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The Institution

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

Management

The NSF is governed by a Board of Management which consists of the Chairman, Director and four members representing the UGC, NIE, SLAAS, IESL and the Ministry of Finance and four Members appointed by the Minister of Science and Technology. The Director functions as the Chief Executive of the institution.

Our Vision

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

Our Mission

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

Our Functions

Initiate, facilitate and support basic and applied scientific research by universities, science and technology institutions and scientists:

Foster the interchange of scientific information among scientists in Sri Lanka and foreign countries;

Award scholarships and fellowships for scientific study or scientific work at science and technology institutions;

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

Popularize science amongst the people by funding programmes for that purpose.

FINANCIAL PERFORMANCE

Capital (in Rs '000)

Treasury Funds

Grants & Other Scientific Work	27131
Man & Biosphere Programme	583
Sri Lanka Scientific & Technical Information Centre	276
Intellectual Property	7
Seminars & Symposia	98
International Scientific work	128
Office Furniture & Equipment	1304
Rehabilitation of Assets	179
TOTAL	29709

Foreign Funds

R&D Policy Studies and S&T Indicators	581
Sida/ NSF Research Grants	3984
International Travel Funds	5710
Administration	751
TOTAL	11026

Recurrent (in Rs '000)

Staff emoluments	17,042
Supplies	1,359
Services	2,665
Traveling	14
Maintenance	963
Other	2137
Total	24339

CAPACITY BUILDING IN RESEARCH

Research Grants Scheme

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

Research proposals were invited for granting awards on a competitive basis (after a peer-evaluation process). Peers are involved in the progress monitoring and evaluation of final outcome. Despite many advantages of the process such as keeping up the research community by upgrading the knowledge base, infrastructure and training, this process shows its inhibiting short-comings such as;

- Inability to meet wide spectrum of potential researchers,
- Performance is targeted at satisfying the peers.

Noting these short-comings, we introduced new channels of capacity building in research while improving the existing scheme.

Ways of improving the existing system

- Increasing the allowances payable to Research Assistants and Technical assistants to attract better qualified graduates to conduct research.
- Increasing rates for traveling connected to field work
- Proposing new ways of funding research giving more authority to researchers and minimizing bureaucratic barriers.
- Introducing new structure of operation and research areas (promoting multi-disciplinary research and Theme-based research) to avoid research activities done in isolation.

Scholarships and Fellowships

The Scheme for Scholarships and Fellowships is meant for supporting outstanding science graduates/engineers for full time research leading to M.Phil and Ph.D degrees for 2-3 years. The stipend paid to scholars was increased from Rs 12000/- to Rs 15000/- per month and research expenses were increased from RS 50,000/- to Rs 100000/- per year.

Thirty applications were received for consideration by the NSF and ten scholarships were awarded (List of awardees is given in Annexure 8).

The Fellowship Scheme was meant to support outstanding post doctoral scientists/engineers to undertake full time research with a stipend in accordance with university salary scales, and research expenses of Rs 100000/- per year. This was also applicable to persons in the private sector undertaking research in state institutions, university staff on sabbatical leave in the private sector and scientists/engineers returned recently from abroad. However, there were no successful candidates for awarding Fellowships in 2004.

Summary of information on the requests for research grants for the year 2004 is given below.

Discipline	Number of applications	1st year request (Rs '000)	% from the total	avg request per application (Rs '000)	Total request (Rs '000)
Social Science	3	1200	2%	400	1400
Science Education	2	600	1%	300	600
Physics	5	2300	5%	500	4300
Information Tech.	1	300	1%	300	300
Geology & Earth Science	5	3700	8%	700	6400
Engineering & Built Environment	8	4300	9%	500	5100
Chemistry	10	1100	22%	1100	16000
Food Science	2	800	2%	400	2100
Zoology	5	3100	6%	600	5500
Veterinary Science	8	4900	10%	600	6300
Traditional Medicine	3	1500	3%	500	2900
Medicine	24	15000	31%	600	21000
Botany & Microbiology	11	3900	8%	400	7000
Total	87	53000		600	79000

Details of grants awarded in year 2004 are given in the annexure one.

Research Grants Scheme – Summary of out put 2004

Total expenditure on Research	Rs 23.m
Number of continueing Grants (as at 31 Dec 2004)	212
Number of new grants awarded	66
Number of final reports received	29
Research Assistants registered for higher degrees	24
Thesis Submitted	11
Publications (Foreign)	13
Publication (Local)	10
Communications	38
Number of patents granted	02

SIGNIFICANT RESEARCH FINDINGS

This section gives the information on findings of research in the final reports received by the NSF during 2005.

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

Grantees: Dr Nadira Karunaweera, Dr Yamuna Siriwardena
Faculty of Medicine, University of Colombo. (RG/Sida/2002/M/01)

Cutaneous leishmaniasis is an established disease in Sri Lanka, especially in the north-central province [Siriwardane *et al.*, 2003]. Outdoor occupational behaviors, close proximity jungles and lack of awareness are associated risk factors of this infection.

98 patients presented to the department with skin lesions suggestive of cutaneous lesions were included in the study. Out of these laboratory confirmation of cutaneous leishmaniasis was done in 65 patients. Clinical details of these patients with positive smears for *Leishmania* sp. parasites were analyzed and presented below:

The duration of lesions at the time of presentation varied between 2 months to 6 years (median 3 months). Fifty patients (75%) had single lesions. More males (n=59) than females (n=6) were affected with ages ranging from 2-61 years (mean age = 32 years). Most affected age group was 25-35 years (n=40), and the majority was military personnel (n=50). Lesions were commonly seen on the extensor surfaces (38/65). Some had lesions on the face (n=30), pinna (n=10) and back of the chest and abdomen (n=8). There were 3 types of lesions observed: single/multiple dry ulcers (n=33, mean duration of lesion = 13.2 months), single, scaling nodules (n=23, mean duration of lesion = 7.9 months) and non-tender, non-itching, erythematous papules of about 2-3 mm size (n=9, mean duration of lesion=4.7 months) with no scratching or pain. Some patients (n=8) had satellite lesions around the main ulcer.

Majority of the patients were from the north-central province (n=34). Others were from eastern (n=20), southern (n=8), western (n=2) and north-western (n=1) provinces. Most of the affected patients (82%) were living and working in close proximity to jungles. All patients had potential reservoir hosts in their environment. 98% of patients were not aware of the existence of such a disease. All patients had little or no knowledge regarding the modes of transmission, likely vectors, reservoir hosts or preventive measures.

- **Folate studies in anaemic and control groups and their diets**

Grantees: Prof. P.A.J. Perera, Prof. R. Sivakanesan, Dr Amali Abeysekera, Faculty of Medicine, Univ. of Peradeniya, Dr W.R. Wimalasiri, Faculty of Dental Sciences, Univ. of Peradeniya. (Sida/99/BT/02)

The study focused on to find out the incidence of folate deficiency among a group of anaemic patients, to find out whether there is a significant relationship between poor culinary practices and food habits and folate deficiency, to determine the folate levels in some common Sri Lankan foods and to identify foods and culinary practices that give maximal dietary folate. The study concluded that,

- Marmite, bean sprouts and liver were the very high folate contributors, while egg yolk, green leaves and red cowpea were also good sources.
- It's best to consume foods as fresh as possible.
- Young green leaves had a higher folate content than mature leaves.
- Triplosa is a good source of folate.
- When preparing green leaves, it's always better to eat the fresh sambol than heating the green leaves. If heating is adopted, add lime before heating.
- The range for serum folate in a group of healthy Sri Lankans was 3.5 – 22 ng/ml.
- In the anaemic subjects studied, the number of macrocytic blood pictures was higher than the microcytic ones. The incidence of folate deficiency is 74% in the group of anaemics studies. This is much higher than the incidence of vitamin B12 deficiency which was 6.5%. None of the controls was folate deficient.
- 75.7% of the folate-deficient anaemics, had poor dietary habits and practices, which may have led to destruction of folate in the food.

(These findings will be disseminated to the health workers and general public through the programmes of the Science Popularization Committee of the NSF)

- **Antioxidative and hepatoprotective effects of some Sri Lankan medicinal plants in chemically induced hepatotoxicity in mice**

Grantees: Prof. Chithra Pathirana, Dr K.A.P.W. Jayatilaka, Department of Biochemistry, Faculty of Medicine, University of Ruhuna. (RG/2001/M/10)

During the last two decades, due to a variety of reasons there has been a remarkable increase in the interest in herbal remedies. As a result global trends in medicinal plant research are also changing.

Since the scientific information regarding the efficacy of many of the plants with reputed antihepatotoxic activity is far from adequate, it was decided to carry out the present study of some plants used for antihepatotoxic activity.

It was found that both CCI and paracetamol produced liver damage as manifested by the significant rise ($p < 0.001$, Student's t-test) in serum enzyme levels of ALT, AST and ALP and a reduction ($p < 0.001$) in the liver reduced glutathione level (GSH) compared with respective control values.

The elevated levels of biochemical parameters declined significantly in all plant extract treated groups. Pre-treatment showed a faster recovery in almost in all plant extracts than the post-treatment. Administration of the plant extract alone didn't show any significant changes in enzyme levels and liver evidence for the results obtained from biochemical analysis. Out of the five plant extracts, three plants selected. *Asteracantha*, *Asparagus* and *Vetiveria* were evaluated for their antioxidative effect in detail. They also provided supportive evidence for the preliminary results.

The overall results of the study indicate that, under the present experimental conditions all the plant extracts used in the study possess hepatoprotective effects and their activity can be due to the antioxidative properties found, although the extent of protection vary among different plant extracts.

- **Investigation of a Novel Method Based on Photogenerated Singlet Oxygen for Control of Dengue Mosquito Larvae & Environmental Pollution Abatement**

Grantees: Anura Wickramasinghe, Veranja Karunaratne and Gamini Rajapakse, Dept. of Chemistry, Univ. of Peradeniya. (RG/99/C/1)

The main objective of the study were ;

1. To investigate the photodynamic action of several porphyrin derivatives such as haematoporphyrin (HP), haematoporphyrin dihydrochloride (HPD), haematoporphyrin dimethylester (HPDME) and protoporphyrin dimethylester (PPDME) against 4th instar larvae of *Aedes aegypti* under laboratory and natural conditions.
2. To investigate the utility of HPDHC and PPDME for the photosensitized oxidative degradation of coloured organic compounds in oxygenated aqueous solutions.

Photodynamic effect of various porphyrin derivatives under laboratory and field conditions demonstrated that this technology could be effectively used in the control of the larvae of the vector of dengue fever, *Aedes aegypti*. Haematoporphyrin (HP) and haematoporphyrin dihydrochloride (HPD) turned out to be the best photosensitisers against the larvae of *A. aegypti*. HP at 2.5 ppm, in clear plastic containers showed the highest phototoxic effect against the 4th instar larvae of *A. aegypti* in laboratory experiments and in contrast, the mortality under natural conditions was less in tires, coconut shells, tin caps and PVC gutters.

Based on field experiments and toxicity studies, both HP and HPDHC could be used effectively and safely to hasten the larval killing process, thus controlling the adult mosquito population.

In pollution abatement studies, it was demonstrated that porphyrin derivatives such as Haematoporphyrin dimethyl ester (HPDHC) and Protoporphyrin dimethyl ester (PPDME), in the presence of visible light and oxygen could be utilized for the destruction of coloured organic dyes in aqueous media.

The visible light irradiation of oxygenated aqueous solutions of coloured dyes magenta (MaG), crystal violet (CrV) and hemafoxylin (model compound for phenolic pollutants) in the presence of HPDHC or PPDME showed complete colour bleaching after 12 hours. The rate of photobleaching was found to be sensitive to medium pH. At low pH (pH=3,2) a higher rate was observed in comparison to the rate of pH 6.0.

- **Investigation of some physiological parameters and nitrogen utilization of sugarcane varieties SL 8306, SL 7130, and CO 775 under different nitrogen regimes**

Grantee: Dr. (Ms) D.C. Bandara, Faculty of Agriculture, Univ. of Peradeniya (RG/98/AG/ 03)

The physiological basis of the cultivar differences in nutrient requirement of sugarcane has not been clearly defined under the Sri Lankan conditions. Nitrogen is regarded as the most influential element in sugarcane growth, development and yield.

Therefore, a study was conducted with an overall objective of critically comparing two sugarcane varieties with superior yield, disease and pest resistant qualities with traditional variety on a physiological basis as affected by irrigation and nitrogen application.

According to the study, application of nitrogen fertilizer at the rate of 100 kg/ha is recommended for sugarcane cultivations under the low country dry zone conditions. In order to make overall fertilizer recommendations the grantee has suggested carrying out further studies on fertilizer applications including the effects of the other nutrients too. Sugarcane variety SL 8306 was identified as the best variety among the three varieties tested and recommended for low country dry zone of Sri Lanka.

(These findings will be communicated to the relevant institutions)

- **Development of electroanalytical and chromatographic methodologies for the detection of selected pesticides used in Sri Lanka**

Grantees : Dr. N. Priyantha, Dr. A. Navaratna, Dr. D. Jayawickrema
Dept. of Chemistry, Univ. of Peradeniya (RG/99/C/06)

Pesticide pollution has become a threatening problem to the environment. Detection of pesticides by reliable means is therefore an important step in pollution control. The overall objective of this project was to develop analytical methods for the detection of commonly used pesticides in Sri Lanka, to use such methods to investigate the fate of pesticides in the environment and to study the reactivity of them under simulated environmental conditions. In this study, development of electroanalytical, and chromatographic methods were attempted with emphasis on the use of electrochemical methods for mechanistic studies.

The results of the project, through an amperometric method revealed that Thiram, a dithiocarbamate fungicide, was electroactive on glassy carbon electrodes in aqueous medium. This method was applied to quantify Thiram in water leached through a model soil bed and an agricultural beans seed sample.

Use of cyclic voltammetry for quantification of copper present in tea leaves was also accomplished during this project.

The amperometric method developed for the detection of thiram at bare glassy carbon electrodes can be used as a low-cost routine analytical tool for environmental samples that are suspected to be polluted by thiram. Although bare glassy carbon electrodes were used to investigate the activity of pesticides such as thiram, propanil and copper oxychloride, only a few pesticides, out of many tested were found active at bare electrodes. If a substance is not active under normal conditions, a heterogeneous catalyst, in the form of a thin layer deposited on the surface of bare electrodes, should be incorporated for possible detection of the substance.

In this connection, glassy carbon electrodes coated with the metalloporphyrin, Fe(III)TPPCI 5,10,15,20-tetraphenylporphyrinato iron (III) have shown promise in the field of pesticide analysis. Au and Pt electrodes coated with the Fe(III) TPPCI catalyst were shown to be more sensitive detection probes for the determination of

organochlorine pesticides, as compared to glassy carbon electrodes, modified in the same fashion.

- **Developing an effective treatment system for the skim water that is discharged when latex is centrifuged and also to use the biogas generated in the process of treatment as an energy source**

Grantee- Dr. W.M.G. Seneviratna, RRI, Ratmalana (RG/98/EP/01)

The study focused on;

- * to develop a cost effective treatment system for the skim serum/effluent by using mainly biological processes which are environmental friendly
- * to find out a suitable methods to anaerobic bio – gas by skim serum effluent
- * to use bio – gas emitted from the anaerobic treatment plant as a fuel for drying rubber and other related purposes.

In this study, six factories which use centrifuged latex for their products were selected to analyse their effluent quality parameters and other important details.

It was revealed that;

- * Skim serum contain very high organic loads as well as higher per cent of sulphates when compared with crepe rubber effluents. Therefore, microbiological treatment process used to treat crepe rubber effluents should be altered for effluents generating from skim rubber processing.
- * Optimum flow rate of the sulfate rich skim serum into the anaerobic digester should be adjusted to have 5 day retention in the digester compared to crepe rubber effluents from 3 days retention.
- * COD (Chemical Oxygen Demand) removal efficiency is comparatively low at lower pH values. This was quite apparent with skim rubber effluents where serum has higher content of SO_4^{2-}
- * Highest removal efficiency of sulphate rich effluent obtained at loading rate of 4 kg COD/m reactor volume / day and sulphate less effluent could be obtained at a loading rate of 6 kg/m reactor volume/day.
- * Low sulphate skim effluent could be treated more effectively using high rate anaerobic digester.
- * Gas generation increased with COD loading rate of the anaerobic digester. Sulphate less skim serum produced higher amount of gas volume when compared with sulphate rich skim serum

- **Determination of iodine in raw foods and it's fate during cooking**

Grantee : Dr S. Draniyagala, Dept of Chemistry, University of Sri Jayawardenapura
(RG/95/C/02)

Iodine is needed for the synthesis of thyroid hormones, which are necessary to mental and physical health of both humans and animals. It cannot be synthesized in the human body and therefore should be provided in the daily diet.

Data available on iodine content in various foods found in Sri Lanka are negligible and in fact food tables used in Sri Lanka does not list iodine. As a remedial measure, the task of determining iodine in raw foods, and it's fate during boiling was undertaken in this study.

The results of this study show that

1. Prawns can be considered as a good source of iodine when taken as a whole.
2. Marine crab flesh is richer in iodine than prawns and lagoon crabs. Extremely high content of iodine in crabs is concentrated in the gills.
3. Marine fish are richer in iodine than fresh water fish. Both types of fish loses iodine on boiling.
4. Cereals and pulses are poor sources of iodide. *Phaseolus aureus* (Mung bean/Green gram) however is very rich in iodine.
5. Fruits and vegetables are also poor sources of iodine. Among the spices, however, higher levels are found in *Cumminum cyminum* (cumin), *Murraya koenigii* (curry leaves) and *Foeniculum vulgare* (maduru). Among the fruits, highest level of iodine was found in *Annona squamosa*.
6. Coconut/king coconut water is a rich source of iodine. The iodine content of king coconut water fluctuates with maturity.
7. Meats, Milk Powder and Yams have significant levels of iodine.

(These findings will be disseminated to the health workers and general public through the programmes of the Science Popularization Committee of the NSF)

- **A hospital based study of Japanese encephalitis and Dengue fever and a comparison of diagnostic techniques**

Grantee: Prof. Lalitha Mendis, Faculty of Medicine, Univ. of Colombo (RG/ 2001/M/04)

A hospital based study during 1998-2000 at the North Colombo Teaching Hospital, Ragama, to determine the relative morbidity caused by Japanese encephalitis (JE) and dengue during the study period; the proportion of primary and secondary dengue infections in patients diagnosed as having dengue infection; the proportion of viral encephalitis cases caused by JE virus; and to compare the usefulness of the Armed Forces Research Institute of Medical Sciences reference enzyme-linked immunosorbent assay (AFRIMS ELISA), and PanBio Dengue Duo IgM and IgG. Rapid Strip test (PanBio Strip test) in the diagnosis of dengue infections is reported. A preliminary study to assess the usefulness of reverse transcriptase polymerase chain reaction (RT-PCR) as a routine diagnostic test in diagnosing dengue infections is also reported.

- **Interpretation of gravity anomalies over the Indian ocean region around Sri Lanka**

Grantee: Prof. D.A. Tanthrigoda, University of Sri Jayewardenapura (RG/2000/P/03)

Satellite gravity and bathymetry information covering the region 65°E -95°E, 10°N - 10°S (≈2x500 000 data points) of the Indian Ocean around Sri Lanka have been downloaded from the NOAA (<http://topex.used.edu>) Geological database. Gravity anomalies have been interpreted to estimate the sediment thickness and other features of the shallow subsurface structure of the region using well-established techniques in Geophysics. A new method of extracting the gravity anomaly caused by the sediments deposited on folded oceanic crust from the observed anomalies, which involves frequency domain manipulations has also been formulated. Most of the computer software needed for the interpretation has been developed as a part of the project. Downward migration of the oceanic crust due to the pressure exerted by nine prominent seamounts in the region has also been calculated considering the oceanic crust as a viscoelastic plate lying over an incompressible fluid half space and compared with the results of the gravity interpretations.

Results of the study show that the foot of the continental slope of Sri Lanka is situated approximately at an average distance of 68 km (≈23 nautical miles) from the shelf line and the thickness of sediments deposited beyond the foot of the slope varies from little over 2 km to almost 0.8 km approximately over a distance of 170 km. Downward migration of the oceanic crust below the

two main members of the Afanasy-Nikiten chain of seamounts have been calculated interpreting gravity anomalies and found to have maximum depression of 5.5 km and 3.0 km. A similar study carried out over seven other smaller seamounts scattered over the central Indian Ocean shows that the maximum depression of the oceanic crust due to their pressure varies from 4.0 km to 1.0 km. Several profiles of gravity anomalies below 6° S of the equator covering the region 79°E-87° E, 2°S-8°E have been interpreted and results were used to compile a isopach map. This map shows that the thickness of sediments goes down towards the middle part of the region to about 0.6 km and increases to 0.8 km at the periphery and gain decreases towards the south.

- **Induction of oral cancers and precancerous lesions using areca extract in mice: Development of an animal model to study oral cancers and precancerous lesions and to evaluate their therapeutic management**

Grantee: Dr Kumara Kaluarachchi, Faculty of Medicine, University of Peradeniya (RG/2002/M/04)

Incidence of oral precancerous lesions and oral cancer are highest in the South Asian region, which is attributed to the habit of betel chewing. Areca or betel nut is an essential ingredient in the betel quid. The objective of this study was to develop an animal model (mouse) in investigating the oral precancerous lesions in causing the oral precancerous lesions and oral cancers, and in determining the role of areca in causing the oral precancerous lesions and oral cancers. Thus, it may provide an opportunity to assess the relatively harmful and beneficiary effects of the individual components of Sri Lankan betel quid and to find novel approach for therapeutic management of the disease.

The results showed that the areca could induce thinning of the oral mucous membranes and apoptosis, it is interesting to pursue more investigations in that direction. It is required to explore into the biochemical processes involved in apoptosis caused by areca nut consumption at the very initial stages of potentially malignant conditions.

- **A study of the distribution patterns of algae on the Southern coast of Sri Lanka with special reference to anthropogenic effects**

Grantee: Prof. M.P. de Silva, Dept. of Botany, Univ. of Ruhuna (RG/99/B/08)

The marine algae are one of the important components among the primary producers in the ocean. They are abundant in the littoral region of the seashore as well as in the sunlit sublittoral regions.

The diversity and abundance of many algae showed marked variations during the course of the year indicating the influence among others of the monsoonal changes of ocean characteristics on the reef flora. The monsoons, which come hard on the coastline from during May to September, play an important role in the algal vegetation of the southwest coast of Sri Lanka. The reefs present a different picture during the two different monsoons. Thus algal vegetation along these sites exhibit seasonal variations based on monsoonal effect. Considering the total extent of the coastline of Sri Lanka which is 1585 km. this study was able to record nearly 28% of the total records within a coastline length of less than 2% of the total. It is therefore justifiable to state that many new species remain to be discovered if the study can be extended further to the remaining coastline.

- **Eco physiological studies on the invasive behavior of *Cuscuta spp*, in Sri Lanka and their impact on host plants**

Grantee: Dr D.S.A. Wijesundera, Univ. of Peradeniya (RG/99/B/09)

Invasive behavior of *Cuscuta* species in Sri Lanka was studied. The study included current distribution, host range, taxonomy, anatomy of host parasitic association and phonological comparison of *Cuscuta* in five agro-ecological zones.

It was observed that *Cuscuta* is highly distributed in the dry areas such as Anuradhapura, Polonnatuwa and Hambantota. However, it was also found in the low country wet zone. In the dry zone it was found frequently along the bank of irrigation canals, agricultural lands and road side vegetations. In the coastal areas *Cuscuta* was distributed mostly along the railway track, roadsides and wastelands. 170 host plants including rice were observed. Host range of lowland *Cuscuta* consists with among host 59 families and 139 genera. *Mikania cordata* and *Wedelia trilobata* appears to be the primary hosts to the lowland *Cuscuta*.

Upcountry *Cuscuta* (*C.reflexa*) is not a problem to the crops. However, it is found growing on 18 species in the montane forests. The lowland *Cuscuta* species is not similar to *Cuscuta chinensis* as previously reported. The taxonomic characters of that species are similar to the noxious weed *Cuscuta campestris*.

The mature *Cuscuta* seeds contained higher amounts of fat, protein and starch than those of immature seeds independent life duration decreases with stored time probably due to the reduction of stored materials with time.

Cuscuta can be successfully propagated by vegetative means. Also when *Cuscuta* is propagated vegetatively the life cycle synchronizes with its mother plant.

Phenology of *Cuscuta* in five different agricultural zones such as Wet zone Mid-country 3(WM 3), Dry zone Low country 1(DL 1), Wet zone Low country 4(WL 4), Intermediate Mid country 1(IL 1) were compared. No difference in *Cuscuta* species was found in different zones. But due to the different environmental conditions prevailing in different agro ecological zones, some of the morphological and phonological characters can show a certain degree of variability.

As *Cuscuta* is having a wide host range it can survive on weeds growing in the vicinity when the crop is not present. Therefore, the sanitation in the agricultural fields is very important as a preventive measure. The best method to control the spread of this species is by identifying the affected host plants and irradiating them. It is also important to make the relevant people (farmers, industrialists.etc) aware about this parasite and its controlling methods.

• **Comparative study on the technology introduced by ITI for distillation of leaf oils versus the traditional and to find the possibilities of reducing the cost**

Grantee: Ms N.T. Amarasinghe, ITI, (RG/2000/E/02)

The ITI has been involved in the distillation techniques and the analysis of essential oils. Therefore, expertise and analytical instruments (GC) already available in the Institute were used for the project. The maximum oils available in the raw material was found by the standard laboratory distillation with specially made Dean and Stark apparatus.

Almost 50% of the production of leaf oils is spent on harvesting. Cinnamon is harvested mainly to get the bark which has a higher value and harvesting cost may not be included in the leaf oil cost. But in citronella, oil is the only product and harvesting cost is considerable. Therefore, possibility of using Bush cutter for harvesting citronella was studied.

Project could quantify the increase in oil yield and quantity by the application of new technology without any changes to the condition of raw material. Further, an improvement in productivity by using chopped cinnamon twigs is a new introduction to leaf oil distillation and have applied for patent rights.

Effect of loading the material with steam assistance was studied in detail and when cost benefit analysis was done, it was noticed that it is impossible to recover the cost without steaming in the Traditional Distillation Plant. It was possible to obtain leaf oil with .80% eugenol using leaves alone (normal requirement is 75%) which is above the normal range. This oil could have a special market for higher value.

Supplied machinery for 1 Tonne capacity lemon grass oil distillation plant adopting New Technology. The plant was commissioned in April 2004 with more confidence and achieved expected output. Bush Cutter available in the market can be used economically and recommended for harvesting Citronella.

- **Developing a biocontrol method to increase shelf life of 'Embul' bananas**

Grantee: Mrs A. Karunaratne, Univ. of Peradeniya (RG/99/B/06)

Two common pathogens associated with crown rot in the Asian region, *Collectotrichum musae* and *Botryodiplodia theobromae* on 'Embul' bananas were assessed for their relative ability to cause disease. The combined effect of both pathogens was always less than their individual effects. The results showed that *B.theobromae* is relatively more robust in spreading within banana tissues, and there does not appear to be a synergistic effect between *Colletotrichum musae* and *Botryodiplodia theobromae*.

Two bacteria (*Flavobacterium sp.* and *Pantoea agglomerans*) on two pathogens associated with banana crown rot, were tested on 'Embul' bananas, to determine their effectiveness as an alternative to use of fungicides and to determine their mode of antagonism. None of the biocontrol applications were as effective as the fungicide, thiabendazole. On banana hands, viable cell preparation of each antagonist reduced crown rot significantly. Antibiotics of *Flavobacterium sp.* appeared to be more potent directly on the pathogens.

Of the two pathogens *B.theobromae* appeared to be more liable to control by both antagonists. Bioformulations of antagonists in sterile distilled water and in spent culture medium were found to be significantly effective in suppressing crown rot lesion development. *P.agglomerans* in sterile distilled water was able to control the disease almost by 50%. The results showed that there is a chance to develop an environmentally friendly effective control method for crown rot development using these antagonistic bacteria.

- **Performance of selected forest species providing non-timber forest products in Sinharaja World Heritage Site**

Grantee: Prof. C.V.S. Gunatillake, Univ. of Peradeniya (RG/MAB/2000/01)

The overall aim of the above study was:

- (1) To investigate the growth performance of selected Non-timber Forest (NTF) species in an enrichment trail in the *Pinus caribaea* buffer zone of the Sinharaja MAB reserve.
- (2) To examine the regeneration of these study species and their population sizes in different parts of the forest fringe or in disturbed forest, to understand their response to disturbance.

The silvicultural, biological, ecological and physiological information gathered on each species under the above study would be useful to identify and recommend the optimal growing conditions that should be given for each species in reforestation and enrichment planting programmes in the buffer zones of protected areas throughout the lowland wet zone of Sri Lanka. Enriching the buffer zones with NTF species will certainly provide multiple benefits to local communities, while serving its buffer zone functions.

- **Development of an oil fired kiln for the manufacture of high quality dolomitic lime as an alternative for coral based lime**

Grantee: Dr M.G.M.U. Ismail, ITI (RG/2000/NR/01)

Mining of limestone from coastal reef has caused serious sea erosion and other environmental problems. On the other hand, dolomite, calcium and magnesium carbonate ($C_aCO_3MgCO_3$) is the only alternative mineral available to produce lime. The quality of the dolomitic quicklime available in the market is inferior due to the presence of unburnt and over burnt particles. Hard burnt Magnesium oxide is difficult to hydrolyze and result blistering of the plaster.

In addition, supply of firewood as a heat source becomes more difficult and this is a threat to the environment. Exhaust gases from wood fired kiln causes health problems for the workforce involved in this industry.

An oil-fired kiln designed and constructed at Digana to solve problems mentioned above. High quality dolomitic lime can be obtained by controlled firing in the calcine zone. High productivity in the kiln can cater the high demand for lime. Environmental impact is less due to the facts of complete combustion of oil.

The experiments concluded that by subjecting the lime to pressure and high temperature, it is possible to obtain complete hydration for MgO. Steam hydrated plant was setup at Digana to produce high quality dolomitic hydrated lime powder. This is the most concentrated form of hydrated dry, fine, white powder that can be produced commercially as hydrated lime.

Although the cost of production of dolomite quicklime using oil-fired kiln is higher compared to the traditional kiln, high quality quicklime can be produced compared to the traditional kiln, the new product is superior, as the plaster made using this product does not crack. This means that a value has to be added for that. Also, the method has less impact on the environment, which again means that a value has to be added for that too. Hence, with proper marketing strategy, this product could be sold easily even at a higher price.

- **Protective measures for the current latex protein allergy problem –
A solution to a serious threat to Natural Rubber Industry**

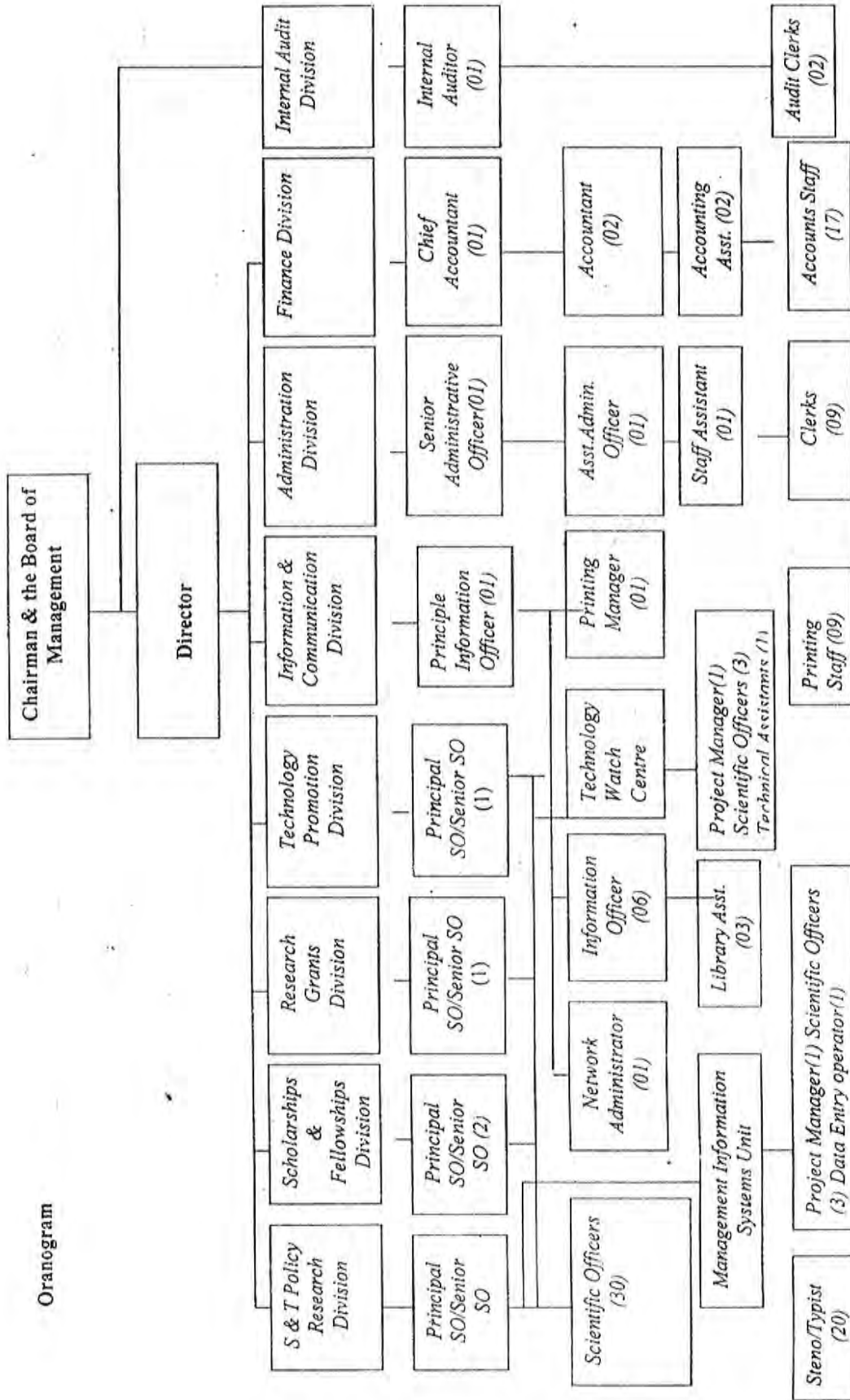
Grantee: Dr G. Seneviratne, RRI (RG/99/C/07)

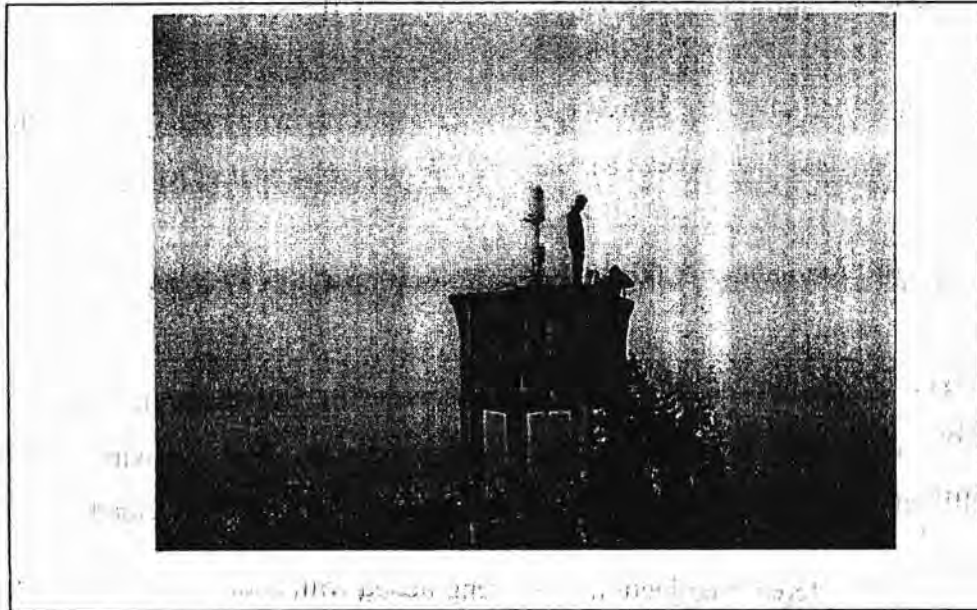
Sri Lanka is one of the leading NR latex based examination and surgical gloves manufacturers in the world. Over 20% of the total NR latex produced in the country is converted into gloves annually, where the value addition is over 300%.

However due to the increasing concern over the protein allergy problem causing health hazards to end-users, the demand for pure NR latex based gloves and hence the price paid for this value added commodity is declining fast. In order to eliminate the problem, actions have been taken by the Rubber Research Institute to identify remedial measures both at the latex centrifuging stage and at the end product manufacturing stage to lower the extractable protein (EP) levels to the levels demanded by FDA in USA and in European countries.

From the results it was understood that the EP levels in all popular clones planted in Sri Lanka are in the same range. By leaching in water and by chlorine washing they can be reduced to below 50 ppm demanded by the consumers in Europe and USA.

Organogram





Research out come of the project "Implementation of an Automated Lightning Detection Network for Sri Lanka" received a certificate of commendation under the NSF merit awards for research. The picture shows the installation of Detection station at Weligatta, Hambantota



"World Science Day" Programme- Drama depicting "Igilenna Hithak" (Desire to Fly)

SERVICES

Workshops/seminars/conferences organized by the NSF

NSF has organized 18 workshops, 3 progress review seminars, and 6 seminars for stakeholders during the year. The details are given in Annex 02.

Sri Lanka Science & Technical Information Centre (SLSTIC)

SLSTIC continued to be the focal point for the dissemination of S & T information in Sri Lanka during the year under review. The following tasks were fulfilled to enhance the information collection & the services provided.

□ *Collection Development*

The central reference collection was strengthened with addition of both printed & electronic reference sources. A large number of useful S & T related web sites were linked to enhance the 'Global Information Gateway' provided through the NSF web site. The number of books, reports and NSF grant reports added to the collection were 82, 47 & 39 respectively.

□ *Improvement to existing databases*

- Facilities for on-line interaction among users for easy & quick exchange of material were provided for all databases.
- An on-line consortium for printed journals received by SLSTINET libraries during year 2004 was established providing access to the relevant web site of each periodical.
- Gaps of the Sri Lanka Science Index (SLSI) database identified for the period 2000-2004 were filled. The number of new records added was 4806.

- Based on a survey the Union List Periodical Holdings in S & T libraries database was updated. New records added was 1759
- 1467 number of records were added to nLSTIC catalogue
- Information covering the abstracts of the final reports of 39 research grants were added to the Research Grants Database collection. Data in the complete database were edited & rectified & database streamlined to facilitate data analysis.
- Based on a survey information the SLSTINET Libraries Directory database was completely updated.

□ ***Enhancing the use of Information Technology in S & T libraries***

- SLSTIC continued to National Distributor of UNESCO developed CDS/ISIS software (windows version). 28 copies of the software was distributed to public & private sector organizations.

□ ***Local Area Network***

The 2 network servers were replaced with new ones for better performance. With the addition of three new sites the total number of web sites hosted in the NSF server recorded 15.

□ ***Services provided by SLSTIC***

275 users have visited the SLSTIC during 2004 for reference, database searching & Internet searching. Facilities to search, view & download research papers (full text) from full text databases provided under the INASP/PERI (*International*

Network for the Availability of Scientific Publications/Programme for the Enhancement of Research Information) programme was also provided. Total number of searches done for users was 333. A document delivery service was also provided including services offered through the British Library Document Lending services for documents not available locally.

□ **Library Networks**

SLSTIC actively contributed to the following networks during the year.

HELLIS – Health Literature & Library Information Services

AGRINET – Agricultural Information Network

PUBLICATIONS BY NSF

Journals

The following journal volumes were published

SLJSS - Sri Lanka Journal of Social Sciences Vol.25 (No 1 & 2)
and Vol 26 (No. 1&2) 2002 and 2003 issues



Journal of National Science Foundation

Vol 31 Nos (3&4)

Vol. 32 (Nos. 1 & 2)

Newsletters



The NSF newsletter "Vidya" was published quarterly.

Volume 6, No. 1 - January, 2004

Volume 6, No. 2 - April, 2004

Volume 6, No. 3 - July, 2004

Volume 6, No. 4 - October 2004

Techwatch Lanka

Three issues of the TWC newsletter, "Techwatch Lanka" has been disseminated to the industry, local R&D institutes, chambers, associations, libraries and relevant authorities.

Magazines

Vidurawa -Vol 20 (No 2) - "Mosquito Borne Diseases (Tamil version)

Reports

The following reports were completed

- Booklet on organic shrimp farming.
- Booklet on “Noise Pollution and Control Techniques”
- Book on “Identification of some Selected Aquatic Ornamental Plants of Sri Lanka” for the aquatic ornamental plant export industry.
- Booklet on “Making a quality loaf of bread” as a follow up activity of the workshop for the “bakery industry”. The Sinhala translation of the same has been done fulfilling a request made by some entrepreneurs in the bakery industry.
- Recommendations for the NSF- Based on the study on “Role of public policy in promoting relationships among universities, research institutes and industry in Sri Lanka”
- A report on “Towards promoting the development of biotechnology industries in Sri Lanka” prepared by the Special Committee on Biotechnology was presented to the Hon. Minister Prof. Tissa Vitarana during his visit to the NSF on 20 May 2004.
- Paper titled “Trends and shifts in Institutional Productivity with special reference to Natural Products Chemistry in Sri Lanka” accepted for publication in the December 2004 issue of the “Research Evaluation”.
Geethika Yapa, M.A.T. de Silva, E. Dilip de Silva.

INTERNATIONAL SCIENTIFIC ACTIVITIES

Sida

Sida has provided SEK 750,000/- to fund Sida/NSF research Grants Scheme, International Contacts and R&D policy & S&T indicators project.

ICGEB

The NSF continued to be a member of ICGEB upon payment of the annual subscription of Rs 527,650/-. Six applications were endorsed and forwarded to the ICGEB for consideration under the pre-doctoral fellowship programme 2004. Dr Dias, Head of Technology Promotion Division attended the Liaison Officer's meeting of the ICGEB held from 4-6 June 2004 in Trieste, Italy representing Sri Lanka. The main discussions of this meeting were on the training programme organized by the ICGEB such as PHD Programme, Post-doctoral fellowships and Short term training programmes, etc. Also, improvements on the administration of above programmes, new suggestions on sandwich programmes, mechanisms to stimulate persons who have completed post-doctoral fellowships, requirement of having separate travel funds for short term training programmes, etc., had been proposed.

- Two post doctoral fellowships were awarded to the following Candidates:
Dr G.P.G. Menaka D. Hapugoda, Univ. of Kelaniya
Dr W.T.A. Wickramarachchi, Univ. of Colombo
- One Pre-doctoral fellowships was awarded to the following Candidate:
Ms. K. Vivehananthan, Dept. of Biotechnology, Wayamba
University

- The information on the following programmes were widely circulated among the universities and research institutions
 - Short-term Training Programme - 2005
 - Fellowship Programme - 2005
 - Collaborative Research Programme (CRP) – 2005

Two research scientists attended short-term training programmes held at the ICGEB Trieste and New Delhi and affiliated centres.

AASSREC

NSF Continued to function as the National Focal Point for the AASSREC.

Indo-Sri Lanka S & T Cooperation

The NSF took initiative to coordinate research activities under broad subject areas (apart from Biotechnology) from 2004 as per the MOU signed by the two governments in October 1998. The subject areas are as follows:

- Biotechnology
- Electronics and Telecommunication
- Information Technology (including Software Development),
- Earth & Atmospheric Sciences
- Accreditation and Standardization
- Renewable Energy
- Natural Disaster Management
- Ocean Development
- Space Technology and Applications
- Fisheries and Agriculture
- Any other areas of mutual interest

Out of the 28 concept proposals (in the above areas) short-listed by the Indian Government 11 proposals were revised and updated and submitted to the Ministry of Science & Technology.

SAARC

Comments on the report of the first meeting of the Working Group on Biotechnology were communicated to the Ministries of Science & Technology and Foreign Affairs.

Two nominations were forwarded to the Ministry of Foreign Affairs for the SAARC symposium on Natural Product Chemistry to be held in Peshawar, Pakistan.

- Prof. V. Karunaratne, Univ. of Peradeniya
- Prof. H.R.W. Dharmaratne, IFS

International Project Office of the LOICZ

A Regional Node of the International Project Office of the LOICZ (Land Ocean Interactions in the Coastal Zone) for South Asia was established at the NSF and a National Committee on LOICZ has been formed.

Visiting Foreign Delegates

Dr(Ms) Bertil Wahlund, Research Advisor of SAREC/Sida and Mr Goran Schill of Swedish Embassy in Sri Lanka visited the NSF on 26th Oct to discuss the matters related to the Sida projects.

Dr Ramanathan of the University of Western Sydney(UWS), Australia, visited the NSF on 17th Mar with a view to formulate a joint programme between NSF and UWS

AWARDS

NSF Merit Awards

NSF Special Merit Award winners for 2003 were Prof. Veranja Karunaratne, Prof. N.K.B. Adikaram and Dr Karunananda Bombuwela for the research done on "Bio active natural products from Sri Lankan lichens culturing of micobiont in the laboratory".

Winners of the Certificates of commendation were Dr Maya B. Gunasekera, Dr Neil D. Fernandopulle, Dr Nalin C.W. Goonasekera, for the research done on "Development of DNA markers of the Sri Lankan population for human identification"; Dr S.B.A. Athauda, Mr H.G.U.P. Jayaratne for the research done on "Isolation, purification and characterization of clinically important proteinases of filarial parasites"; Dr D.U.J. Sonnadara, Prof. T.R. Ariyaratne, Mr A.B. Weerasekera, for the research done on "Implementation of an automated lightning detection network for Sri Lanka" and Dr Maya B. Gunasekera, Prof. W.D. Ratnasooriya and Dr Yasantha Mapatuna for the research done on "Molecular systematic of *Cynopterus* species complex".

The award ceremony was held on 30th September 2004 at the NSF Auditorium.



The Merit Award being presented by the Minister

SPECIAL ACTIVITIES

UNESCO Activities:

- ***Evaluation of Expressions of Interest in relation to research on the MAB Programme***

The MAB programme is concerned with developing the basis, within the natural and social sciences, for the sustainable use and conservation of biological diversity, and for the improvement of the relationship between people and their environment globally.

The MAB Committee called for expressions of interest in carrying out research work related to the National MAB Programme.

Areas of interest, in respect of which responses were sought, included the following:

- Research that would help in the preparation of biodiversity profiles for the national and international biosphere reserves in Sri Lanka
- Research on the ecology and survival of threatened/endemic species, with particular reference to the national and international biosphere reserves and other similar ecosystems
- Development and/or education and communication activities that are in line with the MAB objectives

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

A Nomination form for the Bundala National Park as an International Biosphere Reserve was submitted to UNESCO. The Department of Wildlife Conservation undertook this study with assistance from the NSF, other relevant governmental, nongovernmental authorities and the local communities with financial assistance from UNESCO.

The study group comprised the following.

- Mr H.D. Ratnayake - Principal Investigator, Dept of Wildlife, Member of the National Man and the Biosphere Committee
- Mrs Anouk Ilangakoon-Environmental Scientist
- Mr Y.G.P. Karunaratna -Park Warden, Dept of the Wildlife
- Mr S.R.B. Dissanayake -Ecologist, Dept of the Wildlife
- Dr Channa Bambaradeniya - IUCN / Member of the National Man and the Biosphere Committee
- Mrs Anusha Amarasinghe- NSF,Coordinator & Secretary National Man & the Biosphere Programme

□ ***Review of the Sinharaja Biosphere Reserve***

UNESCO accepted the Review of the Sinharaja Biosphere Reserve submitted on the recommendation of the National Man and the Biosphere Committee. This was done in collaboration with the Department of Forests and other relevant authorities with financial support from UNESCO.

□ ***Web Site for Biosphere Reserves in Sri Lanka***

On the recommendation of the National Man and the Biosphere Committee, a concept paper for a web site for Biosphere Reserves was submitted to UNESCO India and NSF for possible funding.

Total funds requested was USD 4200/- from UNESCO, India and Rs 140700/- from NSF. UNESCO India has earmarked \$4200 for 2005 for the web site.

□ ***Nomination of Peak Wilderness Central Highlands of Sri Lanka***

The Man and Biosphere (MAB) National Committee, on which the Forest Department, the Department of Wildlife Conservation and the UNESCO National Commission are represented, has recommended that Peak Wilderness Sanctuary and the neighbouring forest areas be nominated for listing as a World Heritage Site under the Convention concerning the protection of the World cultural and natural heritage.

A Sub Committee was appointed to prepare a request for preparatory funds, for a study of the Peak Wilderness and adjacent forests for the nomination.

□ ***Approval of the KDN Forest complex as an International Biosphere reserve***

The Bureau of the International Coordinating Council approved the site of the Kanneliya- Dediya-gala- Nakiyadeniya (KDN) as a Biosphere Reserve. The World Network of Biosphere reserves consisted of 459 Biosphere Reserves with this addition.

□ ***Representation of the National MAB Committee on the International Coordinating Council***

Sri Lanka has been elected to the International Coordinating Council (ICC) on Man and the Biosphere at 32nd session of the General Conference (2003) of UNESCO and the membership on ICC will remain until 2007. ICC is composed of 34 elected representatives of Member States of UNESCO.

Since Sri Lanka is the member of ICC, Sri Lanka should attend meetings of ICC which meets once every two years in UNESCO Headquarters. The 18th Session of the MAB-ICC was held at UNESCO Headquarters in Paris from 25-29 October 2004. Three matters were highlighted in the Sri Lankan oral submission in particular (a) revision of the criteria for the core zone of biosphere reserves, (b) increasing the eligible age limit from 35 to 40 years for the MAB Awards Scheme and (c) developing a mission statement for the MAB programme.

□ ***Second Meeting of the South and Central MAB Network***

Sri Lanka participated (Prof I.A.U.N. Gunatilleke of Univ. of Peradeniya represented) at the Second South and Central Asian MAB (SACAM) Network Meeting of Experts: Sustainable Eco-tourism in Biosphere Reserves and Similarly Managed Areas.

This meeting was organized by the Iranian National Commission for UNESCO in joint co-operation with the National MAB committee of Iran, Iranian Department of Environment, UNESCO Teheran office and UNESCO New Delhi office. It was held in Zibakenar in northern part of Islamic Republic of Iran near Caspian Sea from 25-28 September 2004.

□ ***Nominations were sent to the following***

- First International Barcode Conference to be held at the Natural History Museum, London from 7-9 February 2005
- L'OREAL Unesco Awards 2005 for women in Condensed Matter Science
- L'OREAL co-sponsored Fellowships for Young Women in Life Sciences- Biology, Biochemistry, Biotechnology and Physiology in UNESCO Member States for 2005
- Inter university course in Biotechnology at the Osaka University

□ **Proposals to UNESCO**

- A proposal was submitted to the UNESCO's Participation Programme to obtain funds amounting to Rs. 913,600/= (US\$9136) for Research Training in the Social Sciences

A proposal was submitted to UNESCO for the establishment of a National Liaison Committee of the Management of Social Transformation (MOST) programme of the UNESCO at the NSF

Biotechnology

Documenting the Technology Roadmap for biotechnology-based industries was completed. The work was initiated with a view to:

- Review the development and progress of biotechnology policies and biotechnology industries and globally, regionally and in Sri Lanka

- Identify the applications in biotechnology that will improve publicise health, enhance the quality of life and contribute to sustainable economic growth in the country.
- Analyse the strengths, weaknesses, and assess the feasibility of applying these technologies to the needs of the country and identify key biotechnology industries that could be developed with government and private sector partnerships.
- Identify a framework for establishment, promotion, sustenance and monitoring of biotechnology industries.

Bioethics

Dr Jens Schlieter, from the Research group on Bioethics, at University of Bonn visited the NSF on February 17, 2004. He was interested in collecting information on the role of Buddhist ethical thought in the decision making process, focussing on questions concerning the beginning of human life, cloning and embryo research respectively.

Dr Schlieter delivered a lecture on “The ethics of Embryo research and human cloning: recent discussions in Europe on March 9, 2004 in the NSF auditorium.

A proposal titled “Development of Bioethics in Sri Lanka” was submitted to UNESCO seeking funding for the activities of the National Bioethics Committee (NBC). The proposal is under consideration.

A recommendation from the NBC outlining the importance of establishing a DNA fingerprinting laboratory at the Government Analyst is Department (GAD) was sent to the GAD.

NSF/SLAAS Science Forum

The NSF has initiated a regular series of monthly public seminars in June 2002, in collaboration with the SLAAS. These public seminars are arranged for scientists who are recipients of travel grants from the NSF to share the knowledge and experience gained from the International Seminars/Conferences/Workshops with the rest of the scientific community who did not obtain the opportunity to attend such events. 8 seminars were held at the NSF and SLAAS and 15 scientists made presentations to share their experience and knowledge at these seminars during the period of March – October 2004.

International Contacts Fund

Sri Lankan scientists are supported by International Contacts Fund of the NSF to attend International Conferences/Seminars/Workshops. Applications for travel grants are considered six times a year. During the year 2004, 119 applications were received and 85 travel grants were approved. Of which, 70.6% grantees were from Universities and rest from other Institutions, 50.6% grantees were below the age of 40 years and 41.2% grantees were females. The total amount disbursed for travel grants was Rs 5,710,000/-

The SPRD and the MIS Unit

The Science & Technology Policy Research Division tentatively established with effect from September 2003 continued to function through out 2004 under which the work relevant to the Management Information System (MIS) Unit was conducted. The MIS Unit was funded by the S&T Personnel Development Project (STPDP) of the Asian Development Bank handled by the Ministry of

Science and Technology until the end of September 2004. The following were the main activities done during the year 2004.

□ *S&T Management Information System (STMIS)*

STMIS is computer based information system for data collection on the S&T man power in Sri Lanka. The Unit collected information from the Universities and R&D institution and entered into the database during the year and the regular updating of the database was also continued.

□ *S&T manpower and related studies*

The research project on “ Tracer study of S&T graduates passed out from the Sri Lankan universities in 2002” was completed. This study provided an insight to the demand for fresh graduates in various R&D disciplines.

□ *Other activities*

The Division received services of Prof Adam Holbrook, Associate Director / Adjunct professor, Centre for Policy Research on Science and Technology, Simon Fraser University, Vancouver, B.C. Canada, who was on a short visit to the NSF as an International consultant to review the STMIS database for the period 21-31 December 2004.

Technology Watch Center – (Estd in 2001)

Main goals of the technology watch centre are:

- Acquire information on available technologies
- Forecast the likely technology to be used in the relevant areas and
- Disseminate the information to the industry/institutions, in order that the industry/ institutions could efficiently and effectively meet the challenges resulting from global technological changes

□ *Technology level assessment*

Surveys carried out;

to assess the technology status of plastic industry and to prepare report on the same.

to collect information on technologies developed by the local universities and made the local industry aware of the availability of these technologies as well as local expertise in the respective fields. (Industry- Institute Technology Transfer Programme and Consultancy Arrangements).

□ Four booklets were published addressing specific technology related problems of the industry

- A booklet on organic shrimp farming.
- A booklet on “Noise Pollution and Control Techniques”.
- A book on “Identification of some Selected Aquatic Ornamental Plants of Sri Lanka”.
- A booklet on “Making a quality loaf of bread” (Sinhala translation of the same has been done fulfilling a request made by some entrepreneurs in the bakery industry)

(Seminars and workshops organized by TWC are given in annexure 2)

Intellectual Property Rights

Two applications based on research findings under NSF research grants were filled for patents.

- | | | |
|-----------------------------|---|-------------|
| 1. Multipurpose mud wheel | : | RG/97/AG/02 |
| 2. PLAG upland penetrometer | : | RG/97/AG/02 |

World Science Day Programme

A programme was organized to celebrate the World Science Day (which falls on November 10th) in collaboration with the Ministry of S&T. About 800 school children and 200 invited guests participated at this ceremony held at the 'Navarangahala', Royal College from 8.30 a.m. to 01.30 p.m.

NEW PROGRAMMES INITIATED

Databases

The NSF library has established the following databases;

Digital Library (using Green Stone Digital Library Software) to accommodate full text of electronic documents. The technical reports and other S&T documents generated by NSF were taken as sources of information.

SLAAS database (papers presented at Sessions of the Sri Lanka Advancement of Science) References to papers read during the period 1997 – 2003 were recorded. The total number of records entered was 1246

NSF Science Page Collection

A complete digital collection of articles appeared under the Science page (supplied by the NSF) in the Newspapers Daily News, Dinamina and Thinakaran was compiled with indexes for easy searching. The collection will be made available for sale on CD-ROM media.

Database of Experts on Forestry

A database was prepared on experts in the field of forestry. The selection criteria: A person who possesses a Master Degree and experience not less than

five (05) years in the field of forestry would be considered as an expert of forestry

Database of publications on forestry

Abstracts of publications on forestry published from 1975 onwards were collected. A Research Assistant was appointed for a period of 04 months. Funds for this activity were provided by the NSF and Techwood Investment (Pvt) Ltd.

Support for Research in Nanotechnology

In February 2004 the NSF organized a seminar on nanotechnology, where the chief speaker was Prof. Ravi Silva Professor of Solid State Electronics and Head of the Large Area Electronics and Nanotechnology Group, University of Surrey, UK.

In his presentation the speaker illustrated the structure and properties of carbon nano-tubes, carbon nano-fibres and composites, and their applications for new materials. Applications in electronics and drug delivery systems were also highlighted.

At this seminar, it was proposed that the NSF should initiate some research work on nanotechnology and the Research Committee on Physics was requested to come up with research proposals and an action plan.

The Research Committee on Physics followed up this matter. They pointed out that to carry out a meaningful research project in this field, the very basic structural characterization instrument, such as Scanning Electron Microscope (SEM) is essential. Nevertheless, they were of the view that it would be appropriate to start some research work on this new field initially at Peradeniya, Colombo and Kelaniya Universities. The Committee felt that attention should be

given to areas like strong materials, energy conversion materials, energy storage materials in the research proposals. Principal researchers have been identified in the three universities.

The Research Committee on Physics suggested that at the initial stage the proposed groups will work with available equipment and facilities at the respective institute and NSF may contribute/give financial assistance in small scale/justifiable amount for the proposed study. Later if the research is progressing well the collaborative groups of the project will request for additional funds, advanced equipment etc. from external sources and further, these projects can be combined under the general theme of nanotechnology.

University of Peradeniya, Kelaniya and Colombo have already submitted the draft proposals under the general heading of nano-materials.

STMIS homepage and website: www.mis.nsf.ac.lk

The STMIS homepage was designed and the database was published online on the 08 November 2004 at an inauguration ceremony held at the NSF with Hon. Prof. Tissa Vitarana, Minister of Science and Technology as the Chief Guest.

Special Committee on Popularization of Science:

The NSF has established a special committee on “Popularization of Science” with a view to;

1. Training of communication skill of scientists, science writers, and media people
2. Establish science centers for the general public
3. Encourage young inventors

MANAGEMENT

Board of Management from 01.01.2004 to 28.04.2004

Prof. Ranjan Ramasamy
Chairman/ National Science Foundation

Mr. M Watson
Director/ National Science Foundation

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

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

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

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

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

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

Board of Management (From 05.07.2004 to 31.12.2004)

Prof. Sirimali Fernando
Chairperson

Mr. M Watson
Director of the Foundation

Prof. Tuley D de Silva
451/75, Thimbirigasyaya Road
Colombo 05.

Prof. S R H Hoole (from 31.08.2004 to 31.12.2004)
Member/University Grants Commission
15/7, Col. T G Jayawardene Mawatha
Colombo 03.

Prof. J N O Fernando (from 08.10.2004 to 31.12.2004)
Sri Lanka Association for the Advancement of Sciences
Vidya Mandiraya
120/10, Vidya Mawatha
Colombo 07.

Prof. H J de Silva
19, Baddegana Road
Pitakotte.

Dr. Janaka Ratnasiri
27, Sudarshana Mawatha
Nawala, Rajagiriya.

Dr. M C N Jayasuriya (from 10.11.2004 to 31.12.2004)
248/214, Lake Drive
Lotus Grove
Hill Street
Dehiwala.

Eng. M Zubair (from 13.07.2004 to 31.12.2004)
68, Nandana Gardens
Colombo 04.

Mr. C M R Anthony
Chief Project Officer
Science, Maths, Health & Phy. Education Unit
National Institute of Education
P O Box 21, High level Road
Maharagama.

(from 26.07.2004 to 31.12.2004)

Mr. K K V Jayaratne
Director, Dept. of State Accounts
General Treasury
The Secretariat
Colombo 01.

Audit and Management Committee from January to April 2004

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

Audit and Management Committee from May to December 2004

Mr. K K V Jayaratne	Chairman
Dr. J Rathnasiri	Member
Eng. M Zubair	Member
Mr. M Watson	Member

Manual of Procedure

It was decided to prepare "The manual of procedure for NSF" comprising of the tender procedure, procedures in leave and attendance, procedures in general disciplines, etc. and action had been initiated.

STAFF NEWS

Representations by the staff

The staff has represented NSF at six foreign meetings. The details are given in Annex 03.

The NSF staff were representing various national and institutional committees. The details are given in the annexure 04.

Seminars/Conferences/Workshops attended by the NSF staff

The staff of NSF has attended 29 local seminars, conferences and workshops representing the NSF. Details of these meetings are given in Annex 05.

Staff Development & Training

Staff Development Committee (SDC)

SDC was established in Aug 2004 with a view to streamline the staff development process of the NSF. SDC has drafted a training policy for the institution. Nominations for the following training programmes were recommended by the SDC and approved by the NSF.

Event	Date/Place	Nominee
Attachment training in IT	20 th Sep – 17 th Nov	Mrs Amila Tennakone
Sida/ IT management	11 th April – 11 th May	Mrs S.Perera Dr(Mrs) S. Wickremasinghe Mr S.P. Dissanayake
Postgraduate studies in Malaysia	2005/2006	Mr Shantha siri
Technology Foresight	10-21 Nov	Ms Nadeeja Wickremarachchi

SDC has organized in-house training on MS-Word (Basics), MS-Word (Advance) and MS-Excel (Basics) programmes for identified staff members. This programme will be continued on quarterly basis and new training programmes are planned to be added.

Incentives for the staff to upgrade capacity

NSF has decided to provide the following additional increments to those who complete the training programmes while working at the NSF

- 2 increments for completion of MSc programme
- 3 increments for completion of MPhil Programme
- 4 increments for completion of PhD Programme

This scheme was made effective from 01-01-2004.

Staff Development and Training Programmes

MS. Amila Tennakone, Information Officer, attended a 12 week training course on *Information Technology for Information Management* at the National Institute of Science Communication & Information Resources (NISCAIR), New Delhi, 21 September -17 Dec, 2004.

Dr Thamara F. Dias attended the Training programme on “Risk Assessment and Management of GMO/FFP” from 15-16 October 2004, Trans Asia, Colombo.

Dr Thamara F. Dias attended the seminar on “Industrilization and Market Access – Metrology and Testing Requirements for Export”, 13 December, 2004, Taj Samudra, Colombo.

Dr S. Fernando, attended a three months training programme on “Technology Foresight” at the University of Western Sydney from 17th Sep to 20th Dec.

All SLSTIC staff members were trained on the application of Green Stone Digital Library Software and the GENISIS (for interface development for CDS/ISIS databases) to be used as resource persons in the SLSTIC conducted training programmes.

Workshops were conducted to acquaint the library community with the application of CDS/ISIS library software in their information dissemination activities

Postgraduate training

The following officers completed Postgraduate degrees;

Seetha I. Wickremasinghe, Project Manager - PhD (Science Policy)-
Jawaharlal Nehru University, New Delhi, India.

R.M.W. Amaradasa, completed his PhD programme at University of
Wollongong, Australia.

P.R.M.P. Dilrukshi – Researcher - PhD (Zoology), Post Graduate Institute of
Science (PGIS), University of Peradeniya.

Asha Pitadeniya , Scientific Officer- Completed the MSc (Natural Resources
Management)- Postgraduate Institute of Agriculture , University of Peradeniya.

Presentations by the Staff

Dilrukshi , P.R.M.P, A.P. Hettiarachchi, R. Pathirana, S.I. Wickremasinghe “The
employability of Science and Technology graduates passed out from the National
Universities in Sri Lanka”, Proceedings of SLAAS, 2004.

Training Workshops and demonstrations for the staff

NSF has arranged a work shop (in two sessions) for the staff on productivity.
The workshop was conducted by SLIDA.

Programme to educate the staff on protection from fire

A simple programme with a demonstration was organized with the Colombo
Municipal Council in order to educate the staff on how to handle protect
themselves an emergency situation due to a fire.

PRINCIPAL STAFF

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

S & T Policy Research Division

Dr. R M W Amaradasa Director Scientific
B.Sc (Peradeniya), M.Sc (Peradeniya) Affairs/Principal Scientific
Ph.D Officer

Dr. S I Wickremasinghe (Coordinator) Principal Scientific Officer
B.Sc (Hons.) (Peradeniya), M.Sc (Agric.) (Peradeniya)
Ph.D

Mrs. R A S K Perera (until 31.05.2004) Scientific Officer
B.Sc (Hons.) (Colombo)

MIS Unit

Dr. S I Wickremasinghe Project Manager

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

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

Dr. P R M P Dilrukshi Scientific Officer
B.Sc (Hons.) (Peradeniya), Ph.D

Scholarships & Fellowships Division

Mrs. H A U Amarasinghe (Coordinator) Director Scientific Affairs/
B.Sc (Ruhuna), M.Sc (Colombo) Senior Scientific Officer

Mrs. E M I C K Werapitiya Scientific Officer
B.Sc (Agric.) (Hons.) (Peradeniya)

Ms. S A C Moorthy Scientific Officer
B.Sc (Jaffna), M.Sc (Colombo)

Research Grants Division

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

Asst. Director Scientific
Affairs/Senior Scientific Off
Officer

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

Scientific Officer

Ms. S L Tilakeratne
B.A. (Ceylon)

Senior Scientific Officer

Miss A M Pitadeniya
B.Sc (Agric.) (Hons.) (Peradeniya)
M.Sc.(Peradeniya)

Scientific Officer

Mr. S M A W Anuruddha
B.Sc (Hons.) (Colombo)

Scientific Officer

Mr. K G J Karunasena
B.Sc (Agric.) (Hons.) (Peradeniya)
M.Phil (Agric) (Peradeniya)

Scientific Officer

Ms. W A L D Wanasekera (until 01.02.2004)
B.Sc (Hons.) (Open University of Sri Lanka)

Scientific Officer

Technology Promotion Division

Dr.(Ms) T F Dias (Coordinator)
M.Sc. (Hons.) (Moscow), Ph.D (Moscow)

Scientific Officer

Technology Watch Centre

Dr. S R Fernando
M.Sc (Moscow). Ph.D (Moscow), MBA (Colombo)

Project Manager

Mrs. P C Warnasooriya
B.Sc (Hons.) (Colombo)

Scientific Officer

Mr. J G Shanthasiri
B.Sc (Hons.) (Colombo)

Scientific Officer

Miss D N Wickremaarachchi B.Sc (Open Uni.) M.Sc (Sri J'Pura)	Scientific Officer
Mrs. K H T Abeysekera (Until 11.11.2004) B.Sc (Hons.) (Kelaniya)	Editor
Information and Communication Division	
Mrs. P A S F Perera (Head) Officer B.Sc (Colombo), M.Sc (UK)	Principal Information
Miss V N Perera B.Sc (Open University of Sri Lanka), ASLLA	Information Officer
Ms. A Tennakoon B.Sc (Kelaniya)	Information Officer
Mrs. R P Sugathadasa B.Sc (Sri Jayawardenapura)	Information Officer
Ms. V N Dharmaratne ASLLA	Information Officer
Ms. W Weeratunga ASLLA	Information Officer
Mr. H M M Perera	Network Administrator
Printing Unit	
Mr. K P Senanayake	Printing Manager
Administration Division	
Mr. S P Dissanayake (Head) B.Sc (Buis. Adm.) (Sri J'pura), M.A. (IP-New Delhi)	Senior Administrative Officer
Mr. S Galketiya	Senior Administrative Officer
Mr. M K Rathnaweera	Administrative Assistant

Finance Division

Miss K C J T K Fernando (Head)
FCMA

Chief Accountant

Mr. A C M Daniel

Senior Accountant

Ms. Y J Pathirana

Accounting Assistant

Mr. D W Wickremaarachchi

Accounting Assistant

Internal Audit Division

Mr. M H M S Hamid (Head)

Internal Auditor

Confidential Secretaries

Miss P A Palihawadana

Confidential Secretary
(Chairman's Office)

Ms. S P Wijesinghe

Confidential Secretary
(Director's Office)

Research Grants Awarded - 2004

Research Committee on Traditional Medicine

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/TM/01	Dr. Lakshmi Arambewela Manager Natural Products Development Group Ms. Dilmini Warnasuriya Manager Information Service Centre Industrial Technology Institute	Preparation of six monographs on Sri Lankan medicinal plants and analysis. 01 year	Rs. 519,800/-
RG/2004/TM/02	Dr. Mangala Gunatillake Dept. of Physiology Dr. M.D. Lokuhetty Dept. of Pathology Faculty of Medicine University of Colombo	Polpala (<i>Aerva lanata</i>) : its effects on the structure and function of the urinary tract 01 year & 04 months	Rs. 764,313/-
RG/2004/TM/03	Prof. A. M. Abeysekera Dept. of Chemistry University of Sri Jayewardenepura Nugegoda	Studies on the chemistry and standardization of ayurvedic medicinal oils 03 years	Rs. 1,477,000/-
RG/2004/TM/04	Prof. (Mrs.) K. Hirimburegama Head, Dept. of Plant Sciences University of Colombo Dr. N. Jayasuriya NASTECC Dr. R.O.B. Wijesekera 16, Kirimandala Mawatha Nawala	Determinants of a National Strategy for Sri Lanka for Systematic Cultivation of Medicinal and Aromatic Plants 03 years	Rs. 900,500/-

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Research Committee on Chemistry

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/C/01	Prof. V. Kumar Faculty of Science Univ. of Peradeniya Dr(Ms) A. Mudalige Dept. of Chemistry Open University, Nugegoda.	Insecticide compounds from <i>Ginidia glazca</i> to develop biofriendly insecticides. 02 years	Rs.550,000/-
RG/2004/C/02	Dr D.T.U. Abeytunga Dept. of Chemistry Univ. of Colombo.	Screening of basidiomycetes/other fungi in search of biologically active compounds. 02 years	Rs.919,600/-
RG/2004/C/03	Dr S. Siriwardana Ms Dilhara Edirisinghe Ms Priyanthi Perera R.R.I. Ratmalana.	Development of irradiated natural rubber (NR) ethylene-propylene-diene terpolymer (EPDM) based composite materials for outdoor applications. 03 years	Rs.1,386,100/-
RG/2004/C/04	Dr G. Bardarage Dept. of Chemistry Open University Nugegoda.	A theoretical study of mechanisms of ionization, charge transfer and excitation in classical hydrogen atom-bare nuclei collisions in two dimensions. 03 years	Rs.569,750/-
RG/2004/C/05	Dr(Ms) R. Samarasekera ITI Dr(Ms) Indira Weerasinghe Dept. of Entomology MRI Colombo-08.	Biological control of mosquitoes by bacteria and fungi. 02 years	Rs.1,312,160/-
RG/2004/C/06	Prof. E.R. Jansz Dept. of Biochemistry Faculty of Medical Sciences Univ. of Sri Jayewardenepura Nugegoda.	Isolation and characterization mosquito of pupation stimulator and neurotoxin of palmyrah flour. 01 year 06 months	Rs.229,000/-

Research Committee on Physics

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/P/01	Dr. I.M.K. Fernando Dr. D.U.J. Sonnadara Dr. G.A.C. Gomes Dept. of Physics University of Colombo Colombo 03	Characteristics of radiación fields generated by cloud – to –ground and cloud to cloud lightning flashed in Sri Lanka 03 years	Rs.421,574/-
RG/2004/P/02	Dr. J. Bandara Institute of Fundamental Studies Hantana Road Kandy	Direct conversion of solar radiation into electricity through dye-sensitized solar cells 03 years	Rs.920,000/-
RG/2004/P/03	Dr. L.S.G. Liyanage Dr. V.P.S. Perera Department of Physics Open University Prof. K. Tennakone Institute of Fundamental Studies Kandy	Study of Semiconductor Nanostructures for Optoelectronic Devices 03 years	Rs.720,000/-
RG/2004/P/04	Dr. G.K.R. Senadeera Research Fellow Institute of Fundamental Studies Kandy	Synthesis and Characterization of Regioregular conducting Polymers and Their Applications in Low Cost Solar Devices 03 years	Rs.810,300/-
RG/2004/P/05	Dr. Asiri Nanayakkara Senior Research Fellow Institute of Fundamental Studies Hantana Road Kandy	Computer aided designing of new types of conducting polymers and other materials which can be used as good photosensitizers in solar device development 03 years	Rs.539,500/-

Research Committee on Biototechnology

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
SIDA/2004/BT/01	Prof. Rohan Jayasekera Dr Vajira Dissanayake Dept. of Anatomy, Univ. of Colombo.	A study of the association of thrombophilic genetic polymorphisms with pre-eclampsia 01 year	Rs. 2,228,285/=
SIDA/2004/BT/02	Dr Renu Wickremasinghe Dept. of Parasitology Univ. of Sri Jayawardenepura Dr Aresha Manamperi Molecular Medicine Unit Univ. of Kelaniya	<i>Plasmodium vivax</i> relapse pattern in Sri Lanka following 5-day treatment with primaquine 01 year	Rs. 592,343/=
SIDA/2004/BT/03	Dr Sharmila Jayasena Dr Sulochana Wijesundera Dept. of Biochemistry & Molecular Biology Univ. of Colombo	Isolation of a gene encoding a nematode-specific fatty acid and retinol binding protein (<i>far-1</i>) from the filarial parasite <i>Setaria digitata</i> 02 years	Rs. 1,862,000/=
SIDA/2004/BT/04	Prof. Sunil Chandra Dept. of Microbiology Univ. of Kelaniya	Detection and characterization of rabies virus from cases of animal rabies and the evaluation of ELISA as method for monitoring antibody response to canine anti-rabies vaccination 03 years	Rs. 3,714,320/=
SIDA/2004/BT/05	Dr. G. A. U. Jayasekera Dept. of Plant Sciences Univ. of Colombo	Production of transgenic rice plants from Sri Lankan rice varieties mediated by <i>Agrobacterium tumefaciens</i> gene transfer 03 years	Rs. 913,991/-
SIDA/2004/BT/06	Dr. Sarath R. Sirimanne Dr. Sharmila Jayasena Dept. of Biochemistry & Molecular Biology Univ. of Colombo	Cloning of the rice glutelin-B-1 promoter towards the development of rice endosperm specific expression vector 01 year	Rs. 545,040/-

Research Committee on Medicine

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/M/01	Prof. Ajith Abeysekera Dept. of Chemistry Univ. of Sri Jayawardenepura Prof. M.I. Thabrew Dept. of Biochemistry Univ. of Kelaniya.	Investigation of the anti-hepatocarcinogenic effects of <i>Nigella sariva</i> seeds, <i>Cryptolepis buchananii</i> root bark and <i>Smilax glabra</i> rhizome 01 Year	Rs.267,675/-
RG/2004/M/02	Prof. M.I. Thabrew Dept. of Biochemistry Univ. of Kelaniya Prof. E.R. Jansz Dept. of Biochemistry Univ. of Sri Jayawardenepura Nugegoda.	A detailed investigation of the inhibition of intestinal glucose uptake by palmyrah fruit pulp (<i>Borassus flabellifer</i>) flabelliferins 01 Year	Rs.97,000/-
RG/2004/M/03	Prof. R. Sivakanesan Dept. of Biochemistry Dr. S.M.J. Padmifini Suraweera Dept. of Community Medicine Univ. of Peradeniya	Frequency of microalbuminuria and the associated risk factors for microalbuminuria among newly diagnosed type II diabetes mellitus patients. 02 Years	Rs.472,780/-
RG/2004/M/04	Prof. Rohini de Alwis Dept. of Community Medicine Univ. of Colombo	Prevalence and correlates of depression in adults of 25-55 years 01 Year	Rs.112,230/-
RG/2004/M/05	Prof. Janaka de Silva Dept. of Medicine Faculty of Medicine (Dean) Univ. of Kelaniya	Prospective double blind randomized placebo controlled trial on the efficacy of metformin in the treatment of non alcoholic steato hepatitis 02 Years	Rs.340,000/-

RG/2004/M/06	Prof. Ajith Abeysekera Dept. of Chemistry Fac. of Applied Science (Dean) Univ. of Sri Jayawardenepura Nugegoda	Study of antiviral activity of selected herbal preparations 01 Years	Rs. 326,200/-
RG/2004/M/07	Dr. C.D. Ranasinghe Dept. of Pharmacology Prof. H.J. de Silva (Dean) Dept. of Medicine Dr. W.A.D.L. Amarasinghe Dept. of Physiology Fac. of Medicine Univ. of Kelaniya	The relationship between bronchial asthma and gastro-intestinal function in Sri Lankan population 02 Years	Rs. 647,700
RG/2004/M/08	Dr. P.A.D. Tissera Dr. Shamali Damboragama Ministry of Health, Suwasiripya Dr(Ms) S.D.S.P. Rodrigo Health Education Bureau Colombo	Prevalence and impact of malocclusion among children aged 12-15 years in Gampaha district and to assess their knowledge on malocclusion 01 Year	Rs. 145,230/-
RG/2004/M/09	Dr. Lakmini Illangasinghe Eye Surgeon Base Hospital, Gampola.	Management of corneal ulcers - a different approach 01 Year	Rs. 118,900/-
RG/2004/M/12	Dr. C.D.A. Goonasekera Dept. of Anaesthesiology Fac. of Medicine Univ. of Peradeniya.	A study on the urine osmolality :creatinine ratio in healthy humans 01 Year	Rs. 116,825/-
RG/2004/M/13	Prof. N.V.I. Ratnatunga Dept. of Pathology Dr. D.T.D.S. Abeysekera Dr. A.W.M. Wazil Dept. of Nephrology Fac. of Medicine Univ. of Peradeniya	A study of IgA nephropathy in Sri Lanka 02 Years	Rs. 354,809/-
RG/2004/M/14	Prof. P.S. Wijesinghe Dept. of Obstetrics & Gynaecology Univ. of Kelaniya	Study of the influence of zinc concentration in serum and seminal plasma on semen parameters and sexual	Rs. 544,748/-

	Prof. W.D. Rathnasooriya Fac. of Science Univ. of Colombo Prof.(Ms) S. Wimalasena Fac. of Science Univ. of Kelaniya	behaviour 02 Years	
RG/2004/M/15	Dr. L.K.B Mudduwa Dept. of Pathology Dr. A. de S. Nagahawatte Dept. of Microbiology Fac. of Medicine, Galle.	Pilot study on the role of fine needle aspiration in the diagnosis of tuberculosis lymphadenitis 01 Years	Rs.216,100/-
RG/2004/M/16	Dr. K.R.D. de Silva Dept. of Anatomy Fac. of Medicine Univ. of Sri Jayawardenepura Nugegoda	Prevalence of neuro-pathological changes of Alzheimer disease in Sri Lankan postmortem brains and its correlation to atherosclerosis and ApoE genotype 02 Years	Rs.791,108/-
RG/2004/M/17	Dr(Ms)N.P.A..D Gunasinghe Dept. of Anatomy Fac. of Medicine Univ. of Colombo Colombo 08	Histological, immunohistochemical and gene expression study of vascular channels in the matrix of costal cartilage 01 Year	Rs.485,000/-

Research Committee on Science Education

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/SE/01	Dr. S.A.P. Gnanissara National HIV / AIDS Prevention Project Dr. (Ms) R. Hettiarachchi National Institute of Health Sciences	Effectiveness of a teaching skills development training intervention on reproductive health teaching in government schools in District of Kalutara	Rs. 150,000/-

Research Committee on Veterinary Medicine & Animal Science

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/V/02	Dr. Niromi Jayasekera Dept. of Veterinary Basic Sci. Fac. of Vet. Medi. & Animal Sci. Univ. of Peradeniya	Development and endocrinologica changes associated with puberty and sexual maturity in female elephants at the Pinnewela elephant orphanage. 02 Years	Rs.433,000/-
RG/2004/V/03	Dr. T.G. Wijewardena Dr. G.A. Dissanayake Dept. of Pathobiology Fac. of Vet. Medicine Univ. of Peradeniya	Determination of core types of lipopolysaccharide of avian pathogenic <i>E. coli</i> and their immunogenicity 02 Years	Rs.598,271/-
RG/2004/V/05	Dr Ramani H. Priyankarage Dr. Ruwani S. Kalaupahana Prof. Preeni Abeynayake Dept. of Vet. Pathobiology Fac. of Vet. Medicine Univ. of Peradeniya	Post harvest control of Campylobacter in broiler meat through determination of critical control points (CCP) in broiler processing line and design of intervention measures 02 Years	Rs.1,042,437/-
RG/2004/V/06	Dr. A. J. Rajaratne Dept. of Physiology, Fa. of Medicine Dr. Asoka Dangolla Dept. of Vet. Clinical Studies Fac. of Vet. Medi. & Animal Sci. Univ. of Peradeniya	Study on the mechanism of thermoregulation in domestic Asian elephants 02 Years	Rs.473,044/-

Research Committee on Engineering & Built Environment

Grant No.	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/E/01	Dr G.A.C. Gomes Dept. of Physics Univ. of Colombo. Dr M.A.R.M. Fernando Dept. of Electrical & Electronic Engineering Univ. of Peradeniya. Dr I.M.K. Fernando Dept. of Physics Univ. of Colombo. Dr T. Nanayakkara Dr N. Wickramarachchi Dr N. Nanayakkara Dept. of Electrical Eng. Dr C De Silva, Dr S. Jayasena Dept. of Computer Science and Engineering Dr Amith Muminradasa Prof.(Mrs) I. Dayawansa, Dr D. Dias Dept. of Electronics & Telecommunications Eng. Univ. of Moratuwa.	Investigation of earthing systems of lightning protection. 03 years	Rs.769,000/-
RG/2004/E/02	Dr J.J. Wijetunga Mr D.A. Peiris Dept. of Civil Engineering Univ. of Peradeniya.	Design and implementation of a cost effective remote controlled robotic platform for landmine detection and removal. 02 years	Rs.902,500/-
RG/2004/E/03		Wave overtopping on rock slopes of coastal structure without crown walls. 02 years	Rs.384,550/-

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Annexure one

RG/2004/E/04	Prof. Namal Priyantha Dept. of Chemistry Univ. of Peradeniya	Chemical investigation of the removal of heavy metal ions from industrial effluents by natural substances. 03 years	Rs.731,540/-
RG/2004/E/05	Mr K.R.M.U. Bandara Mr S.T. Heart Mr G.S.N. Perera Dept. of Surveying Sciences Sabaragamuwa University Belihuloya	Error analysis of the digital photogrammetric technique. 03 months	Rs.229,391/-
RG/2004/E/06	Dr D.U.J. Somadara Senior Lecturer Dept. of Physics Univ. of Colombo Colombo 03.	3D reconstruction and shape analysis of electrical discharges through image processing. 02 years	Rs.446,000/-
RG/2004/E/07	Dr.(Mrs.) M.D. Weerasinghe Senior Lecturer Department of Civil Engineering University of Moratuwa	Investigation of use of composite trusses in multi-storey buildings in Sri Lanka 02 Yrs.	Rs.1,017,226/-
RG/2004/E/08	Dr. K.S. Walsgama Dept. of Computer Eng. Dr. J.B. Ekanayake Dept. of Electrical & Electronic Engineering University of Peradeniya	Development of algorithms for stereo vision based navigation. 01 Yr.	Rs.181,685/-
RG/2004/E/09	Dr. D.R.I.B. Werellagama Dr. Gemunu Herath Department of Civil Engineering Dr. A. Senaratne Department of Geology University of Peradeniya	Heat Treatment of Oil – Based Sludge 01-Yr.	Rs.351,800/-
RG/2004/E/10	Dr. K.D.W. Nandalal Dept. of Civil Engineering University of Peradeniya Mr R de S. Ariyabandu Water Resources Secretariat 2-125, BMICH Colombo 07	Sri Lankan Water Resources: Their Dynamics and Future Through System Dynamics Simulation 02 Yrs.	Rs.529,560/-

Research Committees on Zoology

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/Zoo/01	Dr S.C. Jayamanne NARA Crow Island Mattakkuliya	Studies on species composition, abundance and distribution of macrobenthos in Negombo estuary, with the view of identifying indicator organisms of environmental conditions 3 years	Rs 966,183/-
RG/2004/Zoo/02	Dr Mayuri R. Wijesinghe	A study of the small mammal communities in the rainforests of Sri Lanka in relation to human disturbance and their implications for conservation 3 years	Rs 605,650/-
RG/2004/Zoo/03	Ms Deepthi Wickramasinghe	A study of some ecological aspects of endemic and threatened frogs <i>Lankamectes corrugata</i> and <i>Fejvaryia kirtisinghei</i> with special reference to their tadpoles 2 years	Rs 364,203/-

Research Committees on Geology & Mineral Resources

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/GMR/01	Dr Rohana Chandrajith Mr H.A.H. Jayasena Dept. of Geology Mr K.B. Ranawana Dept. of Zoology Univ. of Peradeniya	Water quality variation of Pank Cascade Irrigation System (TCIS): Does a segment of flow through 'Tawalla' act as a constructed wetland? 2 years	Rs 1,248,016/-

Research Committees on Food Science

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/FS/01	Dr Jaanaki Gooneratne ITI Dr Chandrani Piyasena Medical Research Institute	Polysaccharides of coconut kernel as a functional food and its blood cholesterol and blood glucose lowering effects on human subjects 2 years	Rs 2,583,200/-
RG/2004/FS/02	Dr Devika de Costa Dept. of Agricultural Biology University of Peradeniya	Screening indigenous antagonists for development of biopesticides against postharvest diseases of banana 2 years	Rs 370,194/-
RG/2004/FS/03	Prof. S. Wimalasena Dept. of Chemistry Univ. of Kelaniya.	Fish and leafy vegetables as a source of long chain polyunsaturated fatty acids and antioxidants	Rs.1,238,640/-

Research Committees on Botany & Microbiology

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/BM/01	Dr D.S.A. Wijesundera Royal Botanic Gardens Peradeniya.	A study of diversity and taxonomy of lichens in the Horton Plains National Park with a view to biomonitor the ecosystem health. 03 years	Rs 432,200/-
RG/2004/BM/02	Dr(Ms) B.T.S.D.P. Kannagara Dr(Ms) N. Deshappriya Dept. of Botany Univ. of Kelaniya.	Isolation and inclusion of mixed leaf litter decomposing fungi in a National culture collection. 03 years	Rs 1,092,000/-
RG/2004/FS/03	Dr M.C.L. Iqbal Plant Reproductive Biology I.F.S. Kandy	Stress induced <i>in vitro</i> regeneration of Indica rice. 02 years	Rs.733,000/-

Research Committee- Social sciences

Grant No	Grantees/Institutions	Title of the project/Duration	Total Allocation
RG/2004/SIDA/SS/01	Ms. Anusha Fonseka No. 134, Pallansena Road, Kochchikade	Survival of a forgotten community through an ethnically defined war: A study on the implications of war on the Portuguese Burghers of Batticaloa 01 Year	Rs.38,400/-
RG/2004/SIDA/SS/02	Prof. W. G. Karunaratna Faculty of Education University of Colombo Mr. B. W. Somaratne Senanayake Madya Maha Vidyalaya Madampe	A study to explore the feasibility of using assignments and projects, which were introduced by the recent education reforms at the G. C. E (A/L) Grades 01 Year	Rs.28,000/-
RG/2004/SIDA/SS/03	Dr. A. Jayawardena Faculty of Education University of Colombo Colombo 03. Mr. T. M. Karunatiakke Kū/Magulaama Maha Vidyalaya Magulagama	A study on the usage of students centered teaching learning approach in the primary grades in Sri Lankan schools 01 Year	Rs.28,120.00
RG/2004/SIDA/SS/04	Dr.(Ms) Nilanthi Heenkenda Dept. of Textile & Clothing Technology University of Moratuwa	An analysis of apparel exports from Sri Lanka 01 Year	Rs.232,958.00
RG/2004/SIDA/SS/05	Dr. Senarath Dissanayake Director Exploration Acting Deputy Director General Dept. of Archaeology Sir Marcus Fernando Mw, Colombo 07 MRs. S. S. Samarathunga Dept. of Archaeology Sir Marcus Fernando Mw, Colombo 07.	GIS Applications in archaeological studies: Distribution patterns of early iron age sites in the Kelani River Valley 03 Years	Rs.246,000.00

Workshops/Seminars/Conferences arranged by NSF

- Progress Review Seminars**

Discipline	Date	Number of presentations
Medicine	22 nd January 2004	06
Medicine	25 th November 2004	06
Zoology	29 th January 2004	06

- Workshops**

Theme	Date & Venue	Number of presentations/ Resource persons	Any follow up activities
CDS/ISIS (Windows version) – Workshop on Advanced applications	5-6 August 2004, NSF Auditorium	10	-
CDS/ISIS (Windows version) – Workshop on Basic applications	16-17 July 2004, NSF Auditorium	05	-
Green Stone Digital Library Software – for Full text electronic documents Workshops – 03	12-13 March 23-24 April 11-12 May 2004, NSF Auditorium	22	-
GENISIS software (web interface development for databases) Workshops Workshops – 03	29 October 04 November 20 November, NSF Auditorium	23	-
Three seminars for library professionals to keep them abreast of new developments in the field of information dissemination technologies & new concepts in the field of management	23 February 26 July 23 November, NSF Auditorium	54 34 32	-
Workshop on Problems and issues related to the treatment of waste water effluents in desiccated coconut and textile finishing industries	18 August, NSF Auditorium	07	-
Brainstorming session for identifying priority areas for research in the field of Food Science	17 th February, NSF Auditorium	35 participants	Priority areas identified were included in the NSF web site
Training workshop on proposal writing in the field of Zoology	23 rd July 2004, NSF Auditorium	05 Resource persons	Participants were requested to send their proposals to NSF for obtaining a certificate
Workshop on Building a Successful Research Carrier	26 th March 2004 11 th June 2004 Institute of Continuing Education in Animal Health and Production, Gannoruwa	20	First day of the Programme, the participants were provided with Guidelines on proposal development aimed at applying for NSF grants, project implementation, progress monitoring etc. and were requested to develop proposals and present on the second day. As a result 6 presentations were made and the NSF received 9 Research Proposals

Theme	Date & Venue	Number of presentations/ Resource persons	Any follow up activities
Training workshop on research in Social Sciences and Humanities	12-14 August, NSF Auditorium	05	Follow-up session held on 04 September
Workshop for the bakery industry	15/07/2004		
Workshop on waste water treatment methods for the desiccated coconut industry and textile industry	18/08/2004		
Workshop on Food Freezing Technology		03	
Workshop on "Cake Preservation"	26 th October	04	Follow up activity of the workshop on bakery industry conducted on 15/07/2004
Workshop on "Managing the future-business opportunities"	01/12/2004	05	
Workshop on "Scientific writing for young scientists in the field of Forestry"	20 August 2004	04 Resource Persons 06 presentations	
World Science Day – 2004 "Scientific thinking and use of innovations for development"	10 November 2004 Navarangahala, Royal College	02 presentations 02 Resource Persons	
Workshop for new NSF Grantees	8 th Oct 2004. NSF	5	New grantees were given guidelines and relevant information related to administration of grants

- **Seminars**

Theme	Date & Venue	Number of presentations/ Resource persons	Any follow up activities
Seminar on food freezing technology	17 th September 2004, NSF Auditorium	07	The Committee suggested to prepare a booklet for distribution among relevant industries
Seminar on exploitation of Sri Lankan industrial mineral resources	17 th November 2004, NSF Auditorium	08	Proceedings have been compiled for distribution among relevant institutions
A symposium on Nanotechnology was conducted with Prof. Ravi Siva, as the chief guest from University of Surrey, UK	27 th February	01	
A seminar on fire retardant cushioning for transport, military and medical applications	16/07/2004	01	
A seminar on "Nanotechnology, past, present and the future" was conducted for the industry, academia and security forces	20/07/2004 NSF Auditorium		
Seminar on "Advances in Biomaterials" for the academia/institutes engaged in medical applications, pharmaceuticals and biomedical R&D	19/08/2004		

Foreign Conferences/Seminars/Workshops

Conference/Seminar	Date(s)/Place	Officer represented
Second session of the Asia Pacific Information Network (APIN)	Institute of Scientific & Technical Information of China from 21-23 October	Ms. Sunethra Perera,
Bio-Asia – The Global Bio-Business Forum	Hydrabad, India from 26-28 February, 2004	Prof. Ranjan Ramasamy. Prof. Sirimali Fernando Prof. S. Widanapathirana Prof. K. Hirimburegama
Consultative meeting on “The Establishment of a Regional Training Centre in Biotechnology”	10-12 March 2004 in Bangkok, Thailand	Prof. Ranjan Ramasamy Prof. Sirimali Fernando
Liaison Officer’s meeting of the ICGB	June 4-6, 2004 in Trieste, Italy.	Dr(Ms) T.F. Dias
The first Meeting of the working group on Biotechnology under the SAARC Technical Committee on S & T	27-28 April, 2004 in Kathmandu	Prof. Sirimali Fernando
STEPAN “Sensitization Workshop on Understanding Development Strategies for Innovation Driven Growth”	11 th -15 th Oct 2004, Seoul, S. Korea	Mr R.M.W. Amaradasa
World Academy of Young Scientists (UNESCO) 1 st General Conference	11 – 13 December 2004 Marrakech, Morocco	Ms Asha Pitadeniya

Representations by the staff at various committees

- M.W. Watson - National Experts Committee on Biodiversity
PGIS, Board of Management
AgBiotech Centre Management Committee
- R.M.W. Amaradasa - Project Coordinators Committee of Science & Technology
Personnel Development Project of the Ministry of Science
Technology
- H.A.U. Amarasinghe - Wildlife Sector Research Committee,
National Wetlands Steering Committee
- Dr(Ms) T.F. Dias- National Coordinating Committee (NCC) meetings of the
National Biosafety Framework Development Project,
Ministry of Environment

Participation at Conferences/Seminars

Conference/Seminar	Date(s)/Place	Name of the person
1 st National Symposium on Geo-Informatics	30 th July, PGIA	I. Werapitiya
Awareness workshop on GMOs/GMFs for Heads of Institutions	9 March 2004 Hilton Colombo Residence	M.W. Watson
BICOST III – Biennial Conference on Science and Technology	16-19 th September	S.I. Wickremasinghe R.M.W. Amaradasa A. Amarasinghe
BICOST III – Inauguration	16 September 2004 BMICH	Tamara Dias Asha Pitadeniya
Conference on 'Fortification of processed foods; The way to healthier diet'	30 th November, Hotel Trans Asia	I. Werapitiya
Consultative workshop on Biosafety	28 May 2004, SLFI, Colombo	Dr(Ms) T.F. Dias
Employment potential of agriculture and veterinary science graduates	08 th May	S.I. Wickremasinghe K.G. Janaka Karunasena
Enhancing agricultural research	01 st November	S.I. Wickremasinghe
Indian Ocean Global Ocean Observing System (IOGOOS) workshop and 2 nd annual meeting	26 th -29 th April, Hotel Taj Samudra	I. Werapitiya
Institute-Industry Partnership workshop	18 March 2004 BMICH	M.W. Watson S. Fernando R.M.W. Amaradasa
National Training Programme on Risk Assessment & Management [as a Resource person]	15 October 2004 Trans Asia Hotel	M.W. Watson
National Training Programme on Risk Assessment and Management	15-16 October 2004, Trans Asia Hotel	S. A. V. Moorthy
New impetus for development of oceanography, marine science and ocean services in Sri Lanka. Preliminary National workshop	21 st -22 nd December, BMICH	I. Werapitiya
Parliamentary Consultative Committee	25 November 2004 Parliament	M.W. Watson
Programme on Sri Lanka journal online	9 th August	S.I. Wickremasinghe R. Wijayaratne S. Tillekaratne
Research and Development – the need for a new research culture (NASTEC)	21 December 2004 University of Colombo	Asha Pitadeniya
Seminar on 'Marketing of innovations'	21 st January, BMICH	I. Werapitiya
Seminar on Marketing of Innovations	21 st January 2004, BMICH	S. A. V. Moorthy
Special Meeting on Nomination	24 December 2004	M.W. Watson

Conference/Seminar	Date(s)/Place	Name of the person
of Peak Wilderness as Mixed World Heritage Site	Office of the Minister of Environment	
Training Programme on leadership	15 th March	S.I.Wickremasinghe R.Wijayaratne
Workshop on 'Our Nation and the Sea Initiative'	3 rd -4 th March, BMICH	I. Werapitiya
Workshop on 'Positive attitudes and Government office procedures and practices'	30 th April, NSF Auditorium	I. Werapitiya
Workshop on 'Post harvest handling and disease control of fruits'	7 th -8 th June, PGIS	I. Werapitiya
Workshop on Capacity Building in Bio-safety	31 st May-1 st June 2004, PGRC	S. A. V. Moorthy
World Academy of Young Scientists (UNESCO) 1 st General Conference	11 - 13 December 2004 Marrakech, Morocco	Asha Pitadeniya
Young Scientists Forum-AGM and Workshop on Scientists and Computers	11 th March 2004, Dept. of Meteorology	S. A. V. Moorthy R.M. W. Amaradasa S. Fernando Shantha siri

	Chemistry	Botany & Microbiology	Medicine	Vet. Medicine & Animal Sc.	Physics	Traditional Medicine	Biotechnology	Forestry
01	Total no of ongoing grants as at 01.01.2004	09	23	07	06	01	-	04
02	Total no of applications received during 2004	10	28	09	07	03	-	-
03	Total no of grants awarded during 2004	06	15	04	05	04	06 ¹	-
04	Total no of on going grants as at 31.12.2004	15	36	11	10	05	12	04
05	Funds allocated for the first year (for grants awarded in 2004) in RS '000	2,713	4,241	1,650,	1,936	2,308	7,098	-
06	Total funds transferred for on-going and new grants for year 2004 in Rs '000	-	700	678	2,375	-	9,031	1,052**
07	Grants completed	07	02	-	01	-	-	-
08	Grants withdrawn	-	-	-	-	-	-	-
09	Grants terminated	-	-	-	-	-	-	-
10	RSs appointed	03	04	-	02	-	-	-
11	RSs registered for Postgraduate degree	01	07	-	01	-	-	-
12	No. of theses submitted	-	-	-	01	-	-	-
13	No. of Publications arising from grants (Foreign)	-	01	-	01	-	-	-
14	No of Publications arising from grants (Local)	-	-	-	02	-	-	-
15	Communications	-	08	03	04	-	-	-

* (02 final reports are being evaluated, 01 being revised)

**Three research grants have been considered here. Although these grants (RG/2003/FR/01,02, and 03) had been approved in year 2003, they were commenced in early 2004. Therefore, first year fund allocation has been considered under this item.

¹ Projects transferred from other disciplines

Summary of Research Grants Scheme- 2004 ...ctd

	Information Technology	Zoology	Geology & Mineral Resources	Food Science	Social Science	MAB	Mathematics	E & BE	Agriculture	Science Education
01	Total no of ongoing grants as at 01.01.2004	24	01	04	01	03	02	28	03	04
02	Total no of applications received during 2004	04	05	02	-	-	-	13	-***	01
03	Total no of grants awarded during 2004	03	01	03	-	-	-	10	-	01
04	Total no of on going grants as at 31.12.2004	24	01	04	-	02	02	33	03	03
05	Funds allocated for the first year (for grants awarded in 2004) in Rs '000	980	868	2,100	-	-	-	4,281	-	150
06	Total funds transferred for on-going and new grants for year 2004 in Rs '000	1,655	263	399	-	118	90	6,081	-	211
07	Grants completed	05	-	01	01	01	-	05	-	02
08	Grants withdrawn	-	-	-	-	-	-	01	-	-
09	Grants terminated	01	-	-	-	-	-	-	-	-
10	RSs appointed	02	01	03	-	-	-	04	-	-
11	RSs registered for Postgraduate degree	01	01	03	-	01	-	02	-	-
12	No. of theses submitted	01	-	-	-	01	01	01	-	-
13	No. of Publications arising from grants (Foreign)	06	-	-	-	03	-	01	-	-
14	No of Publications arising from grants (Local)	-	-	-	-	03	-	04	-	-
15	Communications	-	-	-	-	03	-	08	-	-

*** New grant applications were not encouraged under this Committee in 2004

Summary of Research Grants Scheme– 2004 – Sida projects

Sida/NSF Social Science	Sida/NSF Biotechnology	
Total no of grants operating as at 31.12.2004	20	10
No. of grants completed in 2004	04	-
No of grants withdrawn in 2004	01	-
No of grants terminated in 2004	(RG/2004/SIDA/SS/01)	-
RSs appointed		
RSs registered for postgraduate degree	04	-
No of Postgraduate theses submitted	03	-
No of applications received	09	-
Funds allocated for the first year (grants awarded in 2004)	Rs.485,478	Rs.7,098,345

Details of Thesis submitted

Grant No	Title of the thesis	Grantees/ and (Research Student)	Degree	Institution/s
RG/2001/P/01	Study of Electrical Conductivity and Dielectric Relaxation of PEO based Composite Polymer Electrolytes and PAN Based Polymer Electrolytes.	Prof. M.A.K.L. Dissanayake, Prof. M.A. Careem, (Ms. P.A.R.D. Jayathilaka)	MPhil	University of Peradeniya
RG/2000/MAB/01	Understanding the performance of selected forest species providing non timber forest products.	Dr C.V.S. Gunatilleke Dr K.U. Tennakoon Dr I.A.U.N. Gunatilleke (H. S. Kathirarachchi)	M.Phil	University of Peradeniya
RG/99/E/02	Land use/transport model for Colombo Metropolitan Region.	Dr A.S. Kumara Dr J.M.S. Bandara		Univ. of Moratuwa.
RG/2002/E/01	Fatigue life prediction of existing bridges	Dr PBR Dissanayake Dr KRB Herath Mr. RB Rathnayake (Mr. SASC Siriwardane)	MPhil	Dept. of Civil Engineering, Univ. of Peradeniya.
RG/2002/SIDA/SS/03	The management of facilities and service fees in Sri Lankan schools	(Mrs. M. Abeygunasekera)	M. Phil	University of Peradeniya
RG/2002/SIDA/SS/05	Teachers at work: Student reactions. (An ethnographic study conducted in a few selected schools in the Kandy District)	(Miss. D. M. A. S. Dharmadasa)	M.phil	University of Peradeniya
RG/2003/SIDA/SS/02	A study of the factors influencing the educational achievement of institutionalized children in Sri Lanka	(Mrs. T. S. V. De Zoysa)	Ph. D.	The Open University of Sri Lanka

RG/98/B/01	Documenting biodiversity – A taxonomic study of plant bugs (Hemiptera : Miridae) of Sri Lanka	Dr Anura Wijesekera (S. Basnagala)	MPhil	University of Peradeniya
RG/99/B/4	Studies on diversity and distribution of Lichens and air quality on Ritigala mountain and its vicinity	Dr S.C. Wijeratne (K.W. Gunawardena)	MPhil	University of Sri Jayewardenapura
RG/99/B/6	Developing a bicontrol method to increase shelf life of Embul banana	Ms A.M. Karunaratne (C.J. Ikiriwatte)	MPhil	Univ. of Peradeniya
RG/99/B/8	A study of the distribution patterns of algae on the Southern Coast of Sri Lanka with special reference to anthropogenic effects	Prof. Morley De Silva (M.U. Mallikarachchi)	MPhil	University of Ruhuna

* Name of the awardees of the degree is given in brackets

Scholarships awarded in 2004

Grant No.	Name of the Scholar/University	Project Title	Degree & duration	Total Funds
NSF/Sch/2004/01	Ms V.M. Thadhani Univ. of Peradeniya	Partial synthesis of schisopeltic and pannaric acid derivatives from naturally occurring lichen substance, erythrin	Ph.D 3 years	Rs 582,000/-
NSF/Sch/2004/02	Ms K.G.S. Dilrukshi Univ. of Moratuwa	Physical and numerical modeling of thermally induced cracking in masonry walls	Ph.D 3 years	Rs 582,000/-
NSF/Sch/2004/03	Ms L.V. Athiththan Univ. of Sri Jayewardenepura	Antihypertensive effect of sour milk proteins	M.Phil 2 years	Rs 100,000/-
NSF/Sch/2004/04	Ms W.M.G.C.K. Mannapperuma Univ. of Peradeniya	Sensitivity of different bacteriological analytical methods for detecting Escherichia coli and Coliform bacteria for water quality assessment in Sri Lanka	Ph.D 3 years	Rs 690,000/-
NSF/Sch/2004/05	Ms K.M.L. Kulasekera IFS	Screening of accessions of <i>Brassica juncea</i> for their ability to absorb heavy metals from the soil environment	M.Phil 2 years	Rs 460,000/-
NSF/Sch/2004/06	Ms S.W. Ranasinghe IFS	Mediation of secondary somatic embryos in vitro by excision of terminal meristems	M.Phil 2 years	Rs 460,000/-
NSF/Sch/2004/07	Mr P.H. Premaratne Univ. of Colombo	Characterization of protective antibody responses against <i>Plasmodium vivax</i> Duffy binding protein in endemic populations of Sri Lanka	M.Phil 2 years	Rs 460,000/-
NSF/Sch/2004/08	Ms W.A.W.K. Wijayalath Univ. of Colombo	Studies on "strain"-specific protective immunity to malaria	M.Phil 2 years	Rs 460,000/-
NSF/Sch/2004/09	Mr W.A.R. Manamperi Univ. of Moratuwa	BESTFILL Expert System	M.Sc. 15 months	Rs 275,000/-
NSF/Sch/2004/10	Ms H.M.L.C. Jayawardhana Univ. of Moratuwa	The development of BESTCITY Decision Support System for integrated solid waste management	Ph.D 3 years	Rs 690,000/-

NATIONAL SCIENCE FOUNDATION

BALANCE SHEET AS AT 31ST DECEMBER 2004

(Detailed balance sheet attached)

ASSETS	20-4	20-4	20-3	20-3
Non Current Assets				
Property Plant and Equipment	57110		53425	
		57110		53425
Current Assets				
Inventories/ Stock	1732		1790	
Trade and other receivables	31759		32331	
Prepayments	998		162	
Cash and cash equivalents	6866		9790	
		41355		44073
Total assets		98465		97498
Net assets & Liabilities				
Capital and Reserves				
Accumulated Fund	19849		26432	
Reserves - Revaluation Reserve	51043		51117	
		70892		77549
Non current liabilities				
Provision for gratuity	8897		7448	
Differed revenue	8774		1295	
		17671		8743
Current liabilities				
Payables	6796		4102	
Accrued Expenses	3106		7104	
		9902		11206
		98465		97498

NATIONAL SCIENCE FOUNDATION

INCOME AND EXPENDITURE FOR THE YEAR ENDED 31ST DECEMBER 2004

(Detailed Income and Expenditure account attached)

Revenue	20-4	20-3	
Government Grant	26000	22868	
Other Income			
Interest received	150	163	
Sundry Income	70	41	
Sale of Publications	270	278	
Photocopy receipts	18	31	
Receipts from printing outside jobs	234	144	
SLSTIC Income	232	218	
Profit from sale of Fixed Assets	77	-	
Bond receivable	156	-	
Differed Revenue	3386	185	
Other	115	-	
	15263	36275	30223
Expenditure			
Personal Emoluments			
Salaries & allowances	16282	14846	
Employees Provident Funds	2018	1880	
Employees Trust Funds	403	376	
Provision for retiring gratuity	1829	469	
Overtime	290	237	
Holiday payment	16	9	
Uniforms	72	81	
Sraff training	102	40	
	21012	17938	
Travelling	14	22	
Supplies - Stationary & Consumables	796	694	
Maintenance	1543	1433	
Contractual Service	2863	2639	
Others	3167	3721	
Depreciation	6880	3776	
	15263	36275	30223
Surplus of Deficit over the income			
before extraordinary items		(5,567)	(6,295)
Extraordinary items (Net Profit of loss)		-	-
Net Surplus/ Deficit for the period		(5,567)	(6,295)

NATIONAL SCIENCE FOUNDATION

Cash Flow Statement - 2004

	2004	2003	Rs'000
<u>Cash flows from operating Activities</u>			
Net excess of expenditure over income	(5,567)	(6,295)	
<u>Adjustments for</u>			
Depreciation	(6,816)	(3,776)	
Bad Debts			
Acquisition of assets	2	(12)	
Provision for Gratuity	(1,829)	(468)	
Provision for doubtful debts	-	(213)	
Fixed Assets written off	(341)		
Adjustments made through the provision for doubtful debts	51	7	
Profit on sale of fixed assets	52		
Deffered Revenue	3386	185	
Operating loss before working capital changes	(72)	(2,018)	
Net decrease/increase in trade other receivables	(3,463)	(2,976)	
Decrease in inventories	58	321	
Net decrease/increase in trade payables	(1,303)	(3,700)	
Cash generated from operations	(4,708)	(6,355)	
Net cash from operating activities	(4,780)	(8,373)	
<u>Cash flows from Investing Activities</u>			
Outflow from activities	(26,964)	(24,386)	
Purchase of assets	(2,330)	(1,510)	
Proceeds from sale of equipments	-	-	
Net cash used in investing activities	(29,294)	(25,896)	
<u>Cash Flows from Financial Activities</u>			
Contribution from Government	27900	20,550	
Foreign Aid	3250	9,002	
	31150	29,552	
Net cash from financing activities	(2,924)	(4,717)	
Cash & cash equivalent at beginning period	9790	14,507	
Cash & cash equivalent at end of period	6866	9,790	

NOTES ON ACCOUNTS

1 General Accounting

The Financial Statements have been prepared in accordance with generally accepted accounting principles on a historical cost basis. The fundamental accounting assumptions and policies relevant in accounting have been adhered to on a consistent basis as in the previous year.

Expenditure on equipment purchased under capital budget items have been excluded from expenditure under respective funds and is shown under the relevant categories of equipment.

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

1.1 Documentation Unit Capital Fund Expenditure

	Rs.
1 SLSTIC Equipment	74,235.00
2 SLSTIC Books	62,454.97
3 SLSTIC Workshops & Seminars	<u>24,388.01</u>
	161,077.98
Less: Cost of Equipment & Books	<u>136,689.97</u>
	<u>24,388.01</u>

1.2 Grants for Research & Other Scientific Work

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

At the end of the project if there remain unutilized funds, we create a debtor.

	Rs.
Actual expenditure for the year	25,345,085.08
Accrued expenditure	<u>144,443.68</u>
	25,489,528.76
Research committee on LOICZ	5,550.00
ICGEB membership fee	<u>527,650.00</u>
	26,022,728.76
Less: Cost of Fixed assets	<u>1,324,088.00</u>
	24,698,640.76
Less: Prior year adjustments (Net)	<u>3,643,602.55</u>
	<u>21,055,038.21</u>

1.3 Man & the Biosphere Expenditure

	Rs.
1 MAB Expenditure	5,000.00
2 MAB/1.3/03	241,099.64
3 Bioethics S/C	1,800.00
	<hr/>
	247,899.64
Less: Prior year adjustments	<hr/>
	302,440.00
	<hr/>
	(54,540.36)

1.4 Miscellaneous Fund Expenditure

	Rs.
1 Participation in International Scientific Work	126,789.20
2 Research Training	1,136,333.32
3 Seminars & Symposia	71,246.76
4 Rehabilitation of Assets	149,383.60
5 World Science Day	152,878.65
	<hr/>
	1,636,631.53

1.5 Foreign Aid Expenditure

	Rs.
Foreign Aid miscellaneous	733,460.77
SIDA supported projects	4,055,737.30
	<hr/>
	4,789,198.07
Less: Prior Year Adjustment	<hr/>
	866,706.41
	<hr/>
	3,922,491.66

2 Assets & the basis of their valuation

Depreciable assets & Depreciation

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

Equipment for the value of Rs. 8,361,039/= purchased under the Asian Development Bank Science & Technology Personnel Development Project was handed over to NSF in year 2004.

Depreciation had been under provided for Library Books during the period 1995-2003. This had been rectified in year 2004

Scientific equipment purchased during the period 1983 to 1999 was written off from the book with the approval of the Board of Management.

Capitalization of Assets

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

3 Debtors

	Rs.
Total debtors	12,132,618.05
Less: Provision for doubtful debts	<u>287,695.24</u>
	<u>11,844,922.81</u>

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

4 Liabilities

Creditors

Creditors amounting to Rs. 6,788,508.30 represents monies held by NSF as given below,

	Rs.
1 SIDA RFC A/C	2,840,837.26
2 SIDA	420,182.35
3 Sundry Creditors	10,956.00
4 Staff Creditors	384.99
5 Man Power Survey A/C	257,190.13
6 Research Project on energy	2,478,053.50
<i>Ministry of Science & Technology - Year 2001</i>	
7 Science Magazine - Year 2002	403,357.00
8 Ministry of Science & Technology - Techno Lanka Exhibition - 2004	13,419.01
9 Funds received for Sinharajah Biosphere Project - Year 2002	3,545.44
10 Natural Resources of Sri Lanka - 2000	280,195.50
<i>Sinhala translation - Ministry of Environment-2003</i>	
11 Study on the Bundala National Park- 2003	24,934.36
12 ADB News letter	35,909.50
13 ADB Project A/C	18,943.26
14 MAB/1.3/3/B	600.00
	<u>6,788,508.30</u>

5 Salc of Publications

	Rs.
1 NSF Journal	145,576.00
2 Other Publications	70,242.50
3 SSR journal	9,675.00
4 Posters	16,300.00
5 MAB Publication	1,940.00
6 Vidurawa	6,666.00
7 Food Security	90.00
8 Checklist of Flowering Plants	1,339.00
9 Natural Resources of Sri Lanka (2000)	13,634.60
10 Waders of Sri Lanka	834.17
11 Ficus bengalensis	51.48
12 Guidelines for the safe use of RDN	<u>3,387.30</u>
	<u>269,736.05</u>

5.1 SIISTIC Income

	Rs.
1 Income received from WINISIS	89,483.50
2 Other Income	25,139.00
3 Internet membership fees	117,100.00
	<u>231,722.50</u>

5.2 Research Committee Expenditure

	Rs.
1 Agriculture	1,900.00
2 Biotechnology	13,679.24
3 Energy S/C	2,000.00
4 Editorial Board of JNSF	25,435.00
5 Engineering & Built Environment	11,680.00
6 Forestry	9,444.37
7 Social Sciences Research	18,216.55
8 Science Education	29,123.80
9 Traditional Medicine	10,140.00
10 Zoology	18,507.50
11 Physics	16,250.00
12 Mathematical Sciences	1,800.00
13 Popularization of Science	14,400.00
14 Medicine	33,581.50
15 Botany Microbiology	34,391.17
16 Information Technology	7,862.50
17 Vet. Medicine & Animal Science	14,378.25
18 Food Science	13,420.00
19 Chemistry	20,400.00
20 Life Sciences	1,500.00
21 Geology & Mineral Resources	7,800.00
22 Natural Resources S/C	1,000.00
23 Publication on Forestry	2,510.00
24 Chairperson's Committee Meeting	1,118.25
	<u>310,538.13</u>

5.3 **Sri Lanka Scientific & Technical Information Centre Expenditure**

	Rs.
1 SLSTIC Maintenance & Repairs	82,940.46
2 SLSTIC Periodicals	157,973.11
3 SLSTIC Paper & Board	7,769.00
4 SLSTIC Consumables & Chemicals	28,805.04
5 SLSTIC Miscellaneous	28,189.74
6 Printing - Consumables & Chemicals	239,677.80
7 Printing - Paper & Boards	(25,588.25)
8 Printing - Maintenance & Repairs	<u>181,477.75</u>
	<u>701,244.65</u>

6 **Employees Benefit**

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

7 **Retiring Gratuity**

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

	Rs.
Amount paid for the year	<u>380,202.50</u>
Provision for the year	<u>1,829,150.00</u>

8 Publications for the value of Rs. 5,229,269.50 (Valued at selling price) is available with us. This amount includes the stock out on consignment basis for the value of Rs. 204,252.50

9 NSF owns 12 vehicles. This includes two push bicycles.

10 **Funds Drawn from the Treasury during - 2004**

Consolidated Funds	Rs. <u>27,900,000.00</u>
Recurrent Funds	Rs. <u>26,000,000.00</u>
Foreign Aid Funds	Rs. <u>3,250,000.00</u>

Funds drawn from the Treasury from 1968 to 2004

Consolidated funds	Rs. <u>282,469,276.45</u>
Foreign Aids	Rs. <u>263,281,164.13</u>
Sida funds directly received to NSF during 2004	<u>U\$ 74,667.95</u>
	<u>Rs. 2,539,348.81</u>



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கணக்காய்வாளர் தலைமை அப்திப்பதி திணைக்களம்

AUDITOR-GENERAL'S DEPARTMENT



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My No. }

EL/H/NSF/FA/2004

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உமது இல. }
Your No. }

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திகதி }
Date }

15 June 2005

The Chairman
National Science Foundation

Report of the Auditor General on the accounts of the National Science Foundation for the year ended 31 December 2004 in terms of Section 14(2)(c) of the Finance Act, No. 38 of 1971.

The audit of accounts of the National Science Foundation for the year ended 31 December 2004 was carried out under my direction in pursuance of provisions in Article 154(1) of the Constitution of the Democratic Socialist Republic of Sri Lanka read in conjunction with Section 13(1) of the Finance Act No. 38 of 1971. My observations which I consider should be published with the annual report of the Foundation in terms of Section 14(2)(c) of the Finance Act appear in this report. A detailed report in terms of Section 13(7)(a) of the Finance Act will be forwarded to the Chairman in due course.

1:2 Audit Opinion

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. The audit was carried out in accordance with Sri Lanka Auditing Standards, methods and practices to obtain reasonable assurance as to whether the financial statements are free of material misstatements. The audit included examination of evidence supporting the amounts and disclosures in financial statements and assessment of accounting principles and significant estimates and judgements made in the preparation of financial statements, evaluation of their overall presentation and determining whether accounting policies adopted were appropriate, consistently applied and adequately disclosed. Sub-sections (3) and (4) of Section 13 of the Finance Act, No. 38 of 1971 give discretionary powers to the Auditor General to determine the scope and extent of the audit.

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කොළඹ 07, ශ්‍රී ලංකාව

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INDEPENDENCE SQUARE,
COLOMBO 07, SRI LANKA

දුරකථන
දුරකථන
Telephone } 691151

දුරකථන
பேச்சு இல. } 697451

දුරකථන විද්‍යාලය
E-Mail } oaggov@sltnet.lk

2. Accounts

2:1 Audit Opinion

The draft accounts for the year ended 31 December 2004 had been furnished on 28 February 2005. However, proper final accounts duly signed by the Chairman and the Accountant had not been forwarded to audit upto the date of this report. As such an audit opinion is unable to be expressed.

2:2 Comments on Accounts

2:2:1 Accounting Policies

The following observations are made.

- (a) The method adopted in computing retirement gratuity in terms of standard No. 16 and the accounting policy regarding the primary errors occur during the use of accounting policy in terms of Standard No. 10, had not been disclosed in the accounts.
- (b) During the year under review, a sum of Rs. 21,055,038 had been released as research grant to the respective institutions and officers. This had been deducted from the respective fund and shown as capital expenditure of the year. The amount not belonging to the year too had been included in this expenditure. As such, the correct financial position of the Foundation had not been depicted in the balance for the year ended.

2:2:2 Inappropriate discourses in the accounts

The following observations are made.

- (a) Library books and other stock of stores had not been verified and their values shown in the books. Adjustments had not been made for shortages and excesses.
- (b) According to Note No. 8 annexed to the financial statements, the value of the stock of books as at 31 December 2004 was Rs. 5,229,270. But, it had been shown as Rs. 1,059,112 in the final accounts. As a result, a sum of Rs. 4,170,158 had been understated in the accounts.

- (c) Only 6 varieties of books had been verified. The board of survey concerned had reported the value as Rs. 1,733,390. However, it was Rs. 1,059,112 according to the accounts resulting in an understatement of value by Rs. 674,278.

2:2:3 Accounting Deficiencies

The following observations are made.

- (a) The overprovision of depreciation amounting to Rs. 64,014 of the previous year had not been adjusted to the previous years' P&A. But, it had been accounted for, as income of the current year.
- (b) The depreciation of Rs. 389,767 pertaining to 1994 had not been adjusted in the prior year adjustment account. As a result, the deficit of the current year had been overstated by Rs. 389,767.
- (c) During the disposal of assets valued at Rs. 193,845, the provision for depreciation had been treated as Rs. 245,645. As a result, the profit obtained on disposal of assets had been understated in the accounts by Rs. 51,800.

2:2:4 Lack of Evidence for Audit

The file pertaining to the Energy Research Project for which a sum of Rs. 3,200,000 had been provided for, the physical verification report of fixed assets worth Rs. 103,142,844 and the board of survey reports for the closing stock costing Rs. 1,732,104 had not been furnished to audit. As such, these could not be satisfactorily vouched or accepted in audit.

2:2:5 Non – compliance with Laws, Rules, Regulations and Management Decisions

Action had not been taken in terms of Financial Regulation 297, Treasury Circular No. 58 of 5 May 1968 etc.

3. Financial and Operating Review

3:1 Financial Results

The activities of the Foundation are carried out under the General Fund and 5 Special Funds of the Fund. According to the accounts furnished, the financial results of the General Fund of the Foundation for the year ended 31 December 2004 before taking into consideration the Government grant for recurrent expenditure was a deficit of Rs. 31,566,587. The corresponding deficit for the previous year was Rs. 29,163,481.

The deficit had decreased to Rs. 5,566,857 after taking into consideration the government grant of Rs. 26,000,000 obtained for recurrent expenditure of the year under review and the foreign aid. The deficit for the previous year had decreased to Rs. 6,295,481 after taking into consideration the government grant of Rs. 22,868,000 obtained for recurrent expenditure.

While computing the above deficit, the deferred income of Rs. 2,659,839 pertaining to the previous year had been adjusted in the income of the year under review. As a result, the year's deficit had been understated by Rs. 2,659,839.

3:2 Financial Performance

The financial results of the Foundation and the balance of the General Fund of the year under review compared with those of the previous 5 years are shown below.

Year	Financial Result (Deficit)	Balance of the General Fund as at 31 December (Dr. Balance)
	Rs.	Rs.
2004	(5,566,857)	(65,867,732)
2003	(6,295,482)	(60,979,278)
2002	(4,950,052)	(54,695,523)
2001	(5,690,052)	(50,054,415)
2000	(8,836,448)	(44,526,178)
1999	(5,420,994)	(36,328,209)

Accordingly, the Foundation incurs heavy losses continuously and a result apart from the internal and external usage of funds of the National Science Foundation, it was observed that Rs. 38,294,560 being 75.02% of the Capital Reserves too had been utilized.

3.3 Physical Performance

The performance relating to the research grant of the National Science Foundation for the year under review compared with that of the previous year is shown below.

	2004	2003
No. of grants in existence as at 01 January	135	139
No. of grants in existence as at 31 December	208	161
Total number of applications received during the year	104	155
Grants issued during the year	61	45
Grants completed	31	45
Grants withdrawn	02	01
Grants stopped	01	05
Number of research assistants appointed	22	21
Postgraduate dissertations obtained	11	10
Research Assistants registered for Postgraduate degree	24	15
Media	38	25
Publications		
Foreign	13	09
Local	10	27
Money allocated for grants in existence Rs.	25,924,000	23,466,137

The following observations are made with reference to performance.

- (i) During the year under review, 104 applications had been received for research grants. The number of grants offered were 61. It was 155 and 45 respectively during the previous year. Accordingly, there was an improvement in grants whereas there was a set back in applying for researches.
- (ii) Printing of local publications was low compared to previous year.

3:4 Uneconomic Transactions

A sum of Rs. 2,150,281 had been given to the Foundation for activities relating to the development of science by the Project for Science and Technology Personnel of the Asian Development Bank. Of this, a sum of Rs. 1,560,834 had been spent for payment of salaries and allowances of the unit concerned while a sum of Rs. 128,982 had been spent for repairs to the building. The total expenditure of Rs. 1,689,816 represented 78.58%.

3:5 Extraneous Items

The following observations are made.

- (a) During the year under review, the National Foundation had spent a sum of Rs. 4,317,085 on traveling, subsistence and other expenditure for 69 persons who had gone abroad. The participants of foreign travel should submit a report containing information related to the tour after return to the Island. Further, they should hold seminars to other scientists to inform them of the matters discussed there. However, only 6 officers had submitted their reports and held seminars. 44 officers had submitted reports only. 2 officers had conducted seminars only. It was observed in audit that 17 officers had not done both, that is, submission of reports and holding of seminars.
- (b) Of the 8 seminars held by the participants of foreign tours, during 2004, four had been conducted within the premises and 4 externally. The attendance at the 3 seminars held inside were 02, 02 and 13 respectively. There were no participants at the other seminar. A report pertaining to the participants at the seminars held externally could not be obtained. In the circumstances, the fruitfulness of the seminars held could not be satisfied in audit.
- (c) According to paragraph 2:4:1 of Circular No. MF/6/1/1/96 of 20 April 1996 of the Finance and Planning, travelling claims should have been submitted by the 4 officers concerned who had gone abroad within 30 days. Action had not been taken in terms of Section 2:8:6 of chapter xiv of the Establishments Code to recover penalty from them for not submitting their claims.
- (d) Two officers had not registered themselves for the international conference on the due dates. As a result, an additional expenditure of Rs. 17,856 had to be incurred.

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- (e) A lady officer who had participated in a conference at Vienna in Austria had not furnished the railway ticket. However, a sum of Rs. 21,218 had been reimbursed to her in this connection.
 - (f) An agreement had been reached with a private firm to purchase and install a telephone system (PABX System) valued at Rs. 727,375. Of the agreed amount, a sum of Rs. 545,531 being 75% had been paid in December 2004. According to the agreement, the said work should have been completed within 2 weeks. However, this had not been done even on 28 March 2005. The reason cited was that although the supplier had supplied the equipment at the place concerned, the expected service had not been rendered as the Foundation had proposed an alternative suggestion in this regard.
 - (g) Orders had been placed to buy foreign publications for use at the library of the National Science Foundation in July, September and October 2004 by paying Rs. 17,609, Rs. 58,965 and Rs. 2,869 respectively. Some of these had not been received at the library even on 28 March 2005.

3:6 Implementation of the Project

A sum of Rs. 3,200,000 had been obtained from the Ministry of Science and Technology to implement the Energy Research Project. A sum of Rs. 721,947 had been utilized from this fund during the past few years. The expected objective of the Project had not been achieved. As such, a sum of Rs. 2,478,053 being 77.44%, belonging to the Project funds remained idle.

3:7 Operation of Research Activities

The research activities done are not subjected to proper control by the National Science Foundation. As such, matters such as inordinate delays in research activities, abandonment of research activities, appointment of research assistants on the research officers' discretion and purchase of equipment without plan had taken place. Advances had been given to all these research activities. The sum of Rs. 8,400,556 given for 81 research projects during 1998 to 31 December 2004 had not been settled yet. The Foundation had not taken any action to get this money back remaining in the hands of the officers concerned without being used for any purpose.

The Foundation never takes follow up action with regard to the funds released for research projects. Even the project ledgers had not been properly maintained.

3:8 Slow Moving Assets

A test check carried out with regard to 4 varieties of books printed few years ago revealed that there were 3,292 books valued at Rs. 2,111,920 as at 31 December 2004 and of these 71 books only had been issued during 2004 while there was a balance of 1565 books worth Rs. 1,408,500.

3:9 Fixed Assets

The following observations are made.

- (a) Fixed assets of the National Science Foundation had been given to state institutions affiliated to the National Science Foundation during the previous years. Of these, scientific equipment worth Rs. 27,795,559 had been included in the fixed assets of the National Science Foundation and it had been confirmed that of the above items, items worth Rs. 9,368,126 had been included in the registers of inventories of the institutions concerned and subsequently the value of these assets had been removed from the books. Assets worth Rs. 18,427,433 which had not been confirmed as entered in the registers of inventories of the institutions concerned had been written off from the books without investigation.
- (b) Assets valued at Rs. 27,795,559 handed over to the respective institutions under the research grant had not been properly handed over as per Public Finance Circular No. 58 of 5 May 1968.
- (c) The Foundation had not received confirmations to state that the assets worth Rs. 18,427,433 given as research grant to institutions had been entered in their registers.
- (d) The value of 2 wheeled tractors valued at Rs. 57,457 given to the Coconut Research Institute had been removed from the books. One of these tractors had been sold by the Coconut Research Institute and adjustments had not been made in this connection.
- (e) Assets worth Rs. 27,795,559 which had not been used by the Foundation had been handed over to other institutions under research grant without being resupplied. Instead, provision had been made during the past period. As a result, the General Fund of the Foundation had decreased by Rs. 27,795,559 resulting in a negative position of the Fund.

3:10 Corporate Plan

A corporate plan had not been prepared and the Director had informed that a consultant had been appointed to prepare a corporate plan for the period 2006 - 2010.

3.11 Control over Expenditure

Significant variations were observed between the budgeted and actual figures. As such, the budget had not been utilized as an effective instrument of management control.

4. Systems and Controls

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

- (a) Accounts
- (b) Fixed Assets
- (c) Loan
- (d) Foreign Scholarships
- (e) Running Charts and Log Books

(S.C. Mayadunne)
Auditor General

-/dk.

Comments for the Auditor General's 14 2 (c) report on the Accounts for the year ending 31.12.2004.

2. Accounts

2:1 Audit Opinion

In the draft 14 (2) (C) report issued on 18.04.2005 Audit Opinion has been stated as except for the effect on the financial statements of the matters referred to in para 2.3 of my report, I am of opinion so far as appears from my examination and to the best of my information and according to the explanation given to me, the financial statements have been prepared and presented in accordance with the Generally accepted Accounting Principles and Stated accounting policies as set out in notes (from Note 1 to 8) to the financial statements and give a true and fair view of the financial position of the Foundation as at 31st December 2004 and the financial results and cash flow for the year then ended.

The practice of this Institution for over 20 years has been for the Chief Executive Officer to sign on the Balance Sheet and the Accountant to submit the Final Accounts to the Auditor General by signing the covering letter. All these years a query was not raised. Same procedure was followed in year 2004.

2:2 Comments on Accounts

2:2:1 Accounting Policies

Accounting Std. - 16

- (a) As in previous years the amount paid & the amount provided for gratuity payments are given in the notes on accounts. Since the Auditors have now made a comment in future the method of computing gratuity will be stated in the Notes on Accounts.

Accounting Std. - 10

In previous years too Accounting Standard No. 10 has been applied, but it was not stated in the notes on accounts, since it is a application of a Accounting Standard. In future it could be stated as requested by the auditors.

Research Grant Funds

- (b) The basis of Accounting for Research grants is based on the contractual agreement signed by the grantee and the NSF. This method has been implemented since year 1992.

2:2:2 Inappropriate Disclosures in the Accounts

- (a) If adjustments are necessary according to the Board of Survey report, it will be done in year 2005.
- (b) The amount of Rs. 5,229,210/= given in the notes on Accounts is the total publication stock valued at selling price. This stock includes publications printed since the inception of National Science Council. The practice

throughout had been to debit the relevant expenditure account with the direct cost. The income received from the sale of publications is credited to the income & expenditure account. This method had been adopted since the main purpose of printing publications are not for sale but to disseminate Scientific & Technological Information to all sectors of people.

Since year 2001 the books published under the Special Publications Vote in the Capital Budget is accounted under the stocks valued at the cost price. This is the Rs.1,059,112 shown in the Final Accounts. Hence there is no under valuation.

- (c) If adjustments are necessary according to the Board of Survey it will be done in year 2005.

2:2:3 Accounting Deficiencies

- (a) & (b) Accounting Standard No. 10 has been applied in recording these entries. Hence there is no error as reported by the auditors.
- (C) These items are revalued items. Hence the revalued value has been removed from the books of Accounts. Hence the profit calculated is correct.

2:2:4 Lack of evidence for audit

- Rs. 3.2M - Energy Project Account – Auditors were made available with the file maintained by the Finance Division
- Rs. 103,142,844 - Fixed Assets – This amount includes the value of the Land which is Rs. 42,417,045/=. Board of Survey reports received were made available to auditors. The reports received were Motor Bicycles, bicycles, Telephone Installation Documentation Equipment & Scientific Equipment out on Loan
- Rs. 1,732,104 - Stationary & Consumables stock Board of Survey report was made available to the Auditors

2:2:5 Non Compliance with Laws, Rules Regulations & Management Decisions

- F.R. 297 - Is titled ' Transfer of Stores' – there had not been such a transfer at NSF.

3. Financial & Operating Review

3:1 Financial Results

Accounting standard No. 10 has been applied for the relevant entries in the deferred revenue account. Hence there is no error.

3:2 **Financial Review**

Excess of Expenditure over Income is due to non Cash transactions such as depreciation & gratuity provision. Our expenditure is within the Budgetary allocation. Differed Revenue account has been introduced in year 2003 to counter the effect of depreciation on the Income.

3:3 **Operating Review**

- (ii) Printing of Vidurawa Publication & the Science Education series was terminated by the former management.

3:4 **Uneconomic Transactions**

Comment incorrect. Expenditure incurred out of the Rs. 2,150,281.15 received is Rs. 2,128,193.95. Hence the percentage of expenditure is 98.97%

3:5

- (a) According to the award letter the grantee has to submit a report. A reminder is being sent to the grantees who have not yet submitted the report. If they do not submit the report, their application will not be considered for funding in the future.

According to the award letter grantees may be required to give a seminar in order to share the event with other scientists. Hence the seminar is not a necessity.

- (b) In year 2004 NSF Board of Management decided to discontinue conducting of seminars by travel grantees for logistical reasons.
- (c) Chapter I of circular No. MF/6/1/1/96 dated 20-4-1996 states provisions of this circular will not be applicable to officers proceeding abroad whose expenses are met by a Foreign Agency. Hence the surcharge is not imposed for travel funded by Sida.
- (d) Because of delays in submitting applications & their subsequent processing such rare occasions can not be avoided.
- (e) The loss of train tickets was notified to Director NSF & on his approval the train fare was reimbursed.
- (f) Now the supplier has installed the equipment & the service has been provided
- (g) Reminders will be sent and books will be obtained.

3:6 Implementation of Projects

After the allocation of Rs.3.2m from the Ministry to the NSF in year 2001 for Energy related projects, all such projects were accommodated under this allocation.

The reason for the underutilized funds is that after the Working committee on Energy was disbanded in mid 2002 by the then Management, energy as a research field/ area was not displayed on the NSF website nor advertised when calling for Applications for Research Grants.

As such, the number of applications received by the NSF for energy related projects, naturally, dwindled.

3:7 Conduct of Research Work

Once a grant is awarded, generally the research work is monitored closely through half-yearly progress reports and progress review seminars. As such there is a continuous monitoring process, until the grant period is completed.

With respect to Research Students, they are selected by the grantees to suit the requirements needed for the proposed study. The Research Students are appointed by the University and a copy of the appointment letter is sent to the NSF for information.

With respect to equipment, as a rule, funds are released only for the purchase of the equipment originally requested in the Project Proposal.

If details of the grants cited in the audit Report are made available, then the reasons for any deviations from this usual practice could be given.

Advances for Research Grants

Comment incorrect. Rs. 8,400.556 is not advances granted but the amounts to be refunded from the grants completed/ not functioning. Out of the Rs. 8,400,556/=, Rs. 4,837,549/= is debtors created in 2004. We request the Institutions to refund the balances and also we have requested the Universities to utilize the balance funds of completed projects for ongoing projects. Hence it is incorrect to state that NSF has not taken any action to obtain refunds

Our grant ledgers are updated at the time the payment is being made and the statements of expenditure are received from the Universities/ Institutions.

3:8 Slow moving Assets

If the names of the four publications are given we could comment

Natural Resources of Sri Lanka – 2000 – Publications cannot be sold over night they are available for sale through out the year. Adequate publicity is given for their sale.

3:9 Fixed Assets

- (a) All Institutions have been requested to inventorize the items in their Fixed Asset register. Also it was stated that if a reply is not received by a certain date the items will be written off from our Books of Accounts assuming that these items have been taken in to the Fixed Asset Register of the Institution. Institutions that did not respond, Board of Management granted approval to write off these Scientific Equipment from our Books of Accounts.
- (b) The basis of the transfer of scientific equipment outright to the grantee's Institution was on the decision made by the Board of Management in 1983. Since 1983 this Institution had been transferring Scientific equipment outright to the grantee's Institution according to the Board minute No. 83-6-70.
- (c) All Institutions have been requested to inventorize the items in their Fixed Asset register. Also it was stated that if a reply is not received by a certain date the items will be written off from our Books of Accounts assuming that these items have been taken in to the Fixed Asset Register of the Institution. Institutions that did not respond Board of Management granted approval to write off these Scientific Equipment from our Books of Accounts.
- (d) A two wheel Tractor costing Rs. 8957/= purchased in 1986 had been given to the Coconut Research Institute. This had been auctioned by CRI. Once NSF is informed of the amount of money received from the auction the relevant entries will be made in our books of Accounts
- (e) Scientific Equipment are located at the University/ Institution where the grantee works on the given Research project. Hence Scientific Equipment could be categorized as NSF assets.

From the time the National Science council purchased Scientific Equipment, (may be from late 1970s) these equipment have been treated as equipment of NSC (presently NSF) & depreciation has been calculated.

3:10 Corporate Plan
Comment accepted

3:11 Budgetary Control
As far as possible the Budget is used as an instrument of control.

Dr. M C N Jayasuriya
Director

CF/ns