Cost of Equipment	943,451.64

		22,773,869.06
	 Less : Prior year adjustment (Net)	 1,370,306.78

		21,403,562.28
	 Less : Money received from sale of buffaloes & milk	 411,387.49

		20,992,174.79
		=====
1.6	<u>Steering Committees Expenditure</u>	
		RS.
1.	Agriculture & Animal Husbandry S/C	17,564.00
2.	Biotechnology S/C	13,441.00
3.	Biological Sciences S/C	23,019.76
4.	Chemical Sciences S/C	9,694.00
5.	Editorial S/C	23,281.00
6.	Medical & Vet. Sciences S/C	20,412.00
7.	Natural Resources S/C	14,083.00
8.	Physical & Engineering Sciences S/C	9,791.75
9.	Social Sciences Research S/C	9,710.00
10.	Science Education Research S/C	40,783.75
11.	S & T Information S/C	8,280.00
12.	Energy S/C	7,418.00
13.	Zoological Survey S/C	47,410.87
14.	Intellectual Property Rights S/C	1,424.00

		246,313.13
		=====

1:7 Sri Lanka Scientific & Technical Information Center Expenditure

1.	SLSTIC Maintenance & repairs	13,224.34
2.	SLSTIC Periodicals	262,736.65
3.	SLSTIC In-house printing & Binding	43,569.14
4.	SLSTIC Consumables	539,132.14
5.	SLSTIC Miscellaneous	62,190.32
6.	SLSTIC Publications & Publicity	197,783.34
		<u>1,118,635.93</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.

2.1 Debtors

Total Debtors	4,938,909.36
Less : Provision for doubtful debts	66,006.77
	<u>4,872,900.59</u>

3. Liabilities

3.1 Creditors

Creditors amounted to RS. 1,523,182.99 Represents monies held by NSF as given below

	RS.
1. CSC A/C	50,747.00
2. CSC funds received for Remote Sensing Seminar	24,098.13
3. Sundry Creditors	162,258.19
4. Fauna & Flora A/C	174,860.00
5. Genetic Resources A/C (CSC funds)	104,815.00
6. Mobile Science exhibition A/C	7,991.46
7. MAB Seminar A/C	646,264.89
8. RG/89/IS/03 A/C	65.75
9. RG/95/MAF A/C	76,989.10
10. Staff Creditors	17,639.00
11. Funds received for preparation of bio-diversity report	11,648.08
12. Purna A/C	245,806.39
	<u>1,523,182.99</u>

3:2 **Employees Benefit**

All employees are covered by EPF & ETF except the NAITA Trainees. 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.

Amount paid for the year	RS. 510,860.00
Provisions for the year	RS. 1,032,767.00
	=====

4. Publications for the value of (Valued at selling price) is available with us. RS. 2,567,396.00
=====

5. NSF owns 17 vehicles. They are located as follows

AT NSF	-	9
With Research Grantees	-	8

		17
		==

6. Funds drawn from the Treasury during 1998

Consolidated Funds	-	RS. 19,999,970.00
		=====
Recurrent Funds	-	RS. 19,419,140.00
		=====
Foreign Aid Funds	-	RS. 28,017,528.00
		=====



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 சுலாங்காபுலாங்கா தலைமை அறிப்பறி திணைக்களம்
 சுதந்திர சதுக்கம், கொழும்பு 7, இலங்கை
AUDITOR-GENERAL'S DEPARTMENT
INDEPENDENCE SQUARE, COLOMBO 7, SRI LANKA.
 දිනය/මිසිලි/Date : 2001 පෙබරවාරි 08 දින.

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 தொலைபேசி
 Telephone } 691151
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 பக்ஸ் இல.
 Fax No. } 697451
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 අවසන් වර්ෂය සඳහා වූ ගිණුම් පිළිබඳව 1971 අංක 38
 දරණ මුදල් පනතේ 14(2)(ඔ) වගන්තිය ප්‍රකාර
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සමාන හා 2001 ජනවාරි 10 දිනැති මාගේ ලිපියට යොමුවේ.

02. ඉහත සඳහන් ලිපිය සමග එවන ලද මාගේ වාර්තාවේ ඉංග්‍රීසි අනුච්ඡදය
 මේ සමග එවනු ඇත.

(එස්.සී.මායාදත්තේ)
 විගණකාධිපති.

පිටපත් :- 01. ලේකම් - විද්‍යා හා සාකච්ඡා අමාත්‍යාංශය.

02. ලේකම් - මුදල් හා මුළුතැන්පාදන අමාත්‍යාංශය.



පිටිණකාරීන්ගේ දෙපාර්තමේන්තුව
 නිලධාරී මණ්ඩලය, කොළඹ 7, ශ්‍රී ලංකාව.
 கணக்காய்வாளர் தலைமை அபிப்பதி திணைக்களம்
 சுதந்திர சதுக்கம், கொழும்பு 7, இலங்கை
AUDITOR-GENERAL'S DEPARTMENT
INDEPENDENCE SQUARE, COLOMBO 7, SRI LANKA.

දිනය/திகதி/Date :10 January 2001

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 எனது இல. } EC/RNSF/FA/98
 My No. }
 ඔබේ අංකය }
 உமது இல. }
 Your No. }

The Chairman,
National Science Foundation

Report of the Auditor General on the accounts of the National Science Foundation for the year ended 31 December 1998 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 1998 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 comments 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. A detailed report in terms of Section 13(7)(a) of the Finance Act was furnished to the Chairman of the Foundation on 9 August 1999.

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 planned and carried out in accordance with generally accepted 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 judgements 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 gives discretionary powers to the Auditor General to determine the scope and extent of audit.

2. Accounts

2:1 Audit opinion

Except for the effects of the adjustments arising from the matters referred to in paragraph 2:5 of this report, I am of opinion that the financial statements have been satisfactorily prepared to present fairly in all material respects, the financial position of the Foundation as at 31 December 1998 and results of its operations for the year then ended in accordance with the generally accepted accounting principles and the accounting policy referred to at note 1 of the financial statement.

2:2 Financial results

The activities of the Foundation are being carried out under the general fund and 6 special fund accounts. According to the accounts presented, the financial results of the general funds of the Foundation for the year ended 31 December 1998 had resulted in a deficit of Rs.24,945,167 before taking into consideration the government grant for recurrent expenditure as compared with the previous year's deficit of Rs.22,736,854.

The deficit was reduced to Rs.5,526,027 after taking into consideration the government grant for recurrent expenditure of the year under review amounting to Rs. 19,419,140. The deficit for the previous year was reduced to Rs.5,326,854 after taking into consideration the government grant for recurrent expenditure for the previous year amounting to Rs.17,410,000.

The financial results of the activities under special funds had resulted in a deficit of Rs.39,630,882 before taking into consideration the government grant and foreign aid for special funds as compared with the previous year's deficit of Rs.26,255,361. The surplus for the year under review was Rs.6,986,616 after taking into consideration the government grant (including foreign aid) for activities of the special fund amounting to Rs.46,617,498 as compared with the surplus of Rs.7,500,865 for the previous year after taking into consideration the government grant (including foreign aid) for activities of the special fund amounting to Rs.33,756,226.

2:2:1 General Fund

A summary of the financial results of the general fund for the year under review and the previous year is given below.

	<u>Year ended 31 December</u>			
	<u>1998</u>		<u>1997</u>	
	Rs.	Rs.	Rs.	Rs.
<u>Income</u>				
Foreign aid -				
Receipt in respect of				
administrative cost	1,000,000		1,750,000	
Sale of publications	411,679		400,432	
Interest on loans	155,343		207,704	
Supply of printing services				
to outsiders	106,137		201,388	
Receipt from photocopies	44,955		13,068	
Miscellaneous	66,976		42,139	
Income from bibliography unit	98,144		50,122	
Overprovision - bad debts	27,578		-	
Commission received	9,664		-	
		2,000,476		2,664,853
<u>Expenditure</u>				
Office administration	10,789,965		10,929,553	
Salaries of staff	13,139,940		11,560,590	
Board of control	87,332		88,118	
Miscellaneous	2,929,406		2,823,446	
		26,945,643		25,401,707
Deficit before government grant		(24,945,167)		(22,736,854)
Less : Government Grant for				
recurrent expenditure		19,419,140		17,410,000
		(5,526,027)		(5,326,854)
Balance of the fund b/f	(28,034,834)		(23,212,905)	
Prior period items	(114,958)		61,925	
Excess in capital reserve	495,500		-	
Grant from the Treasury	400,000		443,000	
Purchase of assets	407,463		-	
		(26,340,829)		(22,707,980)
Balance of the fund c/f		(32,372,856)		(28,034,834)

2.2.2 Special fund

The financial result of each special fund for the year under review and the previous year is shown in the following statement.

	Year ended 31 December			
	Rs. 1996	Rs.	Rs. 1997	Rs.
<u>Research grant fund</u>				
Government grant	13,165,970		16,793,520	
Less: Expenditure	17,535,576		18,831,123	
Deficit / Surplus		530,394		(37,603)
<u>Capital fund of the Bibliography unit</u>				
Government grant	405,000		461,583	
Less: Expenditure	47,692		543	
		357,308		461,038
<u>Foreign aid fund</u>				
Receipt of foreign aid	27,017,528		9,517,000	
Treasury deposits			6,281,123	
	27,017,528		15,798,123	
Less: Expenditure	20,992,175		8,721,868	
		6,025,353		7,076,255
<u>Human and planetary fund</u>				
Government grant	379,000		80,000	
Less: Expenditure	380,185		79,290	
		(1,185)		710
<u>Miscellaneous fund</u>				
Government grant	650,000			
Less: Expenditure	675,274			
Deficit		(25,274)		465
Net (deficit) surplus of the special fund		6,986,616		7,500,865

2.3 Financial structure

According to the accounts presented, the position of the financial structure as at 31 December 1998 compared with that as at 31 December 1997 is given below.

	<u>As at 31 December</u>	
	<u>1998</u>	<u>1997</u>
	Rs.	Rs.
<u>Resources</u>		
Capital reserve	47,982,660	48,478,160
General fund	(32,372,856)	(28,034,834)
<u>Special fund</u>		
Foreign aid fund	80,588,193	74,562,840
Research grant fund	4,578,867	3,948,473
Capital fund of the bibliography unit	6,772,695	6,415,387
Human and planetary fund	1,898,097	1,898,262
Miscellaneous fund	772,730	798,004
Working committee fund	1,034,025	1,034,025
Scientific human energy project fund	153,498	153,498
	<u>111,407,909</u>	<u>109,254,815</u>
<u>Utilization</u>		
Fixed assets (At written down value)	58,511,891	61,716,642
Net current assets	<u>52,896,018</u>	<u>47,538,173</u>
	<u>111,407,909</u>	<u>109,254,815</u>

2:4 Cash flow

According to the accounts presented, the cash flow of the Foundation for the year under review and the previous year is given in the following statement.

	Year ended 31 December			
	1998		1997	
	Rs.	Rs.	Rs.	Rs.
<u>Cash flow from operating activities</u>				
Deficit for the year (Note 1)		(5,881,370)		(534,558)
<u>Adjustments for items not involving movement of cash</u>				
Provision for gratuity	1,032,767		1,112,123	
Depreciation	5,435,898		5,834,740	
<u>Adjustments for loss in sale of fixed assets.</u>	86,310		-	
Provision for doubtful debts	-		79,407	
Provision for foreign aid			940,421	
		<u>6,554,973</u>		<u>7,766,691</u>
		873,603		2,232,133
Prior period items	(114,958)		81,925	
<u>Adjustment for item not involving movement of cash</u>				
Depreciation	3,886		2,711	
		<u>(111,072)</u>		<u>64,636</u>
Operating surplus before changes in items of working capital		762,531		2,296,769
<u>Changes in items of working capital</u>				
Stock - (Increase)	(18,409)		(5,891)	
Debtors - Decrease	274,375		37,483	
Prepayments - Decrease/(Increase)	262,380		(271,017)	
Creditors - (Decrease)/Increase	(181,172)		131,734	
Accrued expenses - (Decrease)/Increase	(227,212)		17,763	
Other assets - Increase/(Decrease)	1,000		(448)	
Deposits refundable - Increase	393		-	
Tender deposits - Increase	2,000		-	
		<u>133,325</u>		<u>(90,396)</u>
		895,856		2,206,373
Payment of gratuity	(510,860)		-	
Foreign aid	(366,821)		-	
		<u>(877,681)</u>		-
Net cash generated from operating activities		<u>18,175</u>		<u>2,206,373</u>

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Cash flow from <u>investing activities</u>			
Purchase of fixed assets	(2,146,347)		(2,546,864)
Proceeds from sale of fixed assets	232,469		-
Receipt of income from interest	155,343		207,704
Treasury deposits	-		(8,281,123)
Cash utilized investing activities		(1,758,535)	(3,620,283)
<u>Cash flow from financing activities</u>			
Government grant	47,017,498		34,125,643
Foreign aid	(20,992,175)		(8,721,868)
Research grant fund	(17,535,578)		(16,533,031)
Bibliography unit fund	(47,692)		(545)
Human and planetary fund	(380,165)		(79,290)
Miscellaneous fund	(675,274)		(822,535)
Net cash generated from financing activities		7,386,619	7,868,324
Net increase in items of cash and cash equivalents		5,648,256	1,454,414
Balance of items of cash and cash equivalents at beginning of the year		2,868,845	1,414,231
Balance of items of cash and cash equivalents at end of the year		8,514,901	2,868,645

<u>Note I</u>	31.12.1996	31.12.1997
	Rs.	Rs.
Operating deficit	(6,526,027)	(6,328,854)
Receipt of interest on Treasury deposits	(155,343)	(207,704)
Net operating deficit	5,681,370	(5,534,558)

Note II

	<u>As at 31 December</u>	
	<u>1996</u>	<u>1997</u>
	Rs.	Rs.
<u>Items of cash and cash equivalents</u>		
Balance at bank	8,473,438	2,841,044
Petty cash balance	12,500	12,500
Cash in hand	24,403	10,933
Balance of the savings account	4,560	4,168
	<u>8,514,901</u>	<u>2,868,645</u>

2.5 Comments on Accounts

2.5.1 Accounting deficiencies

The following accounting deficiencies were observed.

- (a) The rupee value of the sum of US dollars 434 obtained by sale of publication to foreigners had not been determined at the prevailing rate and the amount receivable and income accounted for.
- (b) The income of Rs.245,806 earned by selling "Purna Package" had been shown in the accounts as creditors instead of being accounted for, as income.
- (c) The Foundation had purchased with reservation for copyrights a "Purna Integrated Library System" for Rs.50,000. Action had been taken to continue with the sales utilizing the ownership. But, instead of accounting this value as a capital asset, it had been set off against income as an expenditure of the year.
- (d) The entire grant released to universities and other institutions for research activities had been accounted for, as an expenditure of the year under review. But a test check revealed that out of the sum of Rs.3,502,720 so released, a sum of Rs.2,980,166 only had been spent by the institutions concerned.

2.5.2 Unreconciled control accounts

The balances of four control accounts amounting to Rs.692,983 had not been reconciled with the corresponding balances of Rs.715,199 in the subsidiary registers.

2.5.3 Unexplained differences

According to the accounts, the balance of Treasury deposits was Rs.46,570,198. However, the amount confirmed by the Treasury was Rs.34,119,679. Explanations had not been furnished in respect of the difference of Rs.12,450,525.

2.5.4 Lack of evidence for audit

Fixed assets valued at Rs.17,137,149, stocks amounting to Rs.734,148 imprests released to researchers amounting to Rs.327,378, debtors amounting to Rs.375,265, creditors amounting to Rs.1,523,189, expenditure of Rs.9,975, prepayments of Rs.705,385 and deposits receivables amounting to Rs.70,109 could not be satisfactorily vouched or accepted in audit due to lack of related board of survey reports, registers of fixed assets, confirmations and paid vouchers.

2.5.5 Non compliance with laws, rules, regulations and management decisions.

The following non compliances were observed in audit.

<u>Reference to laws, rules, regulations etc.</u>	<u>Particulars</u>
(i) No. 3(3)	A projected income and expenditure account and a balance sheet had not been submitted with the budget for 1998.
(ii) Section 13(5)(b)	Reports, as determined by the Auditor General in respect of stocks, stores, debtors and creditors had not been furnished.
(iii) Section 13(5)(d)	The annual reports, as determined by the Auditor General had not been furnished to the Auditor General in respect of internal audit.
(iv) Section 13(6)	A report pertaining to accounts, as determined by the Auditor General had not been furnished with accounts.
(v) Section 12	Accounts had not been prepared on the general format prescribed by the Treasury.
(b) <u>Establishments Code</u>	
Cap. VIII Section 10.3	There were 6 instances where authority to work at week ends and on public holidays had not been obtained. A register showing the details of work performed had not been maintained.

(c) Financial Regulations

- (i) F.R. 104(2) Reports to be furnished in regard to accidents to vehicles had not been furnished.
- (ii) F.R. 1664 Vehicle log books in form general 267 had not been maintained.

(d) Treasury Circular
No.37/94 of
20 April 1994

The Auditor General and the Director General of External Resources had not been informed of the particulars of gifts and donations obtained as foreign aid.

(e) Public Administration
Circulars

- (i) No.41/90 of
10 October 1990 Consumption of fuel by vehicles had not been tested by the Foundation.
- (ii) No.7/92 of
18 February 1992 The Chief Accountant and two Directors of the Foundation had used official vehicles to travel between residence and office without obtaining approval from the Ministers of Cabinet.
- (iii) No.7/97 of
3 February 1997 Payment for work on public holidays had been obtained without the approval of the Secretary to the Ministry.

2:5.6 Transactions not supported by adequate authority

(a) According to Public Enterprises Circular No 95 of 14 June 1994, employees could be paid as allowances the benefits specifically approved by the Ministers of the Cabinet, Ministry of Public Administration or the Treasury only, with the approval of the board of control concerned. However, officers and employees of the Foundation had been paid the following allowances without specific approval.

Year	Bonus	Medical leave allowances	Medical treatment allowances
	Rs.	Rs.	Rs.
1995	794,966	392,327	39,969
1996	622,598	443,913	46,170
1997	647,296	516,340	56,558
1998	641,540	619,441	47,071

(b) A sum of Rs. 7,898 had been paid out of the funds of the Foundation during the year under review to settle a bill of a private mobile telephone of a director of the Foundation.

3. Financial and operating review

3.1 Financial results

(a) The financial results of the activities of the Foundation for the year under review had resulted in a deficit of Rs.5,526,027 as compared with the previous years deficit of Rs.5,326,854 showing a further deterioration in financial results by Rs.199,173. This can be analysed as follows.

	Variance		Rs.
	<u>Favourable</u> Rs.	<u>Adverse</u> Rs.	
<u>Income</u>			
Foreign aid - Receipt in respect of administrative cost	-	750,000	
Sale of publications	11,247	-	
Interest on loans	-	52,361	
Supply of printing services to outsiders	-	15,251	
Receipts from photocopies	31,887	-	
Miscellaneous	24,837	-	
Income from bibliography unit	48,022	-	
Overprovision for doubtful debts	27,578	-	
Commission received	9,664	-	
Government grant for recurrent expenditure	2,009,140	-	
	<u>2,162,375</u>	<u>817,612</u>	1,344,763
<u>Expenditure</u>			
Office administration	139,588	-	
Salaries of staff	-	1,579,350	
Board of control	786	-	
Others	-	104,960	
	<u>140,374</u>	<u>1,684,310</u>	(1,543,936)
Net deterioration in financial results			<u>(1,991,173)</u>

It is a regular feature of the Foundation that the financial results and financial position disclosed in the accounts for a certain accounting period gets adjusted for the accounting errors, omissions etc. observed in the ensuing years. As an example, the net deficit for the previous year had been adjusted by Rs. 114,958 during the year under review. Such adjustments made during the past 6 years are shown below.

Year	Financial results as per accounts	Adjustments during ensuing years	After adjustments (Deficit)
	Rs.	Rs.	Rs.
1991	(2,870,487)	(42,276,885)	(45,147,472)
1992	(3,800,520)	(63,901)	(3,864,421)
1993	(4,384,152)	(379,802)	(4,743,954)
1994	(4,789,206)	(1,597,228)	(6,386,434)
1995	(2,232,285)	(228,947)	(2,461,232)
1996	(7,040,619)	(61,925)	(8,978,694)

It cannot be said that adjustments could not be made in future years in respect of the financial results for the year under review.

3.2 Project administration

The following deficiencies were observed at a test check carried out in relation to research projects operated by the Foundation.

(a) Non remittance of balance money in spite of completion of the project

Though the project had been completed, the balance money in respect of the following projects had not been remitted to the Foundation.

Institution	Value Rs.
University of Colombo	241,393
University of Kelaniya	62,931
University of Sri Jayawardenepura	45,363
University of Peradeniya	18,453
Medical Research Institute	101,100

(b) Cancellation of projects

It was observed in audit that the following expenditure incurred in respect of the following projects had become fruitless due to cancellation of researches pertaining to projects for various reasons.

<u>Project No.</u>	<u>Institution</u>	<u>Value</u> Rs.
95 P/2	University of Colombo	211,833
96 B/3	Basic Educational Institute (Kandy)	107,391
95 B/1	Institute of Science and Technology	280,100
96 M/3	Ministry of Health	68,700

(c) Non rendition of reports on the due dates

Though the specified date for sending the reports on completed projects had passed, reports regarding the following projects had not been sent on the dates specified.

<u>Project No</u>	<u>Date on which report to be sent</u>	<u>Period of Delay</u> (As at 30 June 1999)
		<u>Years</u>
RP/93/M/4	March 1997	2 1/4
RF/IS/96/3	November 1997	1 1/2
RP/95/BT/2	June 1997	2
RP/95/BT/6	September 1997	1 3/4
RP/97/M/7	July 1997	2

(d) Retention of money in hand

Money released to research projects which had been cancelled had been retained without being sent to the agency institutions, as shown below.

<u>Project No.</u>	<u>Amount Released</u>	<u>Year of release</u>	<u>Date of settlement</u>
	Rs.		
95-BT-7	55,900	1995	27 August 1997
95-LF-10	566,250	1995	20 June 1994
95-C-15	93,900	1996	4 August 1997

3.3 Idle asset

The Foundation had purchased sea shells for Rs.650,000. These remained in the stores for over 1 1/2 year without being used.

3.4 Identified losses

The aggregate value of losses identified in audit was Rs.122,396.

3.5 Vehicle utilization

The Foundation owned 17 vehicles during the year under review. Of these, 9 vehicles had been allocated for office work and 8 vehicles had been released for research projects. The cost of fuel consumed and the cost of repairs were Rs.319,318 and Rs.483,339 respectively. The particulars regarding the distance performed by each vehicle, the quantity of fuel consumed, the cost of fuel, expenditure on maintenance and repairs etc., had not been furnished to audit and as such vehicle utilization could not be evaluated.

3.6 Cost of Personnel

The particulars of staff, normal and overtime cost and the average cost per employee of the 1st quarter for the year under review compared with those of the previous year are given below.

Category of staff	Number		Normal Salary cost				Overtime				Average cost per employee			
	1998	1997	1998 Rs.	1997 Rs.	1998 Rs.	1997 Rs.	1998 Rs.	1997 Rs.	1998 Rs.	1997 Rs.	1998 Rs.	1997 Rs.		
Executives	26	32	5,210,600	4,902,400	13,903	5,220	200,408	146,638	535	163				
Clerical and allied grades	47	47	4,660,200	3,984,300	18,734	6,180	97,026	84,347	271	110				
Minor employees	19	19	1,367,300	1,108,500	155,022	131,076	71,437	58,393	8,717	6,899				
	92	98	11,238,106	9,795,600	192,289	141,476	170,958	169,649	2,090	1,444				

3:7 Corporate Plan

A corporate plan for the Foundation had not been prepared in terms of Section 7(1) of the Finance Act and circular No.52 of 16 June 1989.

3:8 Budgetary control

Significant variations were observed between the estimated and actual income and expenditure. It was observed that the budget had not been utilised as an effective instrument of management control during the year under review.

4 Systems and controls

Deficiencies observed during the course of audit were brought to the notice of Chairman of the Foundation by my detailed report in terms of Section 13(7)(a) of the Finance Act.

Special attention is needed in respect of the following areas of control.

- (a) Cash
- (b) Debtors and creditors
- (c) Assets
- (d) Advances
- (e) Research projects
- (f) Accounting

Sgd. S.C. Mayadunne
Auditor General.

2:5 Comments on Accounts

2:5:1 Accounting Deficiencies

a) Sale of Publications - Funds received in foreign currency
Our procedure is to enter the foreign currency value in the receipt cash book at the time we issue the receipt. Once the cheque is realized we account for the realized rupee value. If the cheques are not realized within the current year, we transfer this amount to our Debtors account.

b) & c) PURNA Package - Necessary adjustments were made in 1999

d) Research Grants - Our procedure of funding Research Grants is that we treat the funds transferred to grantee's institution as expenditure. At the time of completion of the project, we create debtors for the balance funds. We have been following this procedure since 1992 for the research grants for which funds are transferred to the grantee's institution.

2:5:2 Un-reconciled Control Accounts

The difference reported is incorrect. The correct difference is only RS. 6,079/=. The RS. 6,000/= is under SAREC (Sida) Cash Advances. This was due to a Journal voucher being entered twice. This RS. 6,000/= had been corrected.

Necessary adjustments have been made in 1999 for the RS. 79/= under Sundry Debtors.

2:5:3 Unexplained differences

Comment has been noted. It had been rectified in 1999.

2:5:4 Lack of evidence for the Audit

The Board of Survey Report has been received, after the Accounts were finalized. A Physical Verification has been carried out during 1999, to verify the following assets as at 31.12.98.

- 1. Equipment, furniture & fittings
- 2. Motor Vehicles
- 3. Motor Bicycles In the premises of our Institution
- 4. Push Bicycles

- 5. Miscellaneous & Accessories
- 6. Documentation equipment
- 7. Stock - Stationery & Consumables stock
- 8. Library books
- 9. Computers & allied equipment at Director Information's room, Main Computer room, Computer room & Training Centre.
- 10. Publication stock

Fixed Assets Register - We are maintaining the fixed assets registers since 1983, according to Kalamazoo system. Officers of the Auditor General's Department have checked the registers in 1998, though inadvertently stated as "not available".

Cash Imprests released to grantees - The reported figure is incorrect, Correct figure is RS. 146,570.06. Details given below.

	<i>Cash Imprest balance</i>	<i>Amount settled As at 31.12.00</i>
Research grant cash imprest -	RS. 8,087.00	7,587.00
SERC " -	1,573.00	1,000.00
SAREC " -	136,910.06	112,901.53
	RS. 146,570.06	121,488.53

RS. 9,975/= worth 03 paid vouchers

RS. 8,975/= - As stated in our reply for the 13(7) a report, the two vouchers have been filed in the relevant box files.

RS. 1,000/= - The relevant cheque has not been released.

RS. 9,975/=

Confirmations from Debtors - We request for confirmations, but very few replies are received.

Prepayments - Our prepayments are mainly for Insurance, Service agreements, prepayments for franking machine, membership fees for International Scientific Organizations, hence confirmations are not necessary.

Confirmations from Creditors – Our creditors are mainly foreign Agencies and local bodies which have granted funds for seminars/ special Research Projects. Hence obtaining confirmations are not necessary

2:5:5 Non compliance with Laws, Rules, Regulations & Management decisions

- (a) (i) No. 8 (3) Budget – Budget is prepared according to the format given by the Ministry/ General Treasury each year.**
- (ii) Section 13 (5) (b) – As in previous years we have given details along with our Final Accounts stocks (Please refer schedule – 3 of Final Accounts), Debtors (Please refer Schedule – 4 of Final Accounts) and Creditors (Please refer No. 3.1 of Final Accounts).**
- (iii) Section 13(5)(d) – A copy of all correspondence in respect of Internal Audit was forwarded to the Auditor General dated 21.01.99 relating to accounts 1998, signed by the then Acting Director.**
- (iv) Section 13(6) – Copies of the Annual Report (draft) for the 1998 has been Sent to Secretary, Ministry of Science & Technology with a copy to Auditor General.**
- (v) Section 12 – We have prepared our Accounts as per the format we have been preparing for the last so many years.**

b) Establishment Code

- (i) A complete file is maintained in respect of the over time work. Names of the officers, date and time and the work in detail are recorded in this file together with the approval. It would have been produced if it had been requested.

c) Financial Regulations

- (i) Accident - The relevant Police Station has been informed regarding the accident and an estimate has been obtained from the agent of the vehicle. Also the arrangements had been made to reimburse the cost of charges from Sri Lanka Insurance Corporation.
- (ii) Files have been maintained (for each vehicle) to record all the necessary information regarding vehicles, which satisfies the requirement of the log book.

d) Treasury Circulars

These books are not received under any donation scheme or grant. They are sent as free publications.

e) Public Administration Circulars

- (i) It was noted to follow this procedure in the future.
- (ii) Transport facility is provided only for senior officers (Officers in Grade I)- The Board approval had been granted for this arrangement.
- (iii) Secretary to the Ministry has granted approval for certain employees to work overtime for more than 20 hrs. limit, which includes Public Holidays.

2:5:6

Annual Payment

We have been acting as the administration centre for funds on bilateral research collaboration on behalf of the SIDA (former SAREC) organization & the Sri Lankan Government since 1982. Accordingly funds had been spent on various research & development programmes through NARESA. Therefore SAREC organization which provides funds for bilateral research collaboration and the NARESA as the Institution which administers the funds and monitors the research programmes have agreed to allocate a small amount of funds for the administration of these projects. Approval has been obtained from the Dept. of External Resources for this. Annual payment is made out of these foreign funds with the approval of the Board of Management since 1991.

Encashment of Medical Leave

Since 1984 NARESA has been paying its employees for unavailed sick leave according to the basis given in circular No.326 of 23-11-83 of the then Ministry of Industries and Scientific Affairs on the approval of the Board of management.

Medical Assistance Scheme

Medical Bills for the value of RS. 500/= per employee per year is reimbursed. This is paid with the approval of the Board of Management as far back as, 1994.

Mobile Telephone bills payment

RS. 7898/= - The Director NSF is entitled for a residential telephone. Since it was not possible to obtain a telephone for her soon, we made arrangements to reimburse the maintenance cost of the mobile T'phone she was using.

3. Financial & Operating Review -

Two figures are given in the report as net deterioration in Financial results as RS. 199,173/= and RS. 1,991,173/=.

3:2 Project Administration.

a) Non remittance of balance money inspite of completion of the project.

University of Colombo - RS. 201,393/= has been settled out of the RS. 241,393/= reported.

University of Kelaniya - According to the Auditor General's 13(7) (a) & 14(2)(c) reports only RS. 29,642/= was stated as non remitted. This RS. 29,642/= has been refunded in year 2000. If the grant Nos. of the balance amount was stated we could have reported.

University of Peradeniya - Amount to be refunded is RS. 17,467/=

University of Sri Jayawardenepura -

RG/93/B/01 - 21,004/= Refunded in year 1999

RG/95/P/01 - 21,156/=

RG/95/NR/01 - 3,203/= Reimbursement grant. Hence refund of funds does not arise.

45,363/=
=====

Medical Research Institute - Funds have been refunded in year 2000

Cancellation of Projects

Grants are terminated on the recommendation of the relevant working committee. The committee recommends the termination after considering all facts forwarded by the grantee. However if NSF or the committee finds that the

grantee's conduct is not good or there is misuse of funds, the Committee recommends that the funds utilized for the conduct of the research project, should be refunded.

b) Non rendition of reports on due date

Grant Nos. stated by the Auditor General incorrect

- RG/93/M/04 - Final report received in July 1999 and was accepted as satisfactory by the working committee on Health Sciences.**
- RG/IS/96/03 - This grant was terminated by the Board of Management of NSF.**
- RG/95/BT/02 - Grant period extended upto Sept. 99**
- RG/97/M/07 - Comment not correct. This grant was awarded for a 2 year period in September 1997.**
- RG/95/BT/08 - Report received.**

c) Retention of money in hand

Funds have been refunded by the relevant institutions in the year, during which the grants were terminated. Auditor General's comment is incorrect.

3:3 Idle Asset

Sea shells collection

The statement is not correct. Seashells did not remain in the stores for over 1 ½ years. This collection has been identified scientifically and a computerized data base has been prepared during this period. This collection was handed over to the National Museum for the use of Scientists to be displayed for the General Public.

3:4 Identified Losses

Library Books - RS. 8,342/= As stated in our reply to 13(7) a Report we have accounted for this RS. 8,342/= under Debtors, hence it is incorrect to state that we have not accounted for it.

Diesel Tax - RS. 2,500/= - Because of the Postal Strike the relevant documents were not received by us for renewal of Insurance Policy. Hence there was a delay to pay the diesel tax and the extra payment had to be made.

Auditorium hiring charges RS. 43,000/= - The previous management has allowed the Sri Lanka Library Association to use the Auditorium on certain days at a concessionary rate since the event was relevant to NSF functions.

Bond - RS. 68,554/= the relevant officer had made a request to transfer this bond to the University of Colombo, where he is presently employed. The Board of Management did not consider his request and decided that he pays the balance due to NSF. He has been informed of this decision.

3:5 Vehicle Utilization

The relevant running charts had been provided for the Audit, In addition other information was provided on the format sent by the Auditors.

3:7 Corporate Plan

The existing Corporate Plan is for the period 2001-2005.

Although we did not have one for 1998, we had a plan for 1995- 2000.

3:8 Budgetary Control

The Budget is prepared almost one year before the expenditure is incurred.

Subject to this limitation, the budget is used as an instrument of control as far as possible.

04. Systems & Controls

Auditor General's Comments on Section 13 (7) (a) of the Finance Act received our attention. Our reply to these comments were forwarded to the Auditor General on 13th October 1999.