

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

26-12-2000.

Hon. Minister of Science & Technology,
Ministry of Science & Technology,
320, T.B. Jayah Mawatha,
Colombo 10.

Honourable Sir,

**Annual Report of the Natural Resources, Energy & Science Authority of Sri Lanka
For the Period 1st January to 31st December 1996**

In terms of Section 16(III) of the Natural Resources, Energy and Science Authority of Sri Lanka Act No. 78 of 1981, I have the honour to submit the Annual Report of the Natural Resources, Energy and Science Authority of Sri Lanka for the period 1st January to 31st December 1996 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

CONTENTS

1.	Introduction	1
2.	Special Activities	2
3.	Sponsorship of Scientific Research	3
4.	Review of Significance of Research Findings	6
5.	Communiques sent to Respective Institutions	12
6.	Publications and Periodicals	13
7.	Awards for Scientific Achievements made during the year	15
8.	In-House Support Activities	20
9.	Research Co-ordination Activities	22
10.	Sri Lanka Scientific and Technical Information Centre (SLSTIC)	27
11.	Scientific and Technical Committees	37
12.	Commonwealth Science Council (CSC)	41
13.	International Contracts Fund	43
14.	Tables - New Grants Awarded in 1996	48
	Grants Sponsored by NARESA	61
	Grants Sponsored by Foreign Agencies	62
15.	Balance Sheet	63
16.	Auditor General's Report	72
17.	Comments on the Auditor General's Report	93

Introduction

Natural Resources Energy and Science Authority (NARESA) was established by Parliamentary Act No. 78 of 1981 on 01/01/1982. It is the successor to the National Science Council (NSC) which was set up by Act No. 9 of 1968 on 28/02/1968.

NARESA was then brought under the umbrella of His Excellency the President, but is now under the Ministry of Science, Technology & Human Resources Development.

The main objectives of NARESA are :

to advise the Hon. Minister of Science and Technology regarding

- i. Measures for the promotion and development of self-reliance in the application of S&T for the benefit of the people of Sri Lanka.
- ii. Policy and measures for the management and development of the natural resources of Sri Lanka in a manner consonant with national interests.
- iii. Allocation of funds for the development of natural resources, energy resources and for scientific and technological research.
- iv. Initiation, sponsoring and support of S&T research with the following objectives:
 - (a) the development of the resources of Sri Lanka,
 - (b) the promotion of the welfare of the people of Sri Lanka and
 - (c) the advancement of S&T in general in Sri Lanka.
- v. Collection, collation and dissemination of information, publication of reports, periodicals and papers relating to natural resources and their systematic and co-ordinated exploitation and development, the exploitation and use of energy resources and the conservation of energy and other aspects relating to Science & Technology and education of the public thereof.
- vi. Establishment and maintenance of liaison with individuals, associations or institutions in Sri Lanka and in other countries relating to the development of natural resources, and conservation and development of energy and other areas of Science & Technology.

Adhering to the above defined objectives, the work has been expanded with an allocation of Rs. 18,175,000 as the capital expenditure for scientific research during 1996.

Special Activities

Highlights of the Year under Review

1. Science and Technology Policy Document

The Science and Technology Policy document which had been handed over to Her Excellency the President, was discussed by Her Excellency with the Hon. Minister of Science, Technology & Human Resources Development and members of the Board of NARESA. A brief document in English and Sinhala explaining the meaning of the policy document was requested by Her Excellency for distribution to the public.

It was stated by Her Excellency that there should be inter-ministerial discussions with the agricultural and the industrial development sectors.

2. Criteria for Research Collaboration in Biodiversity

A request was made by the Ministry of Transport, Environment and Women's Affairs, for Criteria for Research Collaboration in Biodiversity. NARESA appointed a special Committee to formulate these criteria. A draft of the criteria was prepared by the Committee. The Committee members :

Dr K.D. Arulpragasam
 Prof. B.A. Abeywickrama
 Dr P. Ganashan
 Prof. F. P. Amarasinghe
 Prof. H.D. Gunawardena
 Prof. V. Kumar
 Prof. I.A.U.N. Gunatilleke
 Mr H.M. Bandaratileke
 Dr G. Jayawardene
 Dr S. Kotagama
 Prof. K. Mendis

3. The Zoological Survey of Sri Lanka (ZSSL)

The Board of Management decided to resurrect the idea of the Zoological Survey, which had been a NARESA activity in the past. Preliminary steps were taken for the establishment of a Zoological Survey of Sri Lanka (ZSSL), a long felt need.

A Committee was appointed by the Board of Management to work out the logistics and a plan of action.

The Committee members :

Dr K.D. Arulpragasam
 Prof. H.H. Costa
 Prof. W.R. Breckenridge
 Prof. F.P. Amarasinghe
 Dr C.R. Panabokke
 Mr Lyn de Alwis

4. Information Technology

Besides the usual work on research and other scientific activity, NARESA's thrust during 1996 has been on utilizing Information Technology.

Under a grant from the Swedish Agency for Research Co-operation in Developing Countries (SAREC), a Local Area Network (LAN), E-mail facilities and INTERNET communications were established for the exchange of S&T information. CD-ROM databases were purchased for provision of information on the computer network to scientists.

5. Research Grant Allocation

NARESA received an increased research grant allocation in 1996. However, there were constraints to all activities because of budget cuts.

Sponsorship of Scientific Research

The Research Grants Scheme

Applications were invited for grants for research projects by advertisements in the national press. Applications received were evaluated by the Steering Committees and recommendations made on a priority basis for approval by the Board of Management and awarded during the year. Details of the Research Grants awarded are given in Tables annexed.

Information on research projects funded by NARESA was submitted to relevant ministries.

Progress Review Seminars for the NARESA grantees

Discipline	Date	No. of participants
Biotechnology	20 th December	25
Medical & Vet. Sciences	05 th July	09
Biological Sciences	07 th June	25

Highlights of Measures taken for Enhancing Self-reliance in Science and Technology

In order to enable scientists/researchers to share experiences, to update knowledge and also to provide fora for discussions the following seminars and workshops were held during the year 1996.

Date	Theme
23 February	Getting Research into Practice ("GRIPS") Venue - NARESA Number of Participants - 68 Number of Resource Persons - 03

- 19-22 March Regional Seminar on the Forests of the Humid Tropics in South & South-East Asia
Venue - Hotel Topaz, Kandy
Number of Participants - 60
Number of Resource Persons - 28
- 4-9 April International Seminar on Problems of Monitoring Pesticide Residues in Exportable Commodities viz. rice, fish and minor crops
Venue : Hotel Galadari, Colombo
No. of Participants - 30
No. of Resource Persons - 15
- 27 April Research Seminar on Social Science Grants
Venue - NARESA
Number of Participants - 15
Number of Resource Persons - 08
- 20 June Problems Associated with Cold Storage of Pineapples with reference to Export of Fruits to European and Other Markets
Venue - NARESA
Number of Participants - 30
Number of Resource Persons - 03
- 26 July New Information Technologies in collaboration with CARP
Venue - NARESA
No. of Participants - 46
No. of Resource Persons - 04
- 13 September Silicate Based Industries - Future Prospects
Venue - NARESA
Number of Participants - 30
Number of Resource Persons - 04
- 20 September Seminar on Agricultural Biotechnology in Sri Lanka
Venue - NARESA
Number of Participants - 53
Number of Resource Persons - 07
- 28 September Socio-economic Factors Impeding Sustainable Development
Number of Participants - 25
Venue - NARESA
Number of Resource Persons - 06
- 9-10 October Regional Workshop on Research for the Management of Coastal Resources in the Tropics
Venue - NARA
No. of Participants - 55
No. of Resource Persons - 10

25 October	Perspectives in Biotechnology Venue - NARESA Number of Participants - 80 Number of Resource Persons - 08
08 November	Library Day Seminar: Utilization of IT Resources in Exchange of Information in Developing Countries in collaboration with SLLA and the British Council Venue - British Council No. of Participants - 80 No. of Resource Persons - 04
11-15 November	Symposium on Bioactive Natural Products Venue - Hotel Tree of Life, Kandy No. of NARESA Grantees Participated - 07
13 December	Modern Information Retrieval Techniques for Biological Scientists in collaboration with Institute of Biology Venue - Sri Jayewardenepura University No. of Participants - 30 No. of Resource Persons - 03

Public Awareness Seminar Series "Science for Everyday Life"

In keeping with its policy to create public awareness and interest among school children a series of seminars was conducted by NARESA on the central theme of 'Science for Everyday Life'. This was an activity conducted through the Steering Committee on Science Education.

The objectives of this series are to create a general awareness of the usefulness of science and to educate selected sectors of the population on the use of science and simple technologies to enrich life and living. Six seminars were held islandwide during the year on "Landslides", "Environmental Conservation" and "Climate Change and Environment".

10 February	Landslides a) Venue - Aruggammana Vidyalaya, Aruggammana Participants - School teachers, students, samurdhi officers No. of Participants - 170 No. of Resource Persons - 03
22 March	b) Venue - Kachcheri, Matale Participants - Heads of institutes, regional secretaries, grama seva niladharis No. of Participants - 90 No. of Resource Persons - 03

- 24 May c) Venue - St. Joseph's College, Bandarawela
Participants - School teachers, students
No. of Participants - 250
No. of Resource Persons - 03
- 27 January **Environmental Conservation**
a) Venue - Sri Parakrama Maha Vidyalaya, Arukgoda,
Alubomulla
Participants - Teachers , students
No. of Participants - 130
No. of Resource Persons - 03
- 29 June **Climate Change & Environment**
b) Venue - Royal College, Polonnaruwa
Participants - Teachers, students, grama seva niladharis,
samurdhi niladharis
No. of Participants - 130
No. of Resource Persons - 02
- 15 November c) Venue - Royal College, Horana
Participants - Teachers, students, grama seva niladharis,
samurdhi niladharis
No. of Participants - 370
No. of Resource Persons - 02

Review of Significance of Research Findings

1. Investigations on the Field use of the Natural Attractants for *Leucinodes orbonalis* and *Rhynchophorus ferrugineus*

Use of an aggregation pheromone of *R. ferrugineus*, a coconut pest was found to be a practical way of controlling this insect. The use of the pheromone mixture ferrugineol and pentanol (1:1 v/v) offers an economical (cost approximately. Rs.30/= baited trap), environmentally sound, long lasting bait for the control of the adult red weevil population in coconut plantations. These findings were patented in Sri Lanka (Sri Lanka - No. 10811).

Title of invention: A chemical attractant system and a method to trap the adult coconut pest, *Rhynchophorus ferrugineus*.

In recognition of this achievement the grantee Prof.(Mrs) N.E. Gunawardena, received the Presidential Award for inventions 1996.

2. **Isolation and Characterization of Antifungal and Antibacterial Compounds from Thermophilic Fungi**

An antifungal compound bis-azasugar, was isolated from the extract of *Aspergillus fumigatus*.

Thermophilic fungi were isolated and identified from straw and oyster compost samples which are used to cultivate mushrooms at the Export Development Board (EDB) Research Station, Ratmalana. The fungus *Aspergillus fumigatus* was cultured in yeast starch liquid medium and the above antifungal sugar was isolated by activity directed fractionation.

Antibacterial assay was performed on *Streptococci*, *Staphylococci*, *Klebsiella* and *E. coli* using 40 µg, 20 µg and 10 µg levels.

3. **Laboratory Model Study and a Survey to Select a Suitable Area for Ocean Wave Energy Plant in the South and South Eastern belt of Sri Lanka**

The Southern coastal belt from Galle to Palatupana was surveyed for suitable sites for oscillation water column type ocean wave energy plant. Three sites, Unawatuna, Bundala, Palatupana had been selected and data on waves, tides, wind and coastal topography were obtained at these sites from February 1994 to April 1995. It was found that Unawatuna was the most suitable site for a plant of the said type.

The data obtained from the sites were applied to a model of an oscillation water column in a laboratory to estimate the possible output from the sites.

The maximum possible energy potential was calculated to be of 13-14 Kw per linear meter.

4. **Swedish International Development Co-operation Agency (SIDA) Research Programme on Renewable Energy and Energy Efficiency**

Solar Energy in Tea Drying Process

After testing different materials like wood, Zinc and Alum for the collector with double and single glazing, a suitable design for the collector was finalized. In the final design of the collector, the outer frame consists of Zinc-Alum, the absorber plate fabricated using GI roofing sheets coated with black paint and with single glazing.

Work on the next step for the fabrication of 200 solar collectors was initiated. The solar collectors will be installed adjacent to the factory.

Mr S. Koneswaramoorthy, the Research Assistant of the project followed a training course under the postgraduate(Ph.D) programme at the Royal Institute of Technology (KTH), Sweden for four months from August to November 1996.

Dr A.N.S. Kulasinghe provided consultancy services for the project.

5. **Energy Efficiency in Buildings**

A comprehensive progress report on lighting, thermal efficiency and building codes was submitted to SIDA.

The Research Assistant Mr Harendra Fernando, visited the Royal Institute of Technology, Sweden to submit the thesis based on the work done on Lighting research for his "Licentiate" degree and to follow other courses of the programme.

Mr Jeevan Jayasooriya, research student got registered for a M.Sc Programme at the Asian Institute of Technology (AIT) , Bangkok.

6. **Pilot Project on "Disposal of Market Garbage by Anaerobic Digestion producing Fertilizer and Biogas"**

This project was initiated at the special request of the Hon. Minister of S,T & HRD in 1995. The construction work of the above project was carried out by the State Engineering Corporation (SEC) under the guidance of the National Engineering Research and Development Centre (NERD) and the Division of Alternate Sources of Energy of the Ministry of Science, Technology & Human Resources Development.

The construction of five digestors of 30 ton capacity each has been completed. The diaphragms of the digestors will be tested.

7. **Detection and Typing of Human Papillomavirus DNA in Cervical Intra-epithelial Neoplasia and Carcinoma in a Cohort of Sri Lankan Women**

Squamous carcinoma of the cervix is one of the commonest malignancies of women. It is the second most common malignancy in Sri Lankan women. On the basis of epidemiological investigations, a sexually transmitted agent is believed to be involved in its aetiology. The objective of the present study was to determine the incidence of human papillomavirus types 16 and 18 in squamous carcinoma of the cervix.

HPV 16 DNA was detected in 11 of 15 (73.3%) cervical cancer biopsies, in comparison with 3 out of 15 controls HPV 18 was detected in 3 of 15 (20%) cervical cancer biopsies but not in a single control biopsy. Three patients had mixed infections.

Patients with cervical cancer had begun sexual activity earlier and have had more pregnancies than women in the general population.

8. **Prevalence and Nature of Perimenopausal Symptoms in Sri Lankan Women**

The objectives of study were to determine the pattern and prevalence of perimenopausal symptoms (PMS) and to find out the influence of housework, employment outside the home, social life and other factors on PMS.

An overwhelming majority (87.1%) of the 723 women interviewed had PMS, the chief of which were insomnia, night sweats, joint pains, hot flushes, irritability, headache and

dizziness. Prevalence of PMS was not significantly related to marital status, income or education level. In 62.3% PMS interfered with housework and in 19.2% with social life, and 45.2% of women had sought treatment for PMS.

9. **Validation of *Aedes* Larval Surveillance Against *Aedes* Ovitrap Surveillance for the Monitoring of *Aedes aegypti* (Linnaeus) and *Aedes albopictus* (Skuse) Populations in a Colombo Suburb**

The dengue fevers are a major public health problem in Sri Lanka causing much morbidity and mortality particularly in the younger age groups. An essential component of control of dengue transmission is vector surveillance. Currently only larval sampling techniques are in routine use for vector surveillance in Sri Lanka. The objective of the study was to introduce a new technique to monitor dengue vector breeding and to compare this technique with that in current use in Sri Lanka. The study was carried out from 15th July 1995 to 15th October 1995 in the Dehiwala Medical Officer of Health area. Both larval and ovitrap surveys were carried out in 220 houses on nine rounds at ten days apart.

The study showed that the ovitrap surveillance technique was more sensitive and more cost-effective than larval surveillance in detecting *Aedes* breeding both indoors and outdoors, in houses in a dengue transmission area in Sri Lanka, indicating the former technique to be of higher predictive value as a warning signal in dengue epidemics for use in control programmes. However, the larval surveillance technique is of value as it showed the types of container habitats and as such is important in health education programmes for the prevention of *Aedes* breeding. Results also showed *Ae. albopictus* to be the predominant species in Colombo suburbs.

10 **Some Epidemiological Aspects of Infertility in the District of Colombo**

This study has shown that primary infertility is a problem in Sri Lanka. Efforts to reduce factors associated with primary infertility may be important considering the fact that treatment of infertility is costly. Education of both men and women on the devastating effects of postponement of child bearing should be considered in reproductive health programmes.

The secondary infertile women were seen to have a high prevalence of post partum and post abortion infection. In view of this in depth studies to identify factors that lead to this situation should be undertaken. Furthermore, steps should be taken to reduce the need for women to resort to induced abortion.

Although the prevalence of primary infertility can be considered low in comparison to other reproductive failures, it is often an important emotional and social stigma leading to certain psychological phenomena as shown in this study. In this respect providing psychological support such as counselling in addition to gynaecological assessment is necessary in the management of infertility. Since the cost of providing advanced infertility services in developing countries is costly, accessibility of the basic facilities at the primary care level and one center of excellence where advanced techniques of diagnosis and management are available may be a feasible option.

11. Prevalence, Bacteriological Aetiology and Antibiotic Susceptibility Pattern of Asymptomatic Bacteriuria in Pregnancy

The study was designed

- (i) to determine the prevalence, bacteriological aetiology and antibiotic susceptibility pattern of bacteriuria in pregnancy.
- (ii) to find the correlation of the currently practised microscopic examination of the centrifuged urine deposit with standard urine culture, and
- (iii) to determine the effect of the following host factors on the incidence of significant bacteriuria in pregnancy - age, parity, past history of UTI (urinary tract infection), past history of catheterization and socio-economic status.

The prevalence of asymptomatic bacteriuria in this study group was 3.7%. Coliform organisms were the most common aetiological agents in asymptomatic bacteriuria in pregnancy of which *Escherichia coli* predominates.

Nitrofurantoin could be considered as the drug of choice (as cephalexin is more expensive) with a 95% sensitivity.

Pyuria on urine microscopy is a poor predictor of positive urine cultures in asymptomatic bacteriuria in pregnancy.

Of the host factors evaluated only the past history of urinary tract disease showed a statistically significant correlation with the presence of bacteriuria in pregnancy. Other than this, it is difficult to design a subgroup at high risk.

12. Testing the Efficacy of Organ Preservation Solutions using Metabolic Function tests on Stored Tissue

The objectives of this study were to determine the

- (i) efficacy of "low cost" organ preserve solution using metabolic function test on animal kidneys after storage at low temperature
- (ii) the feasibility of preserving organs at low temperature for transplantation in Sri Lanka, and
- (iii) provision of facilities for organ storage in a cadaver kidney transplantation programme scheduled to commence in Sri Lanka

Conclusions drawn and recommendations made were that Vitamin E appears to offer protection to stored kidney tissue at higher doses. On this basis it is recommended that Vitamin E in calculated doses be tried in transplant recipients, prior to revascularization of the donated organ.

South Asian Association for Regional Cooperation (SAARC)

Country inputs for the following reports and directories have been compiled and forwarded to the Ministry of S,T & HRD for follow up.

State-of-the-Art Report on Building Materials and Housing Technologies

State-of-the-Art Report on Local Electronic Products

Report on Energy Modelling Techniques with special reference to Rural Areas.

Directory of specialized Analytical Instrumentation Facilities and Techniques for SAARC Region was compiled and forwarded to the Ministry to be forwarded to the SAARC secretariat.

Parliament Consultative Meetings

The Director General, the Accountant and the Administrative Secretary participated at the Parliament Consultative Meetings held at the Parliament on 24 May 1996, 25 July 1996, 19 September 1996 and 5 December 1996.

Subject of discussion:- Annual Reports and the performance review of Scientific Institutions under the Ministry of Science, Technology and Human Resources Development

Inter-institutional Linkages Development

Discussions were held with the officials and the Adviser to the National Zoological Gardens (NZG) regarding the administration of funds for research. Board approval was given to administer funds of the NZG. These funds will be used for research work relevant to the NZG.

The Man and the Biosphere (MAB) Committee visited the three islands (Kudamolliya, Mahamolliya and Kakaduwa) vested in NARESA at Kadolkele. Action is being taken to hand over the management of these islands to the Forest Department.

Publications and Periodicals

Regular Publications

- (1) Journal of the National Science Council
Vol 24 Nos 1, 2 & 3
- (2) Sri Lanka Journal of Social Sciences 18(1 & 2)
June/December 1995

Newsletters

Four issues of the NARESA Newsletter were printed. A special issue of the newsletter containing the proceedings of the presentation ceremony of the National Awards for Scientific Achievements was published in September 1996.

Proceedings of seminars

- (1) Proceedings of a seminar on "Getting Research into Practice" ("GRIPS")
- (2) Abstracts of the Proceedings of the Regional workshop on "Research for the Management of Coastal Resources" held on 9-10 October 1996.

Special Publications

Shell Beds on the Southern Coastal Zone of Sri Lanka
 Use of Potash Fertilizer in Agriculture in Sri Lanka
 Sinharaja World Heritage Site Sri Lanka
 CDS/ISIS (Sinhala)
 National S&T Policy and an Action Plan
 Fresh Water Fauna & Fisheries of Sri Lanka

The following publications were finalized and made ready for printing

Common Vegetables of Sri Lanka
 Sinharaja Rain Forest)
 Mammals of Sri Lanka) under a NARESA /March for Conservation (MfC)
 Birds of Sri Lanka) project

Vidurava - Science News Bulletin

Arrangements were made to obtain articles for the following issues

- a) Library Then and Now - Vol (18), 1/2
- b) Integrated Pest Management Systems - Vol (19), 1
- c) Indigenous Knowledge - Vol (19), 2

Trainee Journalist for Vidurava

Applicants were interviewed and a trainee journalist was appointed to work on the Vidurava.

Natural Resources Series

Manuscripts on Water Resources, Population & Manpower and Soils were edited for finalization. A new author was commissioned for the manuscript on Climate.

Revision of the Natural Resources Profile

An Editorial Committee was appointed for the revision of the publication "Natural Resources of Sri Lanka". The chapters and the intersectoral chapters which should be included in the document (complete revision) and the time frame up to the release of the book were decided upon.

Awards for Scientific Achievements made during the year

National Awards for Scientific Achievements - 1994/1995

In recognition of outstanding achievements in scientific research and development, awards are made every three years by NARESA. Awards are given also for work, the importance of which lies in its potential applications in Sri Lanka.

The selection for the above awards was made by a Panel of Judges appointed by the Board of Management of NARESA, based on the applications received in response to an advertisement in the press.

The winners of the two awards were:

- (1) **The President's Award (Gold)** - consisting of a cash prize of Rs 100,000/- and a certificate

Dr C.G. Uragoda, Post Graduate Institute of Medicine, for his work:

Contribution to Sri Lanka's (i) lung diseases; (ii) history of medicine; (iii) medical bibliography; and (iv) culture in its scientific setting.

Summary :

In the case of occupational lung diseases he has carried out a series of pioneering studies, some being the first of their kind in the world and published in prestigious international medical journals. His studies helped to focus the attention of authorities and the workers on the hazards in the industries studied. This work has brought him international recognition.

The book titled "A History of Medicine in Sri Lanka" written by Dr Uragoda is now considered the standard work on the subject. It has been translated into Sinhala and is now being translated into French.

The bibliography of medical publications relating to Sri Lanka was published in three volumes covering the periods 1811-1976, 1977-1980 and 1981-1988. These are of immense value to researchers who regularly consult them. He also has contributed to publication of medical research as the co-editor of the Ceylon Medical Journal since 1979.

His interest in Sri Lankan culture in its scientific setting led him to participate in the activities of the Royal Asiatic Society of Sri Lanka of which later he became the President. He was awarded the Society's Gold Medal in 1993 for the most outstanding contribution to its objectives during the preceding three years.

In addition to these achievements he has authored a non-medical book but of scientific interest - Wild Life Conservation in Sri Lanka.

- (2) **The NARESA Award (Silver)** - consisting of a cash prize of Rs 50,000/- and a certificate

Prof. P.G. Cooray and Dr M.M.J.W. Herath for their work on

(a) Pioneer and significant contributions to a better and greater understanding of Sri Lankan geology over the past 40 years (b) contribution to the development of science in general and geoscience in particular in Sri Lanka over the past 50 years and Contribution to the mineral based industry in Sri Lanka , respectively.

Summary :

Prof. Cooray has mapped about 2000 sq. miles of Sri Lankan terrain in the highlands, lowlands and coastal regions.

His knowledge, understanding and overall comprehension of Sri Lankan geology were incorporated in his "Introduction to the Geology of Ceylon/Sri Lanka", which is the only available full length book on Sri Lankan geology. It has become the standard reference book on the subject and is widely quoted here and abroad. He has also written many books which are ready for publication.

He has gained international recognition for his work and has over 80 articles on Sri Lankan geology published in national and international journals. Most of the concepts and interpretations of Sri lankan geology postulated by him were accepted by geologists within/and outside the country. Many still remain in current usage.

He has made valuable contributions to the development of science in general and geoscience in particular, in Sri Lanka.

The presentation ceremony of these awards by Her Excellency Chandrika Bandaranaike Kumaratunga, President of Sri Lanka was held on 19 June 1996 at the Presidential Secretariat in the presence of a gathering of eminent scientists.

Third World Academy of Sciences/NARESA Prizes for Young Scientists

TWAS/NARESA Prizes for Young Scientists are awarded annually in the fields of Biology, Chemistry, Mathematics and Physics for attainments of high levels of excellence in research work. The prize consists of US\$ 500/-.

Dr R.M.G. Rajapakse and Dr A.D.L. Chandanie were recipients of the TWAS/NARESA Prize (1995) for Young Scientist in Chemistry for their joint work on

- (i) Electro chemical studies of polyaniline/solution interface and the application of polyaniline and the polymers of aniline derivatives in the liquid-crystal display technology and in electrocatalysis.
- (ii) Electro Chemical modification of selected constituents of essential oils.
- (iii) Molecular orientational order 4-n-alkyl-4' cyanobiphenyl liquid crystals from adsorption dichroic ratios.

Summary:

Four polymers of aniline have been synthesized by potentiostatic, potentiodynamic and galvanostatic electrosynthetic methods. The conductivities of the polymers have been found to be dependent upon various factors such as the nature and PH of the electrolyte, temperature, and applied potential. This work has also shown that the liquid crystal displays constructed using polyaniline as the template, required much less voltage for complete switching of the molecules from one orientation to the other, compared to those of conventional ones, thus saving a considerable amount of power. Also in conventional fuel cells, deactivation of the electrode surfaces by the products/intermediates formed by the oxidation of organic fuels is a serious problem. The preliminary work by applicants has indicated that the polyaniline modified polycrystalline Pt surfaces resist this poisoning of the electrode. Their work on the orientation of liquid crystalline materials on electropolymerized conducting films is specially significant and may show the way to novel display devices.

The applicants have also studied electrochemical modification of selected constituents of essential oils, and synthesis of aroma chemicals from them. Successful synthesis of such aroma chemicals from local starting materials will eventually help the emerging local fragrance industry.

The presentation ceremony of these awards by the Hon. Minister of Science, Technology & Human Resources Development was held at NARESA in the presence of a gathering of Scientists, Board members and Steering Committee members.

The following were selected for the TWAS/NARESA prizes (1996) for Young Scientists.

(1) Prize for Chemistry

Ms W.M.A.P. Wanigasekera of IFS - For her work on the isolation of two new coumarins from *Calophyllum* species.

(2) Prize for Physics

Mr G.R.A. Kumara of IFS - For his work on the development of a novel dye-sensitized solid state solar cell.

Summary:

- (1) Ms Anoja Wanigasekera of the Institute of Fundamental Studies (IFS), Kandy was awarded the TWAS/NARESA Prize for Young Scientists 1996 for her work on the *Calophyllum* species of Sri Lanka.

Some coumarins isolated from *Calophyllum* species have been found to be effective against the AIDS virus, the Human Immunodeficiency Virus (HIV). They have been found to interact with the HIV-1 Reverse Transcriptase (HIV-1 RT) enzyme and thereby inhibit the replication of Virus HIV-1.

The Sri Lankan members of the genus *Calophyllum* had been extensively studied by Professor Sultanbawa and his group long before AIDS or HIV were known. Ms Wanigasekera's work which was supervised by Dr Ranjith Dharmaratne of the IFS, was concerned with re-examining the genus with a view to isolating compounds which could be used against HIV.

A pyranocoumarin isolated by her, soulattrolide has shown high activity against HIV-1 RT in the Reverse Transcriptase assay, while yet another, cordatolide B, looks promising and is under further investigation. Her work which has been published as two papers in international journals and four communications, also led to the isolation of two new coumarins from *Calophyllum* species. Ms Wanigasekera has been awarded the M.Phil. degree for her work.

- (2) The research group of Mr G.R.A. Kumara and Prof. K. Tennakone of the Institute of Fundamental Studies, Kandy has developed a novel all solid state, dye-sensitized photovoltaic cell based on a n-type, nano-porous film of TiO₂ film, and a p-type semiconducting cuprous iodide.

At present, the use of silicon solar cells for photovoltaic solar energy conversion is very much limited due to the high cost of these cells and solar panels. The high cost is attributed to the cost of manufacturing single crystals of silicon. Dye sensitized photoelectrochemical solar cells can offer a low cost technique for the fabrication of solar cells, but the liquid electrolyte in these cells leads to several technological problems including cell degradation. Research on developing an all solid state solar cell has been a challenge to Physicists, Chemists and Material Scientists for the past many years.

With 800 W m^{-2} simulated sunlight, the cell could deliver short circuit photo currents of about 5 mA cm^{-2} , and open circuit voltage of about 500 mV. The energy conversion efficiency of the cell is estimated to be 3-4% under filtered UV light.

As the major contributor for the fabrication of this solid state photovoltaic cell using dye sensitised semiconducting material which could achieve relatively high conversion efficiencies, Mr Kumara was commended by awarding the TWAS Young Scientists Award.

Fifth Sven Brohult Award

The Sven Brohult Award is given by the International Foundation for Science, Sweden, to past or present IFS grantees who have distinguished themselves by outstanding research carried out in a developing country.

Applications were invited, and processed for nomination by NARESA.

Activities of the Director General during the year

Local Activities

- Attending Board Meetings of Sri Lanka Standards Institution (SLSI)
 Post Graduate Institute of Science (PGIS)
 Council Meetings of Centre for Agricultural Research Policy (CARP)
 Monitoring Committee on Rights of Children
 Monthly Board Meetings of Post Graduate Institute of Medicine
 Board Meetings of the Centre for Women's Research (CENWOR)
 National Nutrition Co-ordinating Committee
 2nd meeting of the Consultative Committee on S,T & HRD (July 1996)
 4th Meeting of the Consultative Committee on S,T & HRD (December 1996)
- January - Chief Guest - 12th Annual Session of the Geological Society of Sri Lanka
 February - Chief Guest - Annual Conference of the Kandy Society of Medicine
 November - Chief Guest - Concluding session of annual congress of PGIA
 November - Guest of honour - Library Day Seminar, British Council
 November - Chief Guest - International Conference on Women, Land & Forestry Development
 December - Chief Guest - Inaugural Session workshop at the Institute of Biology

International Travel

- April - Guest speech at Nutrition Foundation of India, Delhi
- April - Commonwealth Science Council Executive Committee Meeting - London, UK.

- September - International Council of Scientific Unions (ICSU) - 25th General Assembly - Washington .
- December - Participation at a Workshop on Mobilizing Women, Science and Technology for Sustainable and Equitable Economic Growth - Madras India.

In- house Support Activities

(1) Staff Training

Mr W. Amaradasa attended a training course on Science & Technology Policy Analysis at the University of Sussex, UK from Oct. 1995 to March 1996. This was partly funded by NARESA (SAREC funds) and the Commonwealth Science Council.

(2) Staff achievements : Participation at Conferences, Seminars and Workshops

- 19-20 March 13th Meeting of SAARC Technical Committee on Science & Technology, Islamabad - Mr M. Watson
- 09 August Socio-economic Impacts on Climate Change- Colombo - Mr M. Watson
- 09-24 September International Workshop on "Exploitation & Utilization of S&T Information Resources in Asia & Pacific" held in China - Ms Deepali Talagala
- 18-21 September National Workshop on Commercialization of R&D Results - Colombo - Mrs. Swarna P. Prelis
- Mr M. Watson
- 11 October Web Page Designing at Univ. of Moratuwa - Ms Deepali Talagala
- 05-06 November 14th Meeting of SAARC Technical Committee on Science & Technology, Islamabad. - Mr M. Watson
- 09 November Remote Sensing - Indian Experience IFS, Kandy - Mr W. Amaradasa and Mr K. Hall
- 21-23 November National Training Workshop on Wood Fuel Utilization & Marketing at IFS, organized by UNDP under the Regional Wood Fuel Energy Development Programme - Mr A.W.J. Karunasinghe

Participation in Committees by Staff Members

1. Formulation of TOR for a Feasibility Study on Policies for the Development of Alternative Sources of Lime - Coastal Resources Management Project.
- Mr M. Watson
2. Inter-Agency Coordinating Committee on Sustainable Use of Coastal & Marine Resources - Ministry of Transport, Environment, and Women's Affairs
- Mr M. Watson
3. Coordinating Group on the Conservation of Biological Diversity- Ministry of Transport, Environment & Women's Affairs.
- Mr M. Watson
4. National Wetland Steering Committee (representing DG) - Central Environmental Authority.
- Mr M. Watson
5. National Wetlands Committee Working Group to formulate the Wetlands Conservation Policy.
- Ms Anusha Amarasinghe
6. Forestry Research Committee- Forest Dept.
- Mr M. Watson
7. National Task Force on Forestry and Forest Legislation - Working Group 1 : Forest Management
- Mr M. Watson
8. Speech on Exchange of Information through networking with special reference to SLSTIC/NARESA organized by the National Library of Sri Lanka
- Ms Deepali Talagala

Participation of Steering Committee Members at Meetings

1. Prof. A.J. Gunewardene represented NARESA, which is the focal point for AASSREC in Sri Lanka at the AASSREC executive council meeting in Yogyakarta, Indonesia 25 - 27 March 1996.
2. Dr P. Ganashan participated in the 4th International Technical Conference on Plant Genetic Resources held in Leipzig , Germany from 17-23 June 1996. He was nominated by the NARESA Steering Committee on Biotechnology.

Visits of Foreign Delegates:

Dr Leonard Pinto, Senior Consultant, Australian Water Technologies (AWT) , Australia, visited NARESA and had discussions with the senior staff on matters of mutual interest and possible collaboration.

Prof. Jan Nilsson of SIDA and Dr Nimal Sandaratne of the National Development Bank (NDB) visited NARESA in July 96 to evaluate the SIDA projects. Prof. Nilsson met with the members of the Board of Management and the Project leaders of SIDA/SAREC projects. Prof. Folke Peterson visited Sri Lanka and had discussions with the leaders of the SIDA "Renewable Energy & Energy Efficiency" project.

Dr Berita Olsson and Dr Afzal Sher of SIDA visited Sri Lanka in September 1996 to discuss the future funding for research based on the recommendations of the evaluation team visited in July '96. The delegates had discussions with NARESA, project leaders and Government officials and the Ministry of S,T & HRD. The discussions were cordial and NARESA's expectations of funding for the International Contact Fund and the project on information appeared acceptable. There was also a possibility of a special research fund to complement NARESA's research fund. Decisions on Urgent Spare Parts for equipment would henceforth be made locally by NARESA.

Urgent Spare Parts Fund

Thirteen requests from various organizations for urgent spare parts were forwarded to SAREC. The total request exceeded US\$ 13,700.

Research Co-ordination Activities

1. National Zoological Gardens - Related Research Projects

As a result of discussions the Consultant to the National Zoological Gardens had with NARESA, action was taken under the Zoological Survey of Sri Lanka (ZSSL) for zoo-related research projects to be carried out under NARESA/ZSSL funds provided by the National Zoological Gardens.

2. Unauthorized Collection and Export of Fauna and Flora

In accordance with the recommendations made by a special Committee appointed by NARESA, which have been submitted to Her Excellency the President through the Hon. Minister for Science, Technology & Human Resources Development, preliminary discussions were held by the NARESA Steering Committee on Biological Sciences with respect to the preparation of manuals for the use of customs officials.

3. Research Collaboration with Cuba

A discussion was held at the Ministry of Science, Technology & Human Resources Development on 15 May 1996 at which various aspects on the application of Biotechnology in Agriculture, Health, Animal Husbandry and Veterinary Sciences and Industry were discussed with Prof. E. Pontanario from the University of Havana, Cuba. Proposals were called for research co-operation in the following areas:

- (i) Production of vaccines for Hepatitis B and C
- (ii) Production of interferons

- (iii) Enzyme technology - Production of Streptokinase
- (iv) Production of cheap diagnostic kits for HIV

4. Indo- Sri Lanka Joint Sub Commission on Science and Technology

Indo-Lanka Joint Sub-Commission on S & T in April, 1994, identified biotechnology as the priority area of collaboration between the two countries. It was agreed that Sri Lanka would submit preproposals and identify names of the investigators and institutions and the Indian side would organize a joint-workshop to firm up specific proposals, involving counterpart Indian investigators and institutions.

Reiterating the importance of continued co-operation in the field of Science and Technology the second meeting of the S & T Sub Commission took place in Colombo at Taj Samudra Hotel on September 6-7, 1996. At this meeting the principal investigators from Sri Lanka successfully presented their project proposals.

Other Activities during the year

1. Commonwealth Science Council (CSC)

Sri Lanka is in the Executive Council of the CSC and the Director General Prof. Priyani E. Soysa, attended the Executive Council meeting in London in April 1996. Besides general items of the Executive Council the local project proposal on the Engineering Design Centre was also discussed. The establishment of a Regional Centre for Pesticide residue analysis was recommended.

2. International Centre for Genetic Engineering and Biotechnology (ICGEB)

- (a) NARESA being the National Focal Point for ICGEB co-ordinates all the activities of ICGEB in Sri Lanka through the Steering Committee on Biotechnology. Information on pre-doctoral and post-doctoral fellowships, practical and training courses were received. One post-doctoral fellowship was awarded to Sri Lanka in 1996. Project proposals were also called for collaborative research at Affiliated Centres of ICGEB. A collaborative research project was accepted for funding.

Project title: Vaccination potential of merozoite surface proteins of *Plasmodium falciparum*.

- (b) Prof. R. Ramasamy being the representative for Sri Lanka, participated at the ICGEB Board of Governors Meeting in Trieste, Italy from 02-04 December.

3. Regional Seminar on Forests of the Humid Tropics of South & South East Asia

The Regional Seminar on the forests of the humid tropics was held to commemorate forty years of UNESCO contributions to the study of vegetation in the humid tropics.

This was held in Kandy from 19-22 March and was organized by NARESA under the aegis of the Man and Biosphere (MAB) National Committee and UNESCO.

The technical sessions were on:

- * Forest Biodiversity in Humid Tropics
- * Ecological Characteristics and Environmental Functions of Humid Forests
- * Conservation of Tropical Humid Forests
- * Sustainable Utilization of Tropical Humid Forest Resources
- * Link between Sustainable Development of Forest Resources and Conservation of Biodiversity.
- * International Co-operation on Issues Relevant to Conservation and Development of Forests in Asian Humid Tropics.

Twenty eight papers were presented by foreign and local scientists.

Sixty local and foreign scientists participated in the seminar. Preparations are being made to publish the proceedings of the seminar.

4. **Regional Workshop on "Research for the Management of Coastal Resources in the Tropics"**

The Regional Workshop was organized by NARESA's Advisory Committee on Coastal Ecology in collaboration with National Aquatic Resources Development and Research Agency (NARA) with the following objectives in view.

- * Review and discuss research aimed at the development of management systems for coastal resources including environmental issues.
- * Share experience in application of research methods and results available in the region.
- * Identify areas for future research needs and technology transfer.

It was sponsored by Swedish International Development Co-operation Agency (SIDA). The Workshop was followed by two day field visits to coastal habitats situated along the southern coastal belt of Sri Lanka, eg: Hikkaduwa, Rekawa, Hambantota and to inland fishery research station at Udawalawa, with an aim to give participants on site experience.

The scientists who have been engaged in research at NARA, Universities of Colombo, Ruhuna, Kelaniya, Sri Jayewardenepura and Peradeniya in the areas of coastal resources, coral reef management, mangroves, sea grass beds, fishery resources, oceanography, biodiversity, socio-economic aspects presented papers at the workshop. The scientific programme consisted of twenty five paper presentations with four key-note speakers from experts and a poster presentation on the identified eight research topics for six sessions.

The scientists from countries like India, Thailand, Indonesia and Sweden delivered speeches based on the research work carried out in their countries on coastal resource management, mangroves etc.

Recommendations of the workshop for research were to attain the goal of sustainable management for coastal areas, ecosystems and resources.

5. **International Seminar on Problems of Monitoring Pesticide Residues in Exportable Commodities**

The increased use of pesticide chemicals on food crops in Asia, including Sri Lanka has resulted in growing concern regarding the possibility of either a high level of residues or the findings of non-permitted residues of these chemicals in food and other agro-based products. There have been repeated occasions where export shipments of food and other products have been refused entry into the importing country because of the presence of excessive pesticide residues or the findings of residues of non-permitted pesticides.

The Commonwealth Science Council (CSC) under its Chemical Research and Environmental Needs (CREN) Programme organized an International Seminar in Colombo to address this problem of pesticide residues in exportable commodities. The local organisers were NARESA and CISIR, assisted by other agencies. The seminar cum workshop was held from 4-9 April 1996 with the following objectives:

- * To review the current status of the pesticide residue monitoring programmes in the region and to formulate strategies to strengthen the participating countries in such activities.
- * To expose the participants to capabilities of the state of the art methods in pesticide residue analysis in food, water and environment in general and in exportable commodities viz rice, tea, fish and minor crops in particular.
- * To compile a database on maximum residue limits for various commodities as applicable to all member countries .
- * To set up a network of focal points in participating countries to facilitate exchange of information in pesticide use and to deal with related issues.

This seminar was inaugurated by Hon. Bernard Soysa, Minister of Science, Technology and Human Resources Development. Hon. Kingsley Wickramaratne, Minister of Internal and External Trade Commerce and Food, and Hon. Indika Gunawardena, Minister of Fisheries and Aquatic Resources Development were Guests of Honour.

The seminar was attended by both local and foreign participants including experts from abroad. The countries represented were UK, Malaysia, Papua New Guinea, New Zealand, Pakistan, Sri Lanka, Indonesia and India. There were thirty one Sri Lankan participants from universities, govt. institutions and the private sector. This seminar cum workshop was useful to upgrade our facilities and expertise in this important area.

6. **Swedish Agency for Research Cooperation in Developing Countries (SAREC)**

SAREC/NARESA Water Buffalo Programme

The research programme was concluded and final reports are expected. The activities of the buffalo information dissemination programme was expanded. A Project Co-ordinating Committee (PCC) has been formed to advise and co-ordinate the activities of the programme. The PCC consisted of representatives from the government organisations involved in livestock development.

A mixer for Urea Molasses Mineral Blocks (UMMB) has been fabricated by the National Engineering Research and Development (NERD) Centre and it will be installed at Narangalle Farm for the production of UMMB for farmers in the area.

The extension programme was carried out with fifteen demonstration farmers in the Pannala, Kuliypitiya and Bingiriya veterinary ranges to introduce the benefits of the management package developed by the researchers. Farmers in the Mahaweli System H - Thambuttegama, System C Girandurukotte and North Western Province have been trained on the improvement of the productivity of farming and integrating a better buffalo farming system within their farming systems.

SAREC/NARESA Bilateral Research Cooperation

Rs. 20.9 million was received from Sweden under SAREC/NARESA bilateral research co-operation to enhance the research capability in Sri Lanka. Six projects are funded under this programme for 1996. (vide annex)

7. **Association for Science Communication**

An association for Science communication consisting of journalists from newspapers was formed. A constitution was drafted. The Steering Committee on Science Education will support the activities of this association.

8. **Workshop on Popular Science Writing**

A workshop on Popular Science Writing was held at NARESA on 11 May 1996. It was inaugurated by Hon. Bernard Soysa, Minister of Science, Technology & Human Resources Development and Hon. Dharmasiri Senanayake, Minister of Mass Media, Aviation and Tourism was the chief guest at the closing session on 11 May 1996. Twenty five young journalists from various newspapers were present. The main objective of the workshop was to train a group of young journalists in the methodologies of popular science writing and to commit and motivate them to take on this task through the print media available in the country.

There were eight presentations on the style, content and language of a science article by experienced personnel like editors of newspapers, university academics and journalists.

Revision of Publication on the Flora of Sri Lanka

Work on the revision of the flora was continued. Printing of Vols.10 and 11 was completed, and Vol 12 was handed over to the printer. Volumes 13 and 14 (Index) which will complete the flowering plants, are under preparation.

Visitors:

Dr D. Philcox, a botanist from Kew Gardens, spent seven weeks at the National Herbarium. Ms. Kate Edmondson, a paper conservator from Kew, visited the National Herbarium, the herbarium at Hakgala, and several other libraries and advised on the preservation of herbarium specimens and books during a ten day visit.

Commemoration of the Centenary Death Anniversary of Dr Henry Trimen: On a suggestion by NARESA advisory committee, the Agriculture Department arranged the following commemoration activities in October : tree planting at the Botanic Gardens, Peradeniya, memorial service at St. Paul's Church Kandy, laying of wreath at the cemetery, and a technical session at the Gardens.

The British ODA/GOSL project, under which the revision of the Flora of Ceylon was carried out, ended in December 1996. The ODA has made arrangements to continue the project work to its conclusion, with the finalising of Vol. 14 and a volume on the ferns, in March 1997. The setting up of a permanent Botanical Survey Unit in the National Herbarium of the Botanic Gardens was recommended by the Advisory Committee.

Science and Technological Indicators Unit

The S&T Indicators Unit which was set up to support all aspects of scientific studies required for policy aspects continued work with ,

- (i) the collection of information for the revision of the database on ongoing research for 1995/1996. Data on over 400 projects were added.
- (ii) World Wide Web pages on R&D Institutions were prepared based on the survey on science and technology institutes in Sri Lanka. This information is available on the Internet through the NARESA Home Page.
- (iii) a draft report on R&D expenditure in Sri Lanka was prepared. This can be taken as the base for a comprehensive survey.

Sri Lanka Scientific and Technical Information Centre (SLSTIC)

Activities of SLSTIC were based on the areas mentioned below:

1. The National Information Network project

Implementation of the project was to develop the National Information Network for exchange of Scientific and Technical Information with SLSTIC/NARESA as the focal point. This was funded by SAREC. The project development and set-up are described below:

NARESA Local Area Network (LAN)

Initially ten workstations with five multimedia PC's, a network server and main networking equipment were purchased and network wiring and installations commenced in February 1996.

Local Area Network running on Novell 4.1 was fully implemented by April 1996 and was introduced to the NARESA staff. All the members of the executive staff and the documentalists at the library were assigned access facilities to the Network with exclusive work space on the network. Initial training on the Network and access to the Network was immediately available to the scientific staff for their office work. The electronic-mail (e-mail) facility which was limited to a single PC was available to all the users providing a better tool to communicate with local and international scientific communities.

The local databases were installed on the Network and the library staff commenced work on data entry by May 1996.

The CD-ROM databases were commissioned in May 1996 providing the local scientific community with a rich information source at NARESA.

In November 1996 five more workstations were added to NARESA resources thus providing all the scientific officers with one networked PC in each room.

A heavy duty printer and a PostScript laser printer were installed on the network for the users to take hardcopies of the information, if required. This service was available from May 1996.

Newly configured scanner at NARESA provides an opportunity to publish graphical information on the Network and an Optical Character Recognition software provides a means of converting scanned text documents into editable text files.

Internet on-line

In August 1996, the NARESA Local Area Network was connected to **LEARN** (Lanka Educational Academic and Research Network) hub at the Sri Lanka Telecom (SLT). Two routers, one at NARESA and the other at SLT, were provided and configured by NARESA. These routers are connected through a 64kbps leased data circuit providing on line connectivity to the Internet. **The Internet connectivity was officially inaugurated by the Hon. Minister of Science and Technology and Human Resources Development on Tuesday, 3rd September 1996.** Distinguished scientists and librarians were present at this occasion. The SIDA representative and Director, British Council were among those present.

The Information Centre staff had developed the NARESA Home Page and this was demonstrated to the audience. The homepage contained general information about NARESA, its activities and other S&T information. This was an initial step in publishing information on the World Wide Web and new information was continuously added onto the Internet by the Information Centre Staff. This included the Internet edition of the NARESA newsletter which was published quarterly, Information about other R & D institutions in Sri Lanka, S & T events, publications by NARESA, abstracts from the databases, papers presented by distinguished scientists etc. and LINKS to the international sites with S&T information. Publishing current information is done on a regular basis by the Information Centre. According to an Independent Counter an average of about 500 people from all over the world view our home pages monthly and this has been continuously increasing as we included more information. NARESA maintains its own home page at the NARESA WWW server (<http://www.naresa.ac.lk>).

By November 1996 a PC based UNIX server was configured as the main mail server and the Domain name server for NARESA, enabling NARESA to manage its Internet servers locally and providing the staff at NARESA with on-line e-mail instead of the off-line e-mail.

This UNIX server acts as a temporary FTP server and the only machine with a Telnet facility. Regular monitoring of the network for security and trouble shooting purposes is handled by this machine while the Information Centre staff daily attends to the human intervention required.

Network Access

Users were provided with a free facility of searching information through Internet and CD-ROM databases until the end of 1996. Two workstations were specially allocated for them at the library. There were also searches done by library staff for the e-mail requests from local scientists who could not come to NARESA premises. A special e-mail account was allocated for these remote requests.

There is a common account for the general users to search for available CD databases.

CD-ROM Services

Following CD databases were available at the Information Centre at the end of the year 1996.

- * SIRS Researcher (a reference tool that contains full-text articles on a wide variety of science, social science and world affairs topics.)
- * Dissertation Abstracts
- * Derwent Biotechnology Abstracts (Information derived from primary journals, conference proceedings and patents.)
- * Life Sciences Collection

* EI Energy and Environment

All these databases were quarterly updated from June 1996, providing the scientific community the latest information.

NARESA In-house Databases

NARESA manages the following local databases.

- UNILIST* - Union list of periodicals available in Sri Lankan libraries (this may be linked with the periodicals projects granted to the universities)
- SLSTEP* - Directory of S&T Personnel in Sri Lanka
- SLSI* - Sri Lanka Science Index (includes local literature)
- DBOSR* - Ongoing research in Sri Lanka (updated once in two years)
- SLSTIC* - SLSTIC library collection
- RGRA* - S&T research sponsored by NARESA

These databases were developed to provide information to the scientific community not only in Sri Lanka but also in other countries. Selected information from these databases was available on NARESA Home Page. Many requests about information regarding research grants and journal articles were received as a result.

The library staff and the scientific staff were involved in regular updating of the above databases during the course of the year 1996.

In addition to these databases arrangements have been made to survey present status on climatic information in Sri Lanka and to develop a database on databases (climatic information).

2. **Research Grants** - for research and for compilation of biographies of eminent Scientists (vide annex).

3. **Workshops & Seminars**

- **Demonstrations on Internet & CD Rom Searching**

- * SLAAS Annual Sessions at University of Kelaniya 25th - 29th November
- * 2nd Annual Forestry Symposium at Tangerine Beach Hotel 6-7 December
- * Library Day Seminar at the British Council on 8th November
- * University of Moratuwa on 12th October

As part of the programme to increase awareness among the scientific community for retrieving information through Internet and CD-ROMs, NARESA maintained a stall at the SLAAS annual exhibition at the University of Kelaniya in November 1996. Hands on demonstration on Internet and CD-ROMs were given to the visitors. A science quiz on a computer and on-line data-entry into scientific-personnel database maintained by NARESA were the other attractions. There were similar demonstrations at the University of Peradeniya and the University of Sri Jayawardenapura.

4. CDS/ISIS software

SLSTIC/NARESA is the national distributor for CDS/ISIS software developed by Unesco. This is the software used in the majority of libraries in Sri Lanka. SLSTIC provides training on using this software as well as consultancy on trouble shooting.

A simplified manual on CDS/ISIS in Sinhala was published as a guide.

The software was distributed to 12 libraries.

5. Staff

The unit was strengthened with the appointment of a full time Consultant Engineer in February 1996 and the services of a Voluntary Services Overseas (VSO) volunteer were available in April. Later in the year 1996, the consultant who was on a contract basis was recruited to the NARESA permanent cadre as a Scientific Officer in order to provide continuous network services to the scientific community. The VSO, a specialist in IT applications in libraries, had his contract extended until September 1997.

6. Future Plans

NARESA wishes to consolidate its role as the focal point for science and technology information by expanding and promoting the information services it provides to the scientific community in the country using the latest technology. To achieve this it is necessary to augment the facilities already in place, specially in terms of more storage and increased number of workstations to facilitate better public access to NARESA resources.

- New Dial- in -Server which will be added to NARESA's hardware will allow remote R&D institutions to connect to NARESA Network to access information.

- There will be an addition of a powerful UNIX workstation to provide a better web server with multimedia capability and also to make some of the CD-ROMs available to the remote users.
- NARESA intends to get the CDS/ISIS UNIX version so that some of the local databases could be searched directly by the remote users.
- There will be new additions to the CD-ROM database collection to provide the users with more information on Science and Technology.

Layout of Computer Resources at NARESA

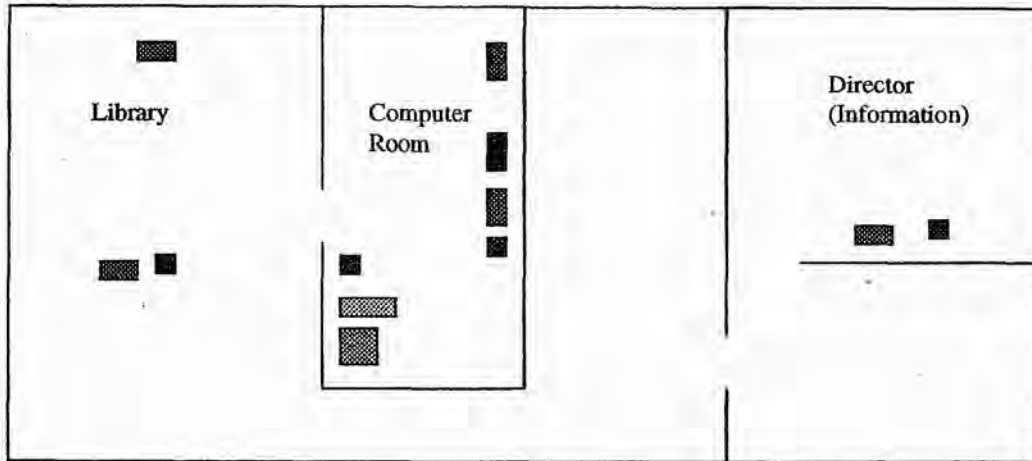
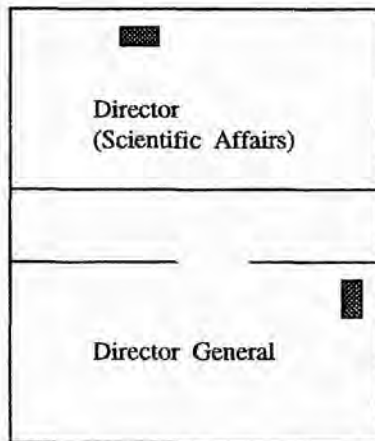


Figure 1 : Library and DP's office (Ground Floor)



Legend






-  Workstations
-  PC UNIX server
-  Novell Server
-  Printer
-  CD ROMs

Figure 2 : DG's Office

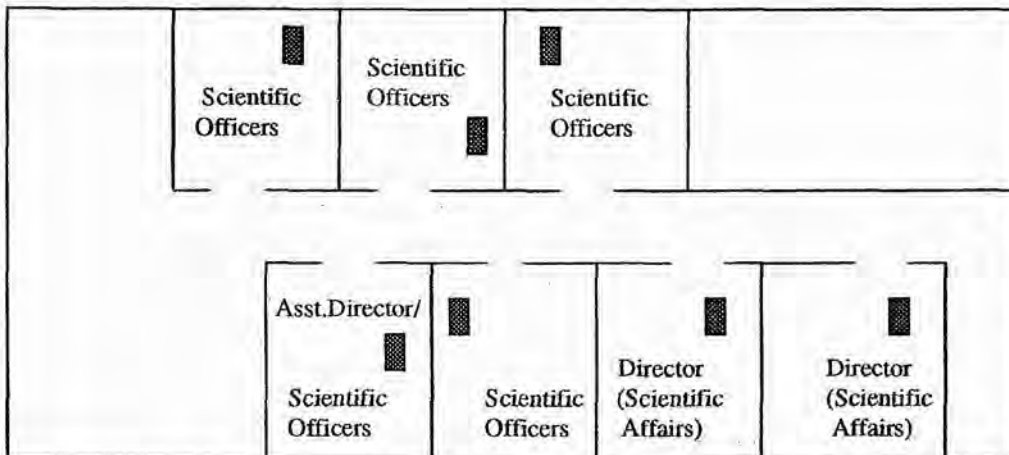


Figure 3: First Floor

Board of Management of NARESA

Prof. Priyani E. Soysa (Chairperson)
Director General
NARESA
47/5, Maitland Place
Colombo 07.

Dr A.S. Induruwa
Head
Dept. of Computer Science & Engineering
Univ. of Moratuwa
Moratuwa

Dr U. Pilapitiya
Head
Bandaranayake Memorial Aurvedic Research Institute
Nawinna
Maharagama

Dr R.O.B. Wijsekera
Chairman
Ceylon Institute of Scientific & Industrial Research (CISIR)
Colombo 07.

Dr T. Vitarana
Advisor
Ministry of Science, Technology &
Human Resources Development
Colombo 10

Prof. N. Kodagoda
Faculty of Medicine
University of Colombo
Colombo

Mr G. Gunatilleke
Executive Vice Chairman
Marga Institute
93/10 Dutugemunu Street
Colombo 06.

Mr D.G. Senadhipathy
Energy Consultant
Ministry of Science, Technology &
Human Resources Development
Colombo 10

Prof. C. Dahanayake
 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
 Pelawatta
 Battaramulla

PRINCIPAL STAFF OF NARESA

Director General

Prof. Priyani E. Soysa	MD (Cey), DSc (Ruhuna) FRCP (Edin. & Lond) FCCP, DCH (Eng)FRCPCH (London)
------------------------	---

Directors, Scientific Affairs

Mrs Swarna P. Prelis	BSc (Hons) (Cey), MSc (S.L.)
Mr M. Watson	BSc (Cey), MPhil (London)
Mr R.M.W. Amaradasa	BSc (S.L.), MSc (S.L.)

Director, Information

Mrs D.D.Deepali Talagala	BA (Cey) , ASLLA
--------------------------	------------------

Assistant Director, Scientific Affairs

Miss H.Anusha U. Amarasinghe	BSc (S.L.), MSc (S.L.)
------------------------------	------------------------

Scientific Officers

Mrs C.Geethika Yapa	BSc (Hons), (S.L.)
Mr B.M.C.K. Basnayake	BSc (S.L.)
Mr A.W.J. Karunasinghe	BSc (S.L.)
Mrs G.Nandanie Ulluwishewa	MSc (Hons) (U.S.S.R.) MSc (Japan)
Mrs Seetha I. Wickramasinghe	BSc (Hons) (S.L.), MSc (S.L.)
Mrs Rohini Wijeratne	BSc (Hons) (S.L.)
Miss Shamini P. Spencer	BSc (Hons) (S.L.), Msc (London)
Dr J.L. Ratnasekera	MSc (U.S.S.R.), PhD (U.S.S.R.)
Dr Thamara F. Dias	MSc (Hons) (U.S.S.R.), PhD (U.S.S.R.)
Dr D.B.M. Wickramaratne	PhD (S.L.) from 02/12/96
Dr R.S. Fernando	MSc (U.S.S.R.) PhD (U.S.S.R.) from 02/12/96
Mr N. P. Kumara	BSc (S.L.) from 02/12/96

Documentalists

Mrs Renuka P. Hathurusinghe	BSc (S.L.) (on no pay leave)
Miss V.Nanda Perera	BSc (S.L.) ASLLA
Mrs A.A.Amila Vijayanthi	BSc (S.L.)
Mrs Vasantha N. Dharmaratne	ASLLA
Mrs Jayanthi Weeratunga	ASLLA

Assistant Administrative Secretary

Mr S.P. Dissanayake	BSc (BAdm) (S.L.)
---------------------	-------------------

Accountants

Miss K. Chathurangani J.T.K. Fernando	(Chief Accountant)	ACMA
Mr M.H.M.S. Hamid		
Mr A.C.M.Daniel		

Graduate Translator

Mrs Subadra L. Tillekeratne	BA (Cey)
-----------------------------	----------

Confidential Secretaries

Mrs Swinee Ratnayake
Mrs Seetha P. Wijesinghe

Staff Assistant (Administration)

Mr S. Galketiya

Printing Superintendent

Mr K.P. Senanayake

Accounting Assistant

Mrs Yamuna J. Pathirana

The Director General is the Chief Executive of the institution and is the Chairperson of the Board of Management of the institution. The Board advises the Authority on all aspects of financial and administrative matters. The Board is appointed by the Hon. Minister of ST & HRD, and consists of a Chairman and ten members. The Board is informed on all aspects of the activities of the institution by the Director General.

The Scientific matters of the Authority are carried out by the scientific staff through the respective Steering Committees or Technical Committees. Administrative matters and office maintenance function under the Administrative Secretary. The Chief Accountant is directly accountable to the Director General and Internal Audit is accountable to the Board.

Scientific and Technical Committees

Steering Committee on Energy

Prof. K.K.Y.W. Perera (Chairman)
Mr G.B.A. Fernando
Mr M.P.A.U.S. Fernando
Mr K.S. Fernando
Dr A.N.S. Kulasinghe
Dr R. Wijewardene
Mr V. Mendis
Mr D. Chandrasekera

Steering Committee on Science Education & Editorial Board of Vidurava

Prof. N. Kodagoda (Chairman)
Prof. W.D. Ratnasooriya
Prof. P.L.D. Waidyasekera
Dr U.M. Senanayake
Dr R. Mahindapala
Mr A. Siriwardena
Mr T. Malalasekera
Mr T. Sabaratnam
Mr J.P. Herath

Steering Committee on Agriculture & Animal Husbandry

Dr R. Mahindapala (Chairman)
Dr A.S. Abeyratne
Prof. H.P.M. Gunasena
Prof. K.K. Pathirana
Dr N.F.C. Ranaweera
Prof. Y.D.A. Senanayake
Dr T. Wettasinghe

Editorial Board of the Journal of the National Science Council

Prof. R. Ramasamy (Chairman)
Prof. B.A. Abeywickrama
Prof. W. Breckenridge
Prof. C.B. Dissanayake
Prof. E.R. Jansz
Prof. V.K. Samaranyake
Prof. Priyani E. Soysa
Prof. Y.D.A. Senanayake
Dr C.G. Uragoda
Dr M.C.L.de Alwis
Prof. C. Dahanayake

Steering Committee on Medical & Veterinary Sciences

Prof. C.de F.W. Goonaratna (Chairman)
Dr Maya Atapattu
Dr M.C.L.de Alwis
Prof. Anoja Fernando
Prof. Dulitha Fernando
Prof. A.H. Sheriffdeen
Dr S. Mahalingam
Prof. E.H. Karunanayake
Prof. A.N.I. Ekanayake
Prof. J.S. Edirisinghe

Steering Committee on Social Sciences

Prof. Swarna Jayaweera (Chairperson)
Mr G. Gunatilleke
Dr N. Sanderatne
Prof. T. Silva
Prof. Kusuma Gunawardene
Prof. A.J. Gunawardene
Dr S.P.F. Senaratne
Dr Amala de Silva
Prof. K.W. Goonawardena
Dr S. Perera
Prof. S.T. Hettige

Steering Committee on Biotechnology

Prof. R. Ramasamy (Chairman)
Dr Nalini Withana
Dr P. Ganashan
Prof. U. Samarajeewa
Prof. S. Widanapathirana
Dr Jenifer Perera
Prof. J.M.R.S. Bandara
Prof. Lalitha Mendis
Dr J. Ranatunga
Dr Y.M.H.B. Yapabandara
Dr G. Jayawardena
Dr J. Fernando

Steering Committee on Natural Resources

Prof. B.A. Abeywickrama (Chairman)
Dr K.D. Arulpragasam
Mr K.P. Sri Bharathie
Prof. C.M. Madduma Bandara
Dr S. Somasiri
Mr H.M. Bandaratileke
Mr R.A.D.B. Samaranayake
Prof. M.A. Pemadasa

MAB National Committee

Prof. R.N.de Fonseka (Chairman)
Prof. B.A. Abeywickrama
Prof. Savithri Gunatileke
Prof. Kanthi Abeynayake
Prof. B.K. Basnayake
Dr R.H. Wickramasinghe
Dr R. Fernando
Dr Nirmalee Pallewatte
Dr J.M.P.K. Jayasinghe
Dr S.W. Kotagama
Mr H.M. Bandaratileke
Mr R. Algama
Mr K.A.J. Abeygunawardene

Steering Committee on Physical, Engineering, Mathematical Sciences & Built Environment

Prof. S. Karunaratne (Chairman)
Dr A.W. Mohottala
Dr S.A.K. Abeywardena
Prof. M.A.K.L. Dissanayake
Dr N.P. Wijayananda
Prof. L. Balasuriya

Steering Committee on Chemical Sciences

Prof. M.U.S. Sultanbawa (Chairman)
Prof. J.N.O. Fernando
Prof. H.D. Gunawardhana
Prof. V. Kumar
Dr A.M. Mubarak
Prof. O.A. Ileperuma
Dr B. Perera
Dr D. Nugawela

Steering Committee on Biological Sciences

Prof. Uma Coomaraswamy (Chairperson)
Prof. W.D. Ratnasooriya
Prof. S.A. Kulasooriya
Prof. R.N. de Fonseka
Dr Manthri S. Ramasamy
Dr F.P. Amarasinghe
Dr U. Jayasekera

Steering Working Committee on S&T Information

Dr K.D.G. Wimalaratne (Chairman)
Dr A.S. Induruwa
Mrs Ishwari Corea
Miss Clodagh L.M. Nethsinghe
Mr N.T.S.A. Senadheera
Mr N.U. Yapa

Advisory Committee on Buffalo Research (upto 3 Spetember 1996)

Prof. Priyani E. Soysa
 Dr M.C.L. de Alwis
 Dr S.S.E. Ranawana
 Prof. B.M.A.O. Perera
 Dr H. Abeygunawardena
 Dr W.J. Wailgama
 Dr D.H.A. Subasinghe
 Dr T. Jayatillake

Advisory Committee on Coastal Ecology Research

Prof. Priyani E. Soysa
 Prof. R. Ramasamy
 Dr U. Jayasekera
 Dr Pauline dayaratne
 Dr Padmini de Alwis
 Dr Ruchira Cumararatunga
 Prof. J. Jinadasa
 Dr S.U.K. Ekaratne
 Mr A. Rajasuriya

Commonwealth Science Council (CSC) - Travel

Date/Duration	Programme	Inst. Participated
02 October 1995- 15 March 1996	TAGS Programme, University of Sussex, UK	NARESA
24 June - 13 July	International Graduate Librarianship and Information Science, University of Wales, Aberystwyth, UK	Marga Institute
06 -11 July	XI th International Conference on AIDS, B.C. Place, Stadium, Vancouver	Navy Hospital
08-10 July	Domestication, Production & Utilization of New Crops: Practical Approaches, Univ. of Southampton, UK	University of Ruhuna
15 - 17 July	PacRim 2 - 2nd International Meeting of Pacific Rim Ceramic Societies, Cairns, Australia	University of Peradeniya

04 - 09 August	Post harvest 96 - International Conference on Post harvest Science, Tupo, New Zealand.	CISIR
15- 20 September	20th IUPAC Symposium on the Chemistry of Natural Products Chicago, Illinois, USA.	IFS
11 - 17 November	Maximizing Sustainable Rice Yields Through Improved Soil and Environmental Management, Khon keen, Thailand	University of Ruhuna
17 - 22 November	XIV th International Congress for Tropical Medicine and Malaria, Nagasaki, Japan	Anti Malaria Campaign
05 - 06 December	Asia Rubber Markets 1996 IBC Asia Ltd, Singapore	Rubber Research Institute

Training Workshops Conducted by CSC

Date	Theme	Inst. Participated
12 - 18 March	Training Workshop on Waste Management	CISIR Colombo Municipal Council
13 - 19 May	Technology Transfer Workshop on the use of PADARSAT Synthetic Aperture Radar for Sustainable Management of Forestry, Agricultural & Marine Resources	Forest Department
02 - 08 June	Workshop on Earthquake Hazard Mitigation for Non Engineered Structures	NBRO Univ. of Sri Jayawardenepura
27 - 29 June	Planning Meeting of Water & Urbanisation Project	NGO
05 - 10 November	Training Workshop on Air Quality Modelling and Atmospheric Acidification	Univ. of Peradeniya, NBRO

International Contacts Fund

Sixty six travel grants were approved under the SAREC funded International Contacts Fund, both for local scientists travelling abroad as well as for visiting foreign scientists, to facilitate interaction among scientists.

Twenty five follow up public seminars were organized for forty of these scientists to share their experiences with others.

Date/Theme of the International event	Participant	Date/Theme of the Public Seminar
07-09 February Southeast Asian Regional Seminar on Medical Education 1996 - Pattaya Thailand	Prof. C. Fonseka Prof. Anoja Fernando Dr H. Jayewardene	17.05.96 - Modern Trends in Medical Education
19 - 20 April Invention Exhibition - Geneva	Dr L.M.K. Tillekeratne	28. 06.96 - Some Recent Developments in Research in Rubber
12 - 15 September International Conference on Soil Resources and Agriculture - Kuala Lumpur	Dr D.M.A.P. Dissanayake	- do -
14 - 18 January 18th Annual Pacific Telecommunication Conference - Hawaii, U.S.A.	Mr N. Kularatne	08.07.96 - Modern Telecommunication Systems and Information Highway
29 Oct. - 02 Nov. Ecoset International Conference on Ecological System Enhancement Technology for Aquatic Environments - Tokyo, Japan	Prof. H.H. Costa	17.07.96 - Some Experimental Studies on Brushpark Fishery
05 - 08 May 1996 Convention of the Australian Institution of Food Scientists and Technologists and Workshop of Asian and Pacific Food Analysis Network- Brisbane, Australia.	Prof. U. Samarajeewa	19.07.96 - Some Thoughts for the Food Industry in the 21st Century.

08 - 13 January The 2nd International Soybean Processing and Utilization Conference- Bangkok, Thailand	Dr Nandanie Ediriweera	31.07.96 - Recent Trends in Food Research and Development- Soyabean Processing
07 - 11 October 7th Asian Congress in Nutrition, Beijing China	Dr Jaanaki Gooneratne	31.07.96 - Nutritional Products
Third APFAN Conference on Food Analysis- Manila, Philippines	Mr J.A.G. Jayasinghe	31.07.96 - Food Analysis in the Asia Pacific Region
10 -12 December Second International Plant Tissue Culture Conference - Dhaka, Bangladesh	Dr (Mrs) Kshanika Hirimburegama	01.08.96 - Recent Developments in Tissue Culture Research in Asia
16 - 20 October Fourth Asian Fisheries Forum -Beijing , China	Miss Shirani Nathanael	07.08.96 - Experiences from International Conferences "The Fourth Asian Fisheries Forum"
14 - 17 May Second International Conference on Culture of Penaeid Prawns and Shrimps- Iloilo City, Phillippines	Miss A.Shyamala L.E. Corea	07.08.96 - The Second International Conference on Culture of Penaeid Prawns and Shrimps
29 June - 05 July 13 th World Congress - International Federation of Automatic Control San - Francisco U.S.A.	Dr N. Nanayakkara	08.08.96 - Control of Wind Turbines to Minimize Adverse Effects on the Power System
21 - 25 May Tenth Congress of South Asian Libraries CONSAL - Malaysia	Mrs Geetha Yapa	15.08.96 - Libraries in National Development
14 - 19 July 14th International Conference on Chemical Education - Brisbane, Australia	Prof. J.N.O. Fernando	29.08.96 - Chemistry : Expanding the Boundaries

12 - 15 March The Third International Scientific Meeting of the Royal College of Obstetricians & Gynecologists New Delhi, India.	Dr J. Sirisena	11.09.96 - Education and Induced Abortion
15 - 20 October 15th Asian & Oceanic Congress of Obstetrics and Gynecology- Bali, Indonesia	Dr P.C. Gunasekera	11.09.96 - Cervical Screening for Sri Lankan- Women
09 - 15 June Symposium on Accelerative Forest Regeneration on Degraded Tropical Lands- Washington D.C., USA	Prof. I.A.U.N. Gunatilleke	12.09. 96 - Accelerating Native Forest Regeneration on Degraded Lands
15 - 17 Pac Rim 2nd International of Pacific Rim Ceramic Societies - Cairns, Australia	Prof . B.S.B. Karunaratne	13.09.96 - Physics of Technologically Important Materials
03 - 08 December 10th International Conference on Solid State Ionics - Singapore	Mr G.D.L.K. Jayasinghe	- do -
03 - 08 December 10th International Conference on Solid State Ionic - Singapore	Mr H.H. Sumathipala	- do -
01 - 05 July 18th International Biomass Conference Free University - Amsterdam, Netherlands.	Dr W.N. Wickremasinghe	25. 09. 96 - Some Contributions to the Analysis of 3 way Non-Replicated Experiments
26 - 30 August 14th Meeting of the International Association of Forensic Science - Tokyo	Mr D.M.U.J. Abeyasinghe & Ms. Seetha Liyanage	10.10.96 - Cannabis and Ayurvedic Drugs - the Need to Amend Legislation and Application of Entomology in Forensic Sciences

09 - 03 September 21st and 22nd Water, Engineering and Development Centre Conferences - India	Mr J.M.J.C. Jayalath & Mr M.A.M.S.L. Attanayake	14.10.96 - Use of Gravity Flow Roughing Filter for Pretreatment & Use of Laterite in Water Treatment
26 - 30 August International Conference on KHMER Studies - Phnom Penh, Cambodia	Prof. H.B.M. Ilangasinghe	16.10.96 - Some Aspects of the Relations Between Sri Lanka and Kampuchea
02 - 06 September VII European Multicolloquium on Parasitology - Parma, Italy	Prof. A.S. Dissanayake	21.10.96 - Human Dirofilariasis in the Old World
02 - 04 October - Australian Universities Power Engineering Conference "96" - Melbourne, Australia	Dr A.S. Karunananda	30.10.96 - Power Systems: Applications in South Asia
01 - 03 October - International Meeting on Resource Inventory Techniques to Support Agroforestry and Environmental Activity - Chandigarh, India	Dr M. de Zoysa	29.11.96 - The Current Trends in Agro-forestry Research
02 - 06 April -Fifth International Micro Irrigation Congress - Orlando, Florida USA	Dr A. Anandacoomaraswamy	07.12.96 - Micro Irrigation - Effects on Growth and Water Use of Tea
04-10 November Managing Soil Fertility for Intensive Vegetable Production System in Asia - Shanhua, Taiwan	Dr J.D.H. Wijewardena	07.12.96 - Improvement of Vegetable Production in Asia and Nutrition Management
07 - 09 April Second International Seminar on Water and Environment - Kathmandu, Nepal	Dr N. Priyantha	07.12.96 - Electrochemical Detection of Pesticides in Water

- | | | |
|---|--|---|
| 03 - 05 July
Asian International
Mycological Congress 1996 -
Chiba City, Japan | Dr A.H.R. Jayaratne | 07.12.96 - Mycological
Research in Asian Countries, |
| 07 - 09 April
The Society for Experimental
Biology, Annual Meeting -
Lancaster, U.K. | Dr (Miss) C.
Sanathanie Ranasinghe | 07.12.96 - The Impact of
Elevated CO ₂ on Leaf Cellular
Mechanism |
| 15-19 January
Regional Workshop on
Climate Change- Manila,
Philippines | Dr M.A. Wijeratne | 07.12.96 - The Impact of
Global Climate Change on Asia
and the Pacific Region |
| 15-16 November
First Asian -Australasian fish
Genetics Workshop - Kuala
Lumpur, Malaysia | Dr (Mrs) N. Jeevanthi
de S. Amarasinghe | 11.12.96 - Review of Fish
Genetic Resources in the Asian
- Australasian Region |

New Grants awarded in 1996

Discipline - Biotechnology

Grant No.	Grantee/Institute	Title / Duration	Total Allocation Rs.
RG/96/BT/01	Dr G.A.U. Jayasekera Dr T.D. Silva Dept. of Botany Univ. of Colombo	Development of techniques for genetic transformation of <i>Mangifera indica</i> , using <i>Agrobacterium tumefaciens</i> . 02 years	410900
RG/96/BT/02	Dr R.L.C. Wijesundera Mr N.V. Chandrasekaran Univ. of Colombo	To develop DNA probes to detect the presence of fungal pathogens in propagation material and plant tissue 02 years	380000
RG/96/BT/03	Dr N. Iddagoda Dr (Mrs) Senanayake IFS	In vitro regeneration and mass propagation of two endangered Sri Lanka forest tree species (<i>Diospyros quaesita</i> and <i>Diospyros atrata</i>) 03 years	302700
RG/96/BT/04	Dr (Miss) A. Arasaratnam Prof. K. Balasubramaniam Univ. of Jaffna	Large scale production of alpha amylase from <i>Aspergillus oryzae</i> 02 years	310000
RG/96/BT/06	Dr (Mrs) S. Dharmasiri Prof. N.K.B. Adikaram Dept. of Botany, Univ. of Peradeniya	Development of molecular diagnostic tests for quiescent <i>Colletotrichum</i> infections in fruits and vegetables 02 years	746000
RG/96/BT/07	Mr Gunarathne de Silva BMARI	Use of biotechnology for conservation and sustainable use of medicinal plants in Sri Lanka	653000
RG/96/BT/08	Dr S.S. Ranaweera Dept. of Botany Univ. of Sri Jayawardenapura	Production of phytochemicals of antitumor, antileukemic and antiviral activities by cell cultures of <i>Ophiorrhiza mungos</i> L. 01 year	197500

(1)

New Grants awarded in 1996

Discipline - Biological Sciences

Grant No.	Grantee/Institute	Title/Duration	Total Allocation Rs.
RG/96/B/01	Prof. F.P. Amarasinghe Dept. of Zoology Univ. of Peradeniya	A study on the taxonomy and ecology of cattle ticks (<i>Acarina : Ixodidae</i>) in Sri Lanka 03 years	536580
RG/96/B/02	Prof. (Ms) K. Abeynayake Dr(Ms) G.I. Seneviratne Dept. of Botany Univ. of Colombo	Diversity and phytosociology of aquatic macrophytes in the upper tributaries of Kelani, Walawe, Kalu and Mahaweli rivers of Sri Lanka 03 years	248000
RG/96/B/03	Mr T. A. Abhyawardana Anti-Malaria Campaign Narahenpita Colombo 05.	Study of the bionomics of the sibling species of <i>Anopheles subpictus</i> 02 years	239000
RG/96/B/04	Dr S.W. Kotagama Dr U.K.G.K. Padmalal Ms I.K Rajapakse Div. of Zoology Open University Nawala, Nugegoda	Ecology of sambar deer (<i>Cervus unicolor unicolor</i>) in relation to habitat requirements and predator (<i>Panthera pardus pusca</i>) pressure at the Horton Plains national Park. 02 years	415000

New Grants awarded in 1996

Discipline - Natural Resources

Grant No.	Grantee/Institute	Title & Duration	Total Allocation Rs.
RG/96/NR/01	Dr M.S. Rupasinghe Sabaragamuwa University	Development of new methods for gem exploration-application of the Rb/Sr techniques 3 years	474000
RG/96/NR/02	Dr K. V. W. Kehelpannala IFS	Determination of the composition of graphite-bearing fluids in the earth's crust and origin of vein graphite in Sri Lanka. 3 years	433750

Discipline - Energy

Grant No.	Grantee/Institute	Title & Duration	Total Allocation Rs.
RG/96/EP/01	Mr T.B. Adhikarinayake Mr V. Mendis Dr M.D.S. Weeraratna NERD Industrial Estate Ekala, Ja-Ele	Survey on utilization of charcoal for domestic cooking in Sri Lanka and a literature survey of charcoal production and stores available in other countries	40000

(III)

New Grants awarded in 1996

Discipline - Information Sciences

Grant No.	Grantee/Institute	Title / Duration	Total Allocation Rs.
RG/96/IS/01	Mr D.S.T. Warnasuriya CISIR, Colombo 07.	Preparation of a comprehensive database on selected industrially important medicinal aromatic plants of Sri Lanka	207750
RG/96/IS/02	Mrs S. Illeperuma Fac. of Science, Univ. of Peradeniya, Peradeniya	02 years Information needs and information gathering behavior of researchers in the humanities culture and social sciences in the universities of Sri Lanka	85000
RG/96/IS/03	Prof. M.W. Thenabedu Faculty of Agriculture University of Peradeniya	01 year A Biography - Mr. A. W. D. Joachim	63000

(IV)

Grant No.	Grantee/Institute	Title / Duration	Total Allocation Rs.
RG/96/C/01	Dr K.A.N.S. Ariyaratne Dept. of Chemistry Univ. of Peradeniya	Isolation of rare earths from monazite using plumbagin 02 years	226000
RG/96/C/02	Dr (Ms) A. Navaratne Dept. of Chemistry Univ. of Kelaniya	Plant tissue based electrodes for detection of herbicides 03 years	352000
RG/96/C/03	Prof. H.M.N. Bandara Dr J.S.H.Q. Perera Dr R.M.G. Rajapakse Prof. D.T.B. Tennakoon Dept. of Chemistry Univ. of Peradeniya	Development of sensors for the monitoring of pollutants of the atmosphere and the hydrosphere 3 years	932000
RG/96/C/04	Dr N.L.V.V. Karunaratne Dept. of Chemistry Dr N.K.B. Adikaram Dept. of Botany Univ. of Peradeniya	Bioactive natural products from Sri Lankan lichens: Culturing of the mycobiont in the laboratory 03 years	930000
RG/96/C/05	Dr M.K.B. Weerasooriya Dept. of Chemistry Univ. of Kelaniya	Isolation purification and characterization of invertase from novel natural sources 2 years	346720

(V)

New Grants awarded in 1996

Discipline - Social Sciences

Grant No.	Grantee/Institute	Title & Duration	Total Allocation Rs.
RG/96/SS/01	Mr W.M.K.B. Wickremasinghe No. 1/76, Botota, Medawala	Caste as a factor affecting poverty in a selected area in Sri Lanka 1 year	48500
RG/96/SS/03	Mr M. Rathnayake Dept. of Geography University of Ruhuna	Impact of drought on rainfed crops in the Hambantota district. 1 year	95000

Discipline - Agricultural Sciences

Grant No.	Grantee/Institute	Title / Duration	Total Allocation Rs.
RG/96/AG/01	Dr R. Pathirana Dr R.N. Pathirana Univ. of Ruhuna	Induced mutations for the improvement of yield adaptability and quality of aromatic rice 03 years	694000
RG/96/AG/02	Dr D.C.K. Illeperuma Dr B.C.N. Peiris Univ. of Peradeniya Dr D.B.T. Wijeratne, HORDI, Peradeniya	modified atmospheric storage and its effect on biochemical changes of banana, avocado, pineapple and mango 02 years	446000
RG/96/AG/03	Prof. C. Bogahawatte Unvi. of Peradeniya	Socio-economic valuation and conservation of tropical forests: Case of wetzone natural forests in Sri Lanka 01 year	227000

New Grants Awarded in 1996

Discipline - Medical & Veterinary Sciences

Grant No.	Name/Address	Title/Duration	Total Allocation Rs.
RG/96/M/1	Dr. R Sivakanesan Dept. of Biochemistry Dr. V.U.L Illangsekera Dept. of Medicine Univ. of Peradeniya	The relationship between microalbuminuria, dyslipidaemia, blood glucose and fructosamine and the antioxidant status in Sri Lankan diabetics 01 year	336000
RG/96/M/2	Dr R S B Wickremasinghe Medical Research Inst. Colombo 08	Bacterial aetiological agents of skin sepsis in children with special reference to Group A streptococci in Sri Lanka 8 months	121420
RG/96/M/3	Dr. T S R Peiris Epidemiological Unit Ministry of Health	A study of factors influencing attempted suicides in an identified population and cost incurred by Dept. of Health services to treat them in hospitals 1 year	92500
RG/96/M/4	Prof. M S Chandrasekera Dr. C D Nanayakkara Faculty of Medicine University of Peradeniya	Establishment of norms for the time of eruption of the permanent dentition in Sri Lankan children of low and high socio-economic status 1 year	189025
RG/96/M/5	Prof. L G Chandrasena Dept. of Biochemistry Faculty of Medicine Univ. of Kelaniya	Changes in antioxidant levels in coronary artery bypass surgery. 1 year	111500

(VII)

RG/96/M/6	Dr (Ms) HR Rawoof Health Curative Dept. Colombo	A cross sectional community based study on the prevalence of Glaucoma 2 years	871780
RG/96/M/7	Dr S H Siribaddana Dr. D J S Fernando Dept. of Medicine Univ. of Colombo Colombo 08.	Clinical epidemiology of obesity in Sri Lankan urban and rural population 1 year	180080
RG/96/M/8	Dr. P Angunawala Dr. C J Wijayaweera Dept. of Pathology Univ. of Colombo Colombo 08.	Structural analysis of the edge of the cleft lip and palate in individuals with cleft lip and palate 2 years	153200
RG/96/M/9	Dr. (Ms.) C H Gauthamadasa Anti-filariasis Campaign Colombo South General Hospital Kalubowila, Dehiwala Dr. (Ms) Sriyani Ekanayake Dr. (Ms.) Rumala P Morel Dept. of Parasitology Univ. of Sri Jayawardanapura	Efficacy of bi-annual single dose of diethylcarbamazine (DEC) compared with standard 14 days course of DEC in the elimination of bancroftial filariasis in Sri Lanka 03 years and 06 months	600000
RG/96/M/1	Dr. M G Jeyaruban VRL, Gannoruwa Peradeniya	Identification of Physiological marker/markers in meat goats for genetic evaluation in Sri Lanka 08 months	128250

(VIII)

RG/96/M/10	Prof. M T M Jiffy Fac. of Medical Sciences Univ. of Sri Jayewardenapura Dr. Devaka Fernando Faculty of Medicine Univer. of Colombo Dr. P Hettiarachchi Fac. of Medical Sciences Univ. of Sri Jayewardenapura	A study of the glycaemic index of different varieties of rice in Sri Lanka 2 years	230600
RG/96/M/11	Dr. Deepthi Atiygalle Dr. Nalini Redingo National Hospital Colombo 07.	An investigation of magnesium sulphate therapy for the control of spasms and autonomic dysfunction in severe tetanus. 03 months	41500
RG/96/M/12	Dr.(Ms) MB Gunasekera Dr. Nalin C W Goonesekera Dept. of Chemistry Univ. of Colombo Colombo 03	Development of DNA markers for the Sri Lankan population for human identification 3 years	1213280
RG/96/M/13	Dr(Ms) P Pihawadana Epidemiological Unit 231, De Saram Place Colombo 10.	A study on industrial injuries and effectiveness of an intervention programme on injury prevention 02 years	97800
RG/96/M/14	Prof(Ms) Shanthi Mendis Dept. of Medicine Prof. U Samarajeewa Dept. of Food Science & Technology Prof. R O Thattil Dept. of Crop Science Univ. of Peradeniya	The short term and long term effects of daily consumption of coconut fat, soyabean fat and sesame oil on plasma lipids and lipoproteins of healthy adults, patients with ischemic heart disease and patients with hyperlipidemia 1 year 06 months	442000

(IX)

RG/96/M/15	<p>Dr. Sirimali Fernando Prof. U T Vitarana Dept. of Microbiology Fac. of Medical Sciences Univ. of Sri Jayawardenapura</p>	<p>Detection of antibodies to Hepatitis C virus in a cohort of high risk individuals in Sri Lanka. 2 years</p>	666566
RG/96/M/16	<p>Dr(Ms) Nalinie Wickremasinghe Dept. of Biochemistry Fac. of Medicine Ms. A G D H Seneviratne Dept. of Zoology Fac. of Science Univ. of Sri Jayawardenapura</p>	<p>The effects of garlic on hepatocarcinogenesis in normal and hypercholesterolemic rats 2 years</p>	371000
RG/96/M/17	<p>Prof. H R Seneviratne Dept. of Obstetrics & Gynaecology Faculty of Medicine Univ. of Colombo Kynsey Road, Colombo 08 Dr. D M S Fernando Dept. of Physiology Fac. of Medical Science Uni. of Sri Jayawardenapura</p>	<p>A study on the incidence, risk factors and possible treatment interventions of immunological subfertility 2 years & 6 months</p>	1224075

New Grants Awarded in 1996

Discipline - Physical, Engineering, Mathematical Sciences & Built Environment

Grant No.	Grantee/Institute	Title & Duration	Total Allocation Rs.
RG/96/P/01	Dr J.K.D.S. Jayanetti Department of Physics University of Colombo Colombo.	Determination of the effect of grain size of bronze on the reactivity of bronze coated aluminium plates. 02 years	54500
RG/96/P/02	Mr G.H.P. Dharmaratna Mr K.R. Abhayasinghe Bandara Dept. of Meteorology Colombo 7.	To study the characteristics of locations struck by lightning and develop a method to forecast lightning activity using meteorological and environmental parameters. 02 years	239800
RG/96/P/03	Dr W.L. Sumathipala Department of Physics Open University of Sri Lanka, Nugegoda.	Study of climate trends over South Asia and their influence on Sri Lanka. 02 years	142000
RG/96/P/04	Dr T.R. Ariyaratne Department of Physics University of Colombo	Characterization of the fast heavy ion induced photon emission from amino acids. 03 years	594000
RG/96/P/05	Dr C.A.N. Fernando Department of Physics University of Ruhuna	High efficiency photovoltaic cells related to p-CuSCN, p-CuI, n-TiO ₂ , n-Cu ₂ O sensitized with ordered and disordered molecular arrangements at low cost. 02 years	454090

RG/96/P/06	Dr D.U.J. Sonnadara Department of Physics University of Colombo Dr M.K. Jayananda Department of Physics Univ. of Sri Jayewardenepura	Development of data acquisition and control systems for personal computers. 02 years	130000
RG/96/E/04	Dr. K.D.W. Nandalal Fac. of Engineering Univ. of Peradeniya Mr. S. W. Ediriweera H.A.O & M Office of MASL Digana Villagekandy	Investigation of quality parameters of the Mahaweli water from the Polgolla barrage to the Kalawewa reservoir under various operation conditions 02 years	546750

New Grants Awarded in 1996

SAREC Projects

Grant No.	Name/Address	Title/Duration	Total Allocation Rs.
SAREC/BF/Phase/III	Dr. H Abeygunawardena University of Peradeniya	Buffalo Information Dissemination Programme	3.3 m
SAREC/CE/13/1	Dr.(Ms) P Ruchira T. Cumararatunga University of Ruhuna	Pelagic productivity plankton, fish population dynamics, small pelagic fisheries and fish resources	2.6 m
SAREC/CE/13/2	Dr. Pauline Dayaratne NARA	Research on the Natural Resources, Management in the coastal environment of Sri Lanka	
SAREC/EP/01	Dr. Z Mohamed TRI	Solar Energy in tea Drying Process	2.2 m
SAREC/EP/02	Mr. S Fernando SLEMA	Energy Efficiency in Buildings	0.7 m
SAREC/S&T	Director General NARESA	Computerized S & T Information Programme	7.5 m
SAREC/15	Director General NARESA	International Travel Fund	2.5 m

(XIII)

Grants sponsored by NARESA

Status summary during 1996

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
Total No. of grants operating during 1996	07	26	25	04	03	48	22	17	20	04	03
Grants awarded - 1996	03	04	05	01	03	18	07	02	08	01	02
Amount allocated for 1996 (new and ongoing Rs.)	1945000	2259020	2973700	281971	355750	5650703	2752440	224400	3343169	100000	907750
Grants completed - 1996	-	06	04	01	-	08	05	03	-	-	-
Grants withdrawn - 1996	-	-	-	-	-	01	-	-	01	-	-
Grants terminated - 1996	-	-	-	01	-	01	-	-	-	-	-
RA's appointed - 1996	05	01	05	01	03	-	01	01	02	01	01
Thesis PG - 1996	-	01	03	-	-	-	01	-	-	-	-
Registered for PG - 1996	-	-	-	-	-	-	-	-	-	-	01
New applications 1997	11	07	09	02	-	31	11	09	06	-	-
Funds requested for 1997 (Rs)	4379500	1606860	1894350	500000	-	3874753	1672700	1487010	2657641	45000	-
Grants approved for - 1997 (up to January)	02	03	07	-	-	07	04	-	04	01	-

(X)

Grants sponsored by Foreign Agencies

Status summary during 1996

Foreign Agency/Discipline Status	SAREC Research Programme	Buffalo Programme	SAREC Ecology Programme	Coastal Research Programme	SAREC Renewable Energy & Energy Efficiency	ODA - Flora of Sri Lanka Project	Mac Foundation	Arthur
Total No. of grants operating during 1996	25	03	02	01	01	01	01	
Grants awarded - 1996	-	-	-	-	-	-	-	-
Amount allocated - 1996 (new and ongoing Rs.)	03.3 m	02.5 m	2880000	1864420	Inclusive of funds disbursed by Botanic Gardens	606713		
Grants completed - 1996	10	-	-	-	01	-	-	-
Grants withdrawn - 1996	-	-	-	-	-	-	-	-
Grants terminated - 1996	-	-	-	-	-	-	-	-
RA s appointed - 1996	03	02	-	-	-	-	-	-
Registered for PG - 1996	-	02	-	-	-	-	-	-
Thesis PG - 1996	-	-	01	-	-	-	-	-
New Applications - 1997 (Rs.)	-	02	02	-	-	-	-	-
Funds requested for 1997 (Rs.)	-	15 m	2568504	3210635 SEK by SLEMA	-	-	-	-
Grants approved for - 1997 (upto January)	-	approval awaited	-	-	-	-	-	-

(XI)

NATURAL RESOURCES ENERGY & SCIENCE AUTHORITY OF SRI LANKA

Balance Sheet as at 31.12.96

As at 31.12.95 Rs.		Rs.		Rs.
	Funds Employed			
(14,513,826.31)	NARESA Fund	(18,033,338.71)		
310000.00	Add: Drawings from Treasury	2090000.00		
(14,203,826.31)				
3829512.40	Less: Excess of Expenditure over income		15943338.71	(23,212,904.48)
(18033338.71)			(7,269,565.77)	
5347361.14	Documentation Unit Capital Fund	5434111.14		
85000.00	Add: Drawings from Treasury	527000.00	5961111.14	
5432361.14			6761.00	5954350.14
1750.00	Less: Net Expenditure - Note 1.1			
5434111.14	Research Grant Fund	6678519.89		
6232755.70	Add: Drawings from Treasury	6452824.00	13131343.89	
16521226.00			9145268.82	3986075.07
22753981.70	Less: Net Expenditure - Note 1.2			
16075461.81	Man & the Biosphere Fund	1950877.32		
6678519.89	Add: Drawings from Treasury	60000.00	2010877.32	
1953028.22			112325.35	1898551.97
125000.00	Less: Net Expenditure - Note 1.3			
2078028.22	Miscellaneous Fund	799663.47		
127150.90	Add: Drawings from Treasury	670000.00	1469663.47	
1950877.32			672124.02	797539.45
841240.14	Less: Net Expenditure - Note 1.4			
525000.00	Scientific Man Power Project Fund	153497.94		
1366240.14	Add: Drawings from Treasury		153497.94	
566576.67				
799663.47	Less: Expenditure			153497.94
153497.94				
153497.94				

1034025.20	Working Committee Fund	1034025.20	1034025.20
-	Add: Drawings from Treasury	-	-
1034025.20	Less: Net Expenditure	1034025.20	1034025.20
1034025.20	Foreign Aid Fund	-	-
59390478.85	Add: Drawings from Treasury	56834562.70	56834562.70
6169502.64	Treasury Deposit	16000000.00	16000000.00
6559981.49	Less: Net Expenditure - Note 1.5	5750383.00	5750383.00
8725418.79	Capital Reserves	78584945.70	78584945.70
56834562.70	Current Liabilities	11098360.97	11098360.97
42250000.00	Creditors	-	-
1752710.89	Accrued Charges	1572621.66	1572621.66
1266285.56	Provisions	647850.37	647850.37
7983802.55	Store - keepers refundable security deposits	4356391.99	4356391.99
3201.34	Tender Deposits	3640.54	3640.54
35450.00	Suspense account	35450.00	35450.00
-		5922.25	5922.25
108143369.29		-	-
=====		-	-
		67486584.73	67486584.73
		44960000.00	44960000.00
		-	-
		6621876.81	6621876.81
		109679596.83	109679596.83
		=====	=====

.K

111585.70	Insurance	110189.11	
74182.00	Water Consumption Charges	30684.20	
262512.00	Security Charges	262863.00	
3097958.69	Depreciation	5360690.75	
323975.19	Sundry Expenses	219266.14	
1157300.50	10% Administration Cost Expenditure	2099633.19	
2862.61	2002+18623.50+1,893,559.13+150+185,298.56 Exhibitions	13286.04	
	Other		10900713.30
2531.26	Science & Technology Indicators Unit	112.50	
18815.25	NARESA Awards	168286.75	
231061.00	Steering Committees Note 1.6	184002.74	
651604.72	Sri Lanka Scientific & Technical Information Centre Note 1.7	688533.71	
45000.00	Consultancies for NARESA Work	125014.00	
834900.27	Subscription to International Scientific Organizations	829967.47	
5000.00	Publications arising out of Steering Committees	8484.50	
18726370.67			2004401.67
(2232284.51)	Excess of Expenditure Over Income		22833063.71
(1597227.89)	Add: Prior Year Adjustments (Net)		(7,040,618.54)
(3829512.40)			(228,947.23)
			(7,269,565.77)

File/F.acct.

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	480,935.00
2. SLSTIC Books	39,199.11
3. SLSTIC Workshops & Seminars	<u>6,761.00</u>
	526,895.11
Less: Cost of Equipment & Books	<u>520,134.11</u>
	<u><u>RS. 6,761.00</u></u>

1.2 Research Grants Expenditure:

Actual Expenditure for the year	9,658,215.60
ADD: Expenditure on Market Garbage Grant	<u>241,971.51</u>
	9,900,187.11
ADD: Provisions for balance funds	-
	<u>9,900,187.11</u>
LESS: Cost of Equipment	<u>43,400.00</u>
	9,856,787.11
LESS: Prior year adjustment (NET)	<u>711,518.29</u>
	<u><u>Rs. 9,145,268.82</u></u>

1.3 Man & the Biosphere Expenditure:

1. MAB/86/01	28,648.00
2. MAB National Committee	<u>87,064.60</u>
	115,712.60
LESS: Prior year adjustment (Net)	<u>3,387.25</u>
	<u><u>Rs. 112,325.35</u></u>

1.4 Miscellaneous Fund Expenditure:

1. Participation in International Scien. Work	80,575.75
2. Seminars & Symposia	478,217.92
3. Special Publications	<u>111,872.62</u>
	670,666.29
ADD: Prior year adjustment (Net)	<u>1,457.73</u>
	<u><u>Rs. 672,124.02</u></u>

1.5 Foreign Aid Expenditure:

SAREC Expenditure	18,285,740.20
LESS: Cost of Equipment	<u>7,446,588.00</u>
	10,839,152.20
ADD: Prior year adjustments (net)	<u>259,208.77</u>
	<u><u>Rs. 11,098,360.97</u></u>

1.6 Steering Committees Expenditure:

1. Agriculture & Animal Husbandry S/C	21,877.31
2. Bio-Technology S/C	13,568.00
3. Biological Sciences S/C	18,550.00
4. Chemical Sciences S/C	9,782.00
5. Editorial S/C	17,402.00
6. Medical & Vet Sciences S/C	13,054.00
7. Natural Resources S/C	27,173.00
8. Physical & Engineering Sciences S/C	8,125.00
9. Social Science S/C	15,805.43
10. Science Education S/C	22,549.25
11. S & T S/C	7,638.75
12. Steering Committee on Energy	<u>8,478.00</u>
	<u><u>Rs. 184,002.74</u></u>

1.7 Sri Lanka Scientific & Technical Information Centre Expenditure:

1. SLSTIC Maintenance & Repairs	80,631.49
2. " Periodicals	96,486.92
3. " IN House printing & Binding	23,998.10
4. " Consumables	359,664.26
5. " Membership	- 3,000.00
6. " Publications & Publicity	118,629.39
7. " Miscellaneous	<u>6,123.55</u>
	<u><u>Rs. 688,533.71</u></u>

2. Assets & the basis of their Valuation

Depreciable assests & 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 assests over their estimated useful lives.

2.1 Debtors

Total Debtors	5,198,896.90
Less: PRovision for doubtful debts	<u>14,185.92</u>
	<u><u>Rs. 5,184,710.98</u></u>

3. Liabilities

3.1 Creditors

Creditors amounted to Rs. 1,572,621.66 represents monies held by NARESA as given below;

1. CSC A/C	93,657.50
2. Sundry Creditors	1,121,798.58
3. Staff Creditors	10,500.00
4. Genetic Resources A/C	104,815.00
5. Mobile Science Exhibition A/C	7,991.46
6. RG/89/IS/03	65.75
7. RG/95/MAR/A/C	<u>233,793.37</u>
	<u><u>Rs. 1,572,621.66</u></u>

3.2 Employees Benefit

All Employees are covered by EPF and ETF except the National Apprenticeship Board Trainees. An approved Medical Scheme is provided in addition to the normal Welfare facilities available.

3.3 Retiring Gratuity

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

Amount paid for the year -	<u>Rs. 73,120.00</u>
Provision for the year	<u>Rs. 516,405.00</u>

4. Publications for the value of Rs. 2,044,195.50
 (valued at sellign price) is available with us.

5. NARESA Owns: 21 Vehicles. They are located as follows:

With NaRESA -	11
With Research Grantees	<u>10</u>
	<u>21</u>

6. Funds drawn from the Treasury during 1995

Consolidated Funds	Rs. 9,799,824.00
	=====

Recurrent Funds	Rs. 15,075,000.00
	=====

Foreign Aid Funds	Rs. 16,000,000.00
	=====

8. 08 Motor vehicles & 02 Motor Bicycles have been revalued during '96.

දුරකථන
අංකය
Telephone

691151

ෆැක්ස් අංකය
පැණ ලිපි
Fax No.

697451

මගේ අංකය
எனது இல.
My No.

EC/R/W/FA/96

ඔබේ අංකය
உமது இல.
Your No.



විගණකාධිපති, දෙපාර්තමේන්තුව
නිදහස් වතුරලය, කොළඹ 7, ශ්‍රී ලංකාව

கணக்காய்வாளர் தலைமை அலுவலகத் திணைக்களம்
சுதந்திர சதுக்கம், கொழும்பு 7, இலங்கை

AUDITOR-GENERAL'S DEPARTMENT
INDEPENDENCE SQUARE, COLOMBO 7, SRI LANKA

දිනය/நிகதி/Date: 25th February, 1999.....

Director General,
Natural Resources, Energy and Science Authority
of Sri Lanka.

REPORT OF THE AUDITOR GENERAL ON THE ACCOUNTS OF THE
NATURAL RESOURCES, ENERGY AND SCIENCE AUTHORITY OF
SRI LANKA FOR THE YEAR ENDED 31 DECEMBER 1996 IN TERMS OF
SECTION 14(2)(C) OF THE FINANCE ACT NO. 38 OF 1971.

The audit of accounts of the Natural Resources, Energy and Science Authority of Sri Lanka for the year ended 31 December 1996 was carried out under my direction in pursuance of provisions in Article 154(1) of the Constitution of the Democratic Socialist Republic of Sri Lanka read in conjunction with Section 13(1) of the Finance Act No. 38 of 1971. My observations which I consider should be published with the annual report of the Authority 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 forwarded to the Director General of the Authority on 29 August 1997.

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 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. Sub-sections (3) and (4) of Section 13 of the Finance Act give discretionary powers to the Auditor General to determine the scope and extent of the audit.

2. Accounts

2:1 Opinion

Subject to my comments appearing in this report, I am of opinion that the accounts presented have been satisfactorily prepared on the basis of generally accepted accounting principles applied on a basis consistent with that adopted in the preceding year.

2:2 Financial Results

The activities of the Authority are operated under General Fund and six Special Fund Accounts. According to the accounts furnished, the financial results arising out of the activities of the Authority's General Fund for the year ended 31 December 1996 was a deficit of Rs. 22,115,619 as compared with the deficit of Rs. 16,792,285 for the previous year, before taking into account the Government Grant for Recurrent Expenditure. After taking into account the Government Grant of Rs. 15,075,000 received for recurrent expenditure for the year under review the deficit for the year had decreased to Rs. 7,040,619 and after taking into account the Government Grant of Rs. 14,560,000 received for recurrent expenditure for the preceding year, the deficit for that year had decreased to Rs. 2,232,285.

The financial result of the activities under special funds was a deficit of Rs. 21,034,840 before taking into account the government grant and foreign aid for activities of the special funds as compared with a deficit of Rs. 25,494,609 for the preceding year. After taking into account the government grant (including foreign aid) of Rs. 29,460,207 received for the activities of the special funds for the year under review, the surplus for the year was Rs. 8,425,367. After taking into account the government grant (including foreign aid) of Rs. 23,427,479 received for the activities of the special fund for the previous year, the deficit for that year had been decreased to Rs. 2,067,130.

2.2.1 General Fund

A summary of the financial results of the General Fund for the year under review and the preceding year is shown below.

	Year ended 31 December			
	1996	1995		
	Rs.	Rs.	Rs.	Rs.
<u>Income</u>				
Receipts regarding foreign aid administration cost	-		1,144,481	
Sale of publications	279,024		284,805	
Interest on loans	164,168		137,672	
Provision of printing services to outsiders	211,730		184,640	
Receipts from photocopies	7,150		5,797	
Miscellaneous	28,546		117,153	
Profit from sale of fixed assets	26,827		21,492	
Investigation income received from outside jobs	-	717,445	38,046	1,934,086
<u>Expenditure</u>				
Office administration	10,900,713		7,813,403	
Staff salaries	9,848,518		8,992,977	
Board of control	79,431		131,078	
Others	2,004,402	22,833,064	1,788,913	18,726,371
Deficit before Government grant		(22,115,619)		(16,792,285)
Less: Government grant for recurrent expenditure		15,075,000		14,560,000
Deficit for the year		(7,040,619)		(2,232,285)
Balance of the Fund Brought forward	(18,033,339)		(14,513,826)	
Prior period items	(228,947)		(1,597,228)	
Grants received from the Treasury	2,090,000	(16,172,286)	310,000	(15,801,054)
Balance of the Fund carried forward		(23,212,905)		(18,033,339)

2:2:2 Special Funds

The following statement shows the financial results of each special fund for the year under review and the preceding year.

	Year ended 31 December			
	1996		1995	
	Rs.	Rs.	Rs.	Rs.
<u>Research Grant Fund</u>				
Government grant	6,452,824		16,521,226	
Less : Expenditure	<u>9,145,269</u>		<u>16,075,462</u>	
Surplus/(deficit)		(2,692,445)		445,764
<u>Documentation Unit Capital Fund</u>				
Government grant	527,000		85,000	
Add/(less): Expenditure (Prior year adjustments)	<u>6,761</u>		<u>1,750</u>	
Surplus		520,239		86,750
<u>Foreign Aid Fund</u>				
Receiv Prs of Foreign Aid	16,000,000		6,169,503	
Treasury deposits	<u>5,750,383</u>		<u>-</u>	
	21,750,383		6,169,503	
Less : Expenditure	<u>11,098,361</u>		<u>8,725,419</u>	
Surplus/(deficit)		10,652,022		(2,555,916)
<u>Man and Biosphere Fund</u>				
Government grant	60,000		125,000	
Less : Expenditure	<u>112,325</u>		<u>127,151</u>	
Surplus		(52,325)		(2,151)
<u>Miscellaneous Fund</u>				
Government grant	670,000		525,000	
Less : Expenditure	<u>672,124</u>		<u>566,577</u>	
Surplus/(deficit)		(2,124)		(41,577)
Net surplus/(deficit) from special funds		<u>8,425,367</u>		<u>(2,067,130)</u>

Contd...05/

2:3 Financial Structure

According to the accounts presented, the financial structure of the Authority as at 31 December 1996 as compared with that as at 31 December 1995 is shown below.

	<u>As at 31 December</u>	
	<u>1996</u>	<u>1995</u>
	Rs.	Rs.
<u>Resources</u>		
Capital reserve	44,960,000	42,250,000
General fund of the Authority	(23,212,905)	(18,033,339)
<u>Special Funds</u>		
Foreign Aid Fund	67,486,585	56,834,563
Research Grants Fund	3,986,075	6,678,520
Documentation Unit		
Capital Fund	5,954,350	5,434,111
Man and Biosphere Fund	1,898,552	1,950,877
Miscellaneous Fund	797,540	799,664
Working Committee Fund	1,034,025	1,034,025
Scientific Manpower Project Fund	153,498	153,498
	<u>103,057,720</u>	<u>97,101,919</u>
<u>Utilisation</u>		
Fixed assets (at written down value)	61,294,894	53,678,901
Net current assets	41,762,826	43,423,018
	<u>103,057,720</u>	<u>97,101,919</u>

2:4 Cash Flow

According to the accounts presented, the cash flow of the Authority during the year under review and the preceding year are shown below.

	Year ended 31 December			
		<u>1996</u>	<u>1995</u>	
	Rs.	Rs.	Rs.	Rs.
<u>Cash Flow from Operating Activities</u>				
Net deficit for the year (Note 1)		(7,040,619)		(2,232,285)
<u>Adjustments for items not involving movement of cash</u>				
Provision for gratuities	516,405		663,600	
Depreciation for the year	5,360,691		3,097,959	
Adjustments for profits on sale of fixed assets	(26,827)	5,850,269	(21,492)	3,740,067
		(1,190,350)		1,507,782
Prior period items	(228,947)		(1,597,228)	
Add : Transactions not affected the cash flow	(88,152)	(317,099)	864,204	(733,024)
<u>Operating surplus/(deficits) before changes in terms of working capital</u>		(1,507,449)		774,758
<u>Changes in items of Working Capital</u>				
Decrease in stocks	49,117		184,894	
Increase in debtors	(1,172,933)		(1,647,695)	
Increase in pre-payments	(62,325)		(57,571)	
Decrease in creditors	(180,089)		1,507,264	
Decrease in accrued expenses	(618,435)		384,944	
Increase in other liabilities	5,921		-	
Provisions	-		4,497,406	
Deposits	(3,627,411)		(5,000)	
Tender deposits	-		26,000	
Security deposits	440		392	
Treasury deposits	(5,750,383)	(11,356,098)	5,275,311	10,165,945
		(12,863,547)		10,940,703
		(73,120)		(64,300)
Payment of gratuities		(12,936,667)		10,876,403
Cash generated from/(used in) operating activities				

Contd...07/

Cash Flows from Investing Activities

Purchase of fixed assets	(2,158,591)	
Proceeds from sale of fixed assets	<u>21,964</u>	
Cash used in investing activities		<u>(2,136,627)</u>
		8,739,776

Cash Flows from Financing Activities

Government grant	310,000	
Foreign aid	6,169,503	
Research Grant Fund	445,764	
Documentation Unit Fund	85,000	
Man and Biosphere Fund	(2,151)	
Miscellaneous Funds	(41,577)	
Foreign aid (expenditure)	<u>(8,725,419)</u>	
Cash generated from/(used in) financing activities	<u>10,528,059</u>	
Net decrease/increase in cash and cash equivalents	(13,016,290)	
Balance of cash and cash equivalents at beginning of the year	14,430,521	
Balance of cash and cash equivalents at end of the year (Note I)	<u>1,414,231</u>	<u>14,430,521</u>

Note I

Cash and Cash Equivalents

Bank balance	01.01.1996	
Petty cash balance	(4,652,258)	
Cash in hand	12,500	
Balance in the savings account	19,067,078	
	<u>3,201</u>	
	<u>1,414,231</u>	<u>14,430,521</u>

2:5 Comments on Accounts

2:5:1 Accounting Policies

Although a provision of Rs. 14,186 had been made for bad debts, the basis of estimation had not been disclosed.

2:5:2 Accounting Deficiencies

The following accounting deficiencies were observed.

- (a) The difference of the trial balance amounting to Rs. 5,922 had been credited to the suspense account, and shown as a creditor balance instead of being shown separately in the balance sheet until the balances are identified subsequently.
- (b) In 4 instances, capital expenditure aggregating Rs. 10,720 relating to several items of expenditure had been charged to the revenue of the year through maintenance of office equipment account and the maintenance of buildings account, instead of being debited to the relevant accounts.
- (c) A sum of Rs. 5,500 which should be debited to the prior year adjustment account had been debited to research project control account.
- (d) Insurance claims receivable in respect of a vehicle which had met with an accident during the year of accounts had not been assessed and brought to accounts.
- (e) Provisions had not been made for the following liabilities existed as at 31 December 1996.
- | | | |
|--|---|------------|
| (i) Amount payable to the National Building Research Organisation in respect of a workshop conducted |) | |
| |) | |
| |) | Rs. 10,000 |
| (ii) Retention money deducted from the payments to contractors |) | |
| |) | |
| |) | Rs. 4,498 |

Contd...09/

(f) The entire funds released to the Universities and other institutions for research activities had been accounted for as expenditure of the year under review. However, it was observed at test checks that out of the total funds amounting to Rs. 1,969,265 released during the year under review, only a sum of Rs. 259,570 had been spent.

2:5:3 Assets at Book Value

Although it has been reported that a physical verification of fixed assets as at 31 December 1996 had been carried out in 1997, the fixed assets had been shown in the accounts at book value.

2:5:4 Unexplained Differences

According to accounts, the value of Treasury deposits amounted to Rs. 40,289,075 whilst the balance confirmed by the Treasury was Rs. 40,136,452. The difference of Rs. 152,463 had not been explained.

2:5:5 Lack of Evidence for Audit

Assets valued at Rs. 93,684,078 debtors amounting to Rs. 727,751, imprests aggregating Rs. 2,061,799 released to researchers and balance of the bank current account amounting to Rs. 1,132,225 could not be satisfactorily vouched or accepted in audit due to absence of board of survey reports and confirmations as relevant.

2:5:6 Non-compliance with Laws, Rules, Regulations and Management Decisions.

Following instances of non-compliance were observed in audit.

Reference to Laws,
Rules, Regulations etc.

Particulars

(a) Finance Act.

(i) Section 8 (3)

A draft income and expenditure account and a projected balance sheet had not been prepared with the budget for 1996.

(ii) Section 13(5)(b)

Minimum internal audit programmes had not been determined by the Authority with the concurrence of the Auditor General.

(iii) Section 13(6)

The report on accounts had not been forwarded together with the accounts for the year 1996.

(b) Section 50 of the Turnover Tax Act No. 69 of 1981 and the Gazette No. 714/13 of dated 14 May 1992.

Turnover tax amounting to Rs. 13,143 had not been recovered and remitted to the Commissioner General of Inland Revenue in making payments for security services of the Authority.

(c) Financial Regulations

(i) FR 371

Balances remaining out of the advances paid should be returned to the Institution immediately after the task is completed. However, imprest advances of Rs. 54,508 paid to research officers remained unsettled for period of 1 to 7 years.

(ii) FR 1646

Vehicle log books had not been maintained in Form General 267.

(d) Establishments Code

(i) Section 2:10 of Chapter VI

According to Section 2:10 of Chapter VI, particulars of every appointment, termination of service, disciplinary action, resignation, retirement, death etc. should be reported to the Auditor General. However, it had not been complied with.

(ii) Section 10:3 of
Chapter VIII

There were instances where authority had not been obtained to work on week-ends and public holidays and a register had not been maintained to record the details of work done.

(e) Treasury Circulars

(i) No. 44 of
25 September 1987

Accounts had not been prepared in general format specified by the Treasury.

(ii) No. 842 of
19 December 1987

Action had not been taken in terms of the schedules of the Circular in respect of fixed assets released to the Ministry of Science and Technology.

(iii) No. 222 of
12 June 1984

Although only 20% of the contracted amount can be paid as mobilisation advances, the Authority had paid more as advances in respect of constructions and services.

(f) Public Administration Circulars.

(i) No. 148 of
16 October 1997

An expenditure of Rs. 11,010 had been incurred in respect of liquor served at various functions held by the Authority.

(ii) No. 7/92 of
18 February 1992

The Chief Accountant and two Directors had used official vehicles to travel between the residence and office without the Cabinet approval.

(iii) No. 6/93 of
5 April 1995

A sum of Rs. 7,625 in excess of the charges specified had been paid in respect of a disciplinary inquiry conducted by the Authority.

(iv) No. 105 of
20 November 1995

The Authority had granted a donation of Rs. 50,000 to the Institute of Chemistry during the year under review without the Cabinet approval.

(g) Public Enterprises Circulars

No. 108 of 21 May 1996

Although Corporations/Statutory Boards should not grant donations and/or gifts out of its funds, the Authority had donated a sum of Rs. 40,000 during the year under review.

Contd...13/

3. Financial and operating review

3:1 Financial results

The activities of the Authority during the year under review had resulted in a deficit of Rs. 7,040,619 as compared with a deficit of Rs. 2,232,285 in the previous year thus showing a further deterioration in financial results by Rs. 4,808,334. It could be analysed as follows.

<u>Income</u>	<u>Variance</u>		Rs.
	<u>Favourable</u>	<u>Advance</u>	
	Rs.	Rs.	
Receipts regarding foreign aid Administration cost	-	1,144,480	
Sale of publications	-	5,780	
Interest of loans	26,496	-	
Provision of printing services to outsiders	27,090	-	
Receipts from photocopies	1,353	-	
Miscellaneous	-	88,608	
Profit on sale of fixed assets	5,334	-	
Investigation income from outside activities	-	38,046	
Government grant for recurrent expenditure	515,000	-	
	<u>575,273</u>	<u>1,276,914</u>	(701,641)
 <u>Expenditure</u>			
Office administration	-	3,087,310	
Staff salaries	-	855,541	
Board of control	51,647	-	
Others	-	215,489	
	<u>51,647</u>	<u>4,158,340</u>	<u>(4,106,693)</u>
Net deterioration in financial results			<u><u>(4,808,334)</u></u>

3:2 Adjustment of Financial Results

The financial results and the financial positions disclosed in the accounts for an accounting period had been adjusted for accounting deficiencies, omissions etc. observed in subsequent years as a regular feature of the Authority. For instance, the net deficit for the preceding year had been adjusted by Rs. 228,947 during the year under review. Such adjustments made during the 4 preceding years are shown below.

Year	Financial Results as per Accounts <u>(Deficit)/Surplus</u>	Adjustments made in the Subsequent <u>year</u>	(Deficit)/Surplus after Adjustments
	Rs.	Rs.	Rs.
1991	(2,870,487)	(42,276,985)	(45,147,472)
1992	(3,800,520)	(63,901)	(3,864,421)
1993	(4,364,152)	(379,802)	(4,743,954)
1994	(4,789,206)	(1,597,228)	(6,386,434)

In this context, similar adjustments to the financial results shown in the accounts for the year under review in subsequent years cannot be ruled out. As a result of these adjustments, the deficits shown in the accounts for the years 1991, 1992, 1993 and 1994 respectively amounted to Rs. 45,147,472, Rs. 3,864,421, Rs. 4,743,954 and Rs. 6,386,434.

Contd...15/

3:3 Performance

The Authority assists individuals and institutions for research activities. According to the information furnished, the particulars of research projects carried out during the year under review compared with those of the preceding year are given below.

Research Project	Projects Funded by NARESA		Projects Funded by Foreign Institutions	
	1996	1995	1996	1995
Projects in progress at the commencement of the year.	119	89	7	40
Researches newly commenced during the year.	<u>55</u> 174	<u>67</u> 156	<u>-</u> 7	<u>1</u> 41
No. of research Projects completed during the year.	30	34	1	-
Projects abandoned during the year.	2	1	-	-
Projects withdrawn during the year.	<u>1</u> 141	<u>2</u> 119	<u>-</u> 6	<u>-</u> 41

The Authority had granted a sum of Rs. 9,885,435 and foreign institutions had granted a sum of Rs. 18,285,740 in respect of the research projects for the year under review.

Contd... 16/

344 Project Administration

The following deficiencies were observed at a test check carried out in respect of research projects conduct by the Authority.

- (a) Although the due dates of the final reports that should be sent after completion of the researches of projects had lapsed, the officers in charge of the projects bearing the following Project numbers had not sent the reports in due dates.

<u>No. of the Project</u>	<u>Grant</u>	<u>Due date of the Report</u>	<u>The Date on which Report was furnished</u>
	Rs.		
RG/92/SS/003	7,500	01.01.1994	The report had not been furnished upto August 1997.
RG/92/M/05	155,989	23.12.1993	October 1997
RG/92/M/06	310,800	28.12.1995	February 1998
RG/92/M/08	398,400	15.08.1996	Abandoned in July 1998
RG/93/M/02	90,000	18.10.1995	July 1998

- (b) Researches of certain projects had been abandoned half-way and instances were observed where the money released to these projects had been retained in the institutions to which the Project Officers were attached.

Details are shown below.

<u>No. of Project</u>	<u>Grant</u>	<u>Expenditure</u>	<u>Amount</u>
		<u>Incurred</u>	<u>Retained</u>
	Rs.	Rs.	Rs.
RG/92/AP/04	56,500	50,557	5,943
RG/92/C/10	101,100	92,763	8,337
RG/95/M/10	566,250	58,385	507,865
SAREC/9/BF/77	195,600	91,060	104,540
SAREC/9/BF/70	90,240	71,504	18,734
RG/93/E/03	10,760	Nil	10,760

Contd...17/

- (c) Although funds had been released for the following projects, no progress had been reported upto end of the year under review.

<u>No. of the Project</u>	<u>Grant</u>	<u>Expenditure</u>	<u>Progress</u>
	Rs.	Rs.	Rs.
RG/93/E/01	10,000	Not reported	Not reported
RG/94/C/02	54,000	- do -	- do -
RG/94/SS/03	19,500	- do -	- do -
RG/95/SS/03	8,820	- do -	- do -

- (d) Funds had been released to various institutions including Universities for projects. Instances were observed where reports on expenditure incurred out of these funds had not been furnished upto August 1997. Details are shown below.

<u>No. of the Project</u>	<u>Grant</u>	<u>Institution</u>	
	Rs.		
RG/96/C/01	83,250	University of Peradeniya) Expenditure) returns had) not been) submitted.
RG/96/M/01	152,750	- do -	
RG/96/G/06	70,000	University of Colombo	
RG/96/M/06	786,780	Urban Eye Clinic	

- (e) Although the activities of the following projects had been completed, the balances out of the grants had not been returned to the Authority.

<u>No. of the Project</u>	<u>Grant</u>	<u>Expenditure</u>	<u>Balance</u>
	Rs.	Rs.	Rs.
SAREC/9/BF/70	90,240	71,504	18,736
SAREC/9/BF/77	195,600	91,060	104,540

- (f) Imprests given to officers for the following projects had remained unsettled for a long period.

<u>No. of the Project</u>	<u>Amount Unsettled</u>	<u>Period Lapsed.</u>
	Rs.	Years
RG/89/SS/01	500	7
SAREC/09/General	3,528	6
SAREC/9/BF/85	50,000	5
SAREC/09/General/74	480	3

3:5 Cost of Personnel

Details of staff of the Authority, normal pay and overtime cost and the average cost per employee for the year under review as compared with those of the preceding year are shown below.

<u>Category of Staff</u>	<u>Salary Cost</u>				<u>Average cost per Employee</u>					
	<u>Number</u>		<u>Normal Time</u>		<u>Normal Time</u>		<u>Overtime</u>			
	<u>1996</u>	<u>1995</u>	<u>1996</u>	<u>1995</u>	<u>1996</u>	<u>1995</u>	<u>1996</u>	<u>1995</u>	<u>Rs.</u>	
Executive	29	33	3,629,312	3,100,726	125,149	93,961	63,190	53,853	846	377
Clerical and Allied Grades	49	46	3,096,309	2,477,259	41,463	17,360	52,882	47,825	12,909	10,658
Minor Employees	17	17	898,996	813,023	181,184	198,544	80,259	66,573	3,953	3,151
	<u>95</u>	<u>96</u>	<u>7,624,617</u>	<u>6,391,008</u>	<u>260,909</u>	<u>219,446</u>	<u>198,544</u>	<u>181,184</u>	<u>80,259</u>	<u>66,573</u>

Contd...19/

3:6 Vehicle Utilisation

The Authority had 21 vehicles during the year under review. Out of this, 11 vehicles had been used for the services of the office and 10 vehicles had been released to research projects. According to the information made available, data relating to the utilisation of 11 vehicles consisting of 9 passenger vehicles and 2 motor bicycles that had been put to use of the office as compared with the preceding year are shown below.

	<u>1996</u>		<u>1995</u>	
	Passenger Vehicles	Motor Bicycles	Passenger Vehicles	Motor Bicycles
Number of vehicles utilised.	9	2	7	2
(a) Distance travelled				
Petrol - Km	43,119	5,409	37,849	2,602
Diesel - Km	36,144	-	35,679	-
(b) Fuel consumed				
Petrol - Litres	6,430	203	6,300	105
Diesel - Litres	3,736	-	2,814	-
(c) Average distance travelled per litre of fuel				
Petrol - Km	6.70	26.64	6.01	24.78
Diesel - Km	9.67	-	12.68	-
(d) Total expenditure on fuel				
Petrol - Rs.	273,669	8,680	252,898	4,200
Diesel - Rs.	59,761	-	42,411	-
(e) Total expenditure on repairs and maintenance				
Petrol - Rs.	244,265	-	195,025	5,207
Diesel - Rs.	456,173	-	86,053	-

(f) Total expenditure on drivers' salaries, batta and overtime.				
Petrol - Rs.	171,467	-	74,136	-
Diesel - Rs.	241,101	-	31,709	-
(g) Provision for depreciation				
Petrol - Rs.	-	-	-	-
Diesel - Rs.	-	-	-	-
(h) Total Cost				
Petrol - Rs.	689,401	-	522,059	9,407
Diesel - Rs.	757,035	-	160,173	-
(i) Average expenditure on fuel per kilometre				
Petrol - Rs.	6.34	1.60	6.68	1.16
Diesel - Rs.	1.65	-	1.19	-
(j) Average expenditure on repairs per kilometre				
Petrol - Rs.	5.66	-	5.15	2.00
Diesel - Rs.	12.62	-	2.41	-
(k) Average expenditure on drivers' salaries, batta and overtime per kilometre				
Petrol - Rs.	3.97	-	1.96	-
Diesel - Rs.	6.67	-	0.89	-
(l) Overall average expenditure per kilometre				
Petrol - Rs.	15.98	-	13.79	3.62
Diesel - Rs.	20.94	-	4.49	-

Note : Adequate information to show the performance of vehicles released to the research projects had not been furnished to audit.

3:7 Budgetary Control

Significant variances were observed between the estimated and actual income and expenditure. Therefore, it was observed that the budget had not been made use of 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 the Director General of the Authority 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) Accounts
- (c) Debtors and Creditors
- (d) Assets
- (e) Research Projects

S.M. Sabry,
Auditor General.

-/dk.

Comments on the Auditor General's Report on the Accounts for the year ended 31st December 1996.

2:5 Comments on Accounts

Accounting Policies

2:5:1 Doubtful Debts - RS. 14,186/=
 We are now disclosing the basis of estimation in our Final Accounts.

2:5:2 Accounting Deficiencies

a) Suspense Account - RS. 5922/=
 We are now showing the suspense account separately in the balance sheet.

b) RS. 10,720/= has been paid for the purchase of 4 Nos. of Glass Globe. We have capitalized this item in 1997.

RS. 10,720/= has been paid by one voucher & not in 04 instances as stated by the Auditor General. Also we have not charged to the revenue of the year through maintenance of office equipment account and the maintenance of building account as stated by the Auditor General. We have debited the maintenance of building account with RS. 10,720/= in 1996.

f) 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. The figure of RS. 259,570/= reported is incorrect.

2:5:4 Unexplained Variations

The difference of RS. 152,623/= is due to the fact that NARESA shows the Treasury deposit taking into account the funds drawn from the Treasury. But the Treasury takes into account the expenditure of NARESA when confirming the Treasury deposit balance.

2:5:5 Lack of evidence for Audit

Assets - A Physical Verification has been carried out during 1997, to verify the following assets as at 31.12.96.

- | | | |
|----|---------------------------------------|--------------------------------------|
| 1. | Office furniture fittings & equipment | |
| 2. | Motor Vehicles | } In the premises of our Institution |
| 3. | Motor Bicycles | |
| 4. | Push Bicycles | |
| 5. | Miscellaneous & Accessories | |
| 6. | Documentation equipment | |
| 7. | Stock | |
| 8. | Library Books | |

Cash Imprest - We have requested to certify balances. Only few replies have been received.

Bank current account - We have received confirmations from the Bank & a copy has been given to the Auditors

2:5:6 Non- Compliance with Laws, Rules, Regulations and Management Decisions.

- a) **Finance Act.**
- i) We prepare the Budget according to the format required by the Ministry / Treasury
 - ii) Our Internal Audit Program was submitted to the Auditor General on 27.10.95 with a copy to the Secretary, Ministry of Science & Technology. This Internal Audit Program was approved by the Board of Management on 10.11.95.
 - iii) A copy of the draft annual report of 1996 has been sent to the Auditor General on 29.04.97.
- b) There is no annual contract for the Security Service. Payments are made on monthly bills.
- c) **Financial Regulations**
- i) RS. 50,000/= out of this RS. 54,508/= has been settled on 25.06.97.
 - ii) Separate files have been maintained for each vehicle to record all necessary information.
- d) **Establishment Code**
- (i) Auditor General has been informed with regard to the appointments made to the institution. Arrangements have been made to forward the details with regard to the resignations, retirements & disciplinary actions.
 - (ii) A file is maintained to record the details of all overtime work. No separate register is maintained to record the attendance of the overtime work. Attendance of overtime work is marked in the main attendance register, (Time recording machine) As a practice relevant approval is obtained to work during weekends and Public Holidays.
- e) **Treasury Circulars**
- (i) In 1996 also we prepared the accounts according to the format we have been preparing for the past so many years.
 - (ii) Ministry of Science & Technology has returned to us all office furniture fittings & equipment in 1994 except for the Sony Micro Cassette Recorder Mod M5 purchased for RS. 2603/=
 - (iii) We have not been practicing this procedure. We will follow it in the future.
- f) **Public Administration Circulars**
- (i) RS. 11,010/=
 - RS. 3895/= This expenditure was incurred for the dinner organized in view of the Coastal Ecology Regional Workshop. Foreign participants including Swedish Scientists attended the dinner. This Workshop was funded by SIDA - Swedish Funds and not with Local Funds. The liquor was purchased outside the hotel for Cheaper cost. No Corkage was paid
 - RS. 7,115/=
 - Out of the RS. 7115/= only RS. 4950/= (RS. 4800/= + RS. 150/=) has been utilized to purchase Beer. The expenditure of RS. 4800/= has been incurred for the dinner held in view of the Regional Seminar on Forest of the Humid Tropics of South East Asia, Foreign participants attended this dinner. Funds were received for this workshop from UNESCO.
- Hence only RS. 8845/= has been spent on liquor & not RS. 11010/= as reported.

- (ii) Considering the provision of the Public Administration Circular No. 264 dated 15.08.84, the Authority has decided to grant permission to senior officers to use office vehicles for travelling between residence and office. Only Grade I officers are provided with this facility.
- (iii) Considering the rates applied by the similar institutions coming under the Ministry of Science & Technology the Authority made a decision to make this payment to the inquiring officer and the prosecuting officer. No other payments were made for travelling, subsistence etc.
- (iv) We have not donated RS. 50,000/- to the Institute of Chemistry. But we have paid RS. 50,000/- to the Institute of Chemistry to conduct the 'Chemistry Magic' program which would promote Chemistry and Chemical principles among the younger generation.

Public Enterprises Circulars

We have not granted donations or gifts out of our funds. But we have given funding assistance of RS. 40,000/- for Scientific Activities.

RS. 10,000/- to SLAAS	- For the popularization of Science activities
RS. 25,000/- to NBRO	- For the Awareness program on landslides
RS. 5,000/- to SLMA	- NARESA organized a stall to sell NARESA Publications. The RS. 5,000/- paid is the cost of participation at the SLMA. Value of publications sold at this stall is RS. 8075/-

RS. 40,000/-	

Project Administration

a) RG/92/M/08	- This grant has not been abonded, but it had been terminated
RG/93/M/02	- Final report has been received in January 98 and not in July 98 as reported.
b) RG/92/Ag/04	- RS. 5,943/- - Funds received from University of Ruhuna on 21.10.96 (Grant No. reported is incorrect)
RG/92/C/10	- RS. 8337/- - Funds received from Univ. of Sri Jayawardenepura on 31.10.95
RG/95/M/10	- RS. 507,865/- - Funds received from Univ. of Peradeniya on 19.09.96
SAREC/9/BF/77	- RS. 104,540/- } - Funds received from Univ. of
SAREC/9/BF/70	- 18,734/- } - Peradeniya on 3-6-98
RG/93/E/03	- RS. 10,760/- - Funds received from Univ. of Moratuwa on 10.01.96.
RG/93/E/01	- Grant completed on 27.06.96. Final Report received.
RG/94/C/02	- A final report has been received in October 97.
RG/94/SS/03	- Univ. of Colombo has refunded the RS. 19,500/- in 1997.
RG/95/SS/03	- Expenditure as at 18.09.96 has been reported in 1997.

- d) RG/96/C/01 - Expenditure statement has been received on 23.10.97.
 RG/96/M/01 - Expenditure statement has been received on 04.11.97.
 RG/96/G/06 - We do not have a grant by this number.
 RG/96/M/06 - Expenditure statement received 02.03.97
- e) SAREC/9/BF/70 - RS. 18,736/- } These funds were refunded by the Univ. of
 SAREC/9/BF/77 - 104,540/- } Peradeniya on 3-6-98
- (f) SAREC/9/BF/85 - RS. 50,000/- - Settled on 25.6.97

3:6 Vehicle Utilization

The information for 09 vehicles which have been released to the grantees (outstations) were not available at the time of audit. The information was received late.

3:7 Budgetary Control

The Budget is prepared almost one year before the expenditure is incurred. As far as possible we use the Budget as an instrument of control.

4. Systems & Control

Auditor General's comments in terms of Section 13 (7) (a) of the Finance Act received our attention. Our reply to these comments were forwarded to the Auditor General by our letter dated 25-11-97.

M. Watson

Director

National Science Foundation