

ANNUAL REPORT AND ACCOUNTS

1992



NATIONAL AQUATIC RESOURCES AGENCY
Crow Island, Colombo 15.

PREAMBLE

The National Aquatic resources and Development Agency (NARA) made a highly significant contribution towards the development of Aquatic Resources of Sri Lanka during the year 1992.

The void created by the closure of the Inland Fisheries Division of the Department of Fisheries and aquatic resources presented additional responsibilities to NARA in rendering advice and guidance to the private sector for the production of proteinaceous food via inland water bodies and in supporting the export of cultured crustaceans by the private industry.

The repairs and equipping of R.V. "Samudra Maru", NARA's research vessel were completed and R.V. "Samudra Maru" sailed on research and test cruises after four years of dock side activity.

One of the most significant activities at NARA during the year 1992 was the celebration of the tenth Anniversary of NARA. The celebrations composed of three activities namely, Religious, Public and Scientific. The scientific activities comprised of a Scientific symposium attended by Scientists both National and International. The presentations made at the Scientific symposium are as follows:

SCIENTIFIC SESSION - I (Chairman - Prof. H.H.Costa)

01. Marine Biology Programme at NARA
Dr. Pauline Dayarathne
02. Status of the Spiny Lobster fishery along the south coast of Sri Lanka.
Dr. D.S.Jayakody
03. Marine Fisheries Development and Research Needs
Dr. K.Sivasubramaniam.

SCIENTIFIC SESSION II (Chairman Prof. B.L.Panditharathne)

01. Achievement of the Oceanography Division and Future Programmes
Dr. G.Ranatunge
02. Water Exchange Between Puttalam Lagoon and the Open sea.
Mr. K.Arulanandan.
03. Oceanography and Global Climate Change Resent Research.
Prof. A.Gunathilake.

SCIENTIFIC SESSION III (Chairman Mr. N.Ranasinghe)

01. Environmental Studies at NARA
Dr. P.De Alwis

02. Some Observation of the Water Quality Status of Hamilton Canal.
Mr. N.H.Dasanayake.
03. Effects of Effluent from a Pulp and Paper Mill on the Receiving Environment.
Dr. A.P.Mathes.

SCIENTIFIC SESSION IV(Chairman Dr. J.Jinadasa)

01. Inland Aquatic Resources and Aquaculture Programme.
Dr. J.M.P.K.Jayasinghe.
02. Coastal Land use Management with Emphasis on Mangrove Areas.
Mrs. M.D.Amarasinghe.
03. Management of Upper Mahaweli Reservoirs for Fisheries Purposes.
Prof. Mangala De Silva

SCIENTIFIC SESSION V(Chairman Mr. L.B.D. De Silva)

01. Post harvest Technology of NARA.
Dr. S.Y.Namarathne
02. The effects of Sodium Polyphosphate as a Binding Agent on *Oreochromis niloticus* Fish Fillets during Frozen Storage.
Miss. W.M.K.Perera
03. An Integrated Approach in Fishery and Marine by Product Recovery and Utilization.
Dr. Chin H. Cheong.

The presentations gave an opportunity to the public and the Scientific Community to have an insight at the Research and Development activities conducted by the Scientists at NARA.

A compilation of Research Publications by the NARA Scientists during the last decade was presented.

Research and development activities conducted by NARA during 1992 are presented in the divisional reports as given below:

MARINE BIOLOGICAL RESOURCES DIVISION

ANNUAL REPORT 1992

GENERAL

The research programme of the division for 1992 was carried out by 3 permanent research officers and 5 research assistants. 3 Project research officers were engaged in the two foreign funded projects. all the projects of the research programme were continued throughout the year except the Prawn project which was terminated in March 1992 after the resignation of only research officer engaged in this project work. One R.O Mrs. Kumarasinghe left the Australia in February to carry out her Post Graduate studies leading to a Ph.D at the University of Macquarie, New South Wales, Australia. Two R.O's were recruited to the Division in October 1992. In addition to the research programme, several short term research studies were carried out by the officers of this division on the requests made by the Ministry of fisheries & Aquatic Resources.

RESEARCH PROGRAMMES

10 research projects were carried out under the research programme of MBRD. 6 projects were funded by NARA and the other 4 were externally funded.

2.1 NARA funded projects

2.1.1 Study of large pelagic fisheries

Only one research officer were available for this study from the beginning of the year till October 1992. Under this study data were collected through the IPTP/NARA sampling programme. The study area extend southwards from Negombo to Hambantota. All the major fish landing sites were sampled for the catch/ effort data and the length measurement of the important species. Sampling was carried out 10 days a month b the data collectors and the data were brought to the head office to be entered into the computer database. One scientific paper was prepared from this data and presented at the 3rd Asian Fisheries Forum in Oct. 1992. A study on the identification of shark species was commenced in Nov. 1992 with the recruitment a new R.O.

2.1.2 Study of Small Pelagic Fisheries

The sampling programme to collect data on the small meshed gill net fishery was continued during this year. Sampling was carried out from Chilaw to Hambantota. Data for 1990/1991 was analyzed and a paper was prepared on the coastal gill net fisheries in Sri Lanka at the 3rd Asian Fisheries Forum. The fish production in the study area has remained uncharged since 1985 and the catch rate have remained the same. Species composition of catches in some areas have changed.

2.1.3 Prawn Fishery Survey

The work of this project was terminated in February 1992 with the registration of the research officer working for the project. No R.O has yet been recruited and hence the work was not recommended during 1992.

Southern lagoon survey

Regular visits were made to the Malala & Rekawa lagoon to collect information on fish catches, species composition, income, gear type used ect., . A complete bathimetric survey was done and the reports were submitted to the irrigation department for their comments. So far no reply was received from irrigation department and this was informed to the relevant authorities for necessary action. In Malala, the average income of a fisherman was considerably good \. During the peak season, the daily catch of a canoes was around 70 Kg, while during the lean season it was around 12 Kg. The results of this study was presented to the Ministry of Fisheries and Aquatic Resources as well as to the NORAD in the form of a small report with the survey maps.

2.1.4 Lobster Fishery Survey

For nightly visits were made to the South coast to monitor the status of this fishery. During Jan - March period the catches showed a declining trend with an average catch rate of 1 Kg per canoe. With onset of the South West Monsoon the catch rates showed a low value ranging from 0-0.5 kg per canoe per day. Soon after the South -West monsoon the catch rates again increased ranging from 0.5 Kg - 1.0 Kg per canoe per day. Patnangalle lobster season was also started closer to the end of 1992, as a while, the lobster production during 1992 was low when compared to 1991. Spiny lobster prices also in a low level due to the poor demand in the international market.

2.1.5 NW-35 Fishing Operations

Twenty one experimental fishing trips were made during 1992. During Jan - March period bottom long line (BLL) trails were conducted off Kandakuliya , Chilaw, Panadura and Ambalangoda using 1000 - 1500 hooks. All trails were not successful mainly due to the large number of small-scale fishermen engaged in BLL fishery. It was concluded that BLL fishery cannot be conducted profitably in out coastal waters using a big boat like NW - 35 . The protest from other BLL fishermen was so severe that in several occasions they were tempted to cut our fishing line causing 40,000 damage to the fishing gear. With the onset of South - West monsoon , gill net fishery for large pelagic fish was started and conducted till the end of the year. 5" - 6" mesh, 21 ply gill nets were used for the fishing trails and most of the fishing trips were able to conducted profitably.

2.1.6 Demersal Fishery Survey

This project was aimed to assess the exploitation level of the demersal resources on the Western and Southern coasts of Sri Lanka.

Regular sampling visits were made to Chilaw, Negombo through the year and to Beruwala, Hikkaduwa, Dodanduwa, Weligama, Gandara, Tangalle and Patanangala during the calm season. Catch, Effort and species composition of main fishes were collected. The variation of fishing pattern socio-economic aspects and other information related to the fisheries were also collected. In data collected were added to the data collection and analyzed for preparation of scientific papers and reports etc. Bottom long line trails with the collaboration of Kandakuliya, Chilaw, Panadura and Ambalangoda area using NW-35 vessel. These operations were not successful due to social problems.

Following major results were obtained during the year 1992.

- (I) Hand line fishery at Negombo has been carried at throughout the year with little fluctuation in effort. However catch rates remained unchanged between 15-30 Kg/day/boat. Estimated annual production be ranged between 250 and 500 tons.
- (II) BLL at Negombo was successful during Jan-April and December. The catch rates were between and . The main varieties caught were *Lethinus nebulosus*, *L. olivaceus*, *Luthjanids*, *Ephnephelus* sp. and carangids. The fishing operations are carried out off Colombo harbour. The effort of BLL has gone down when compare to the last year.

In Chilaw hand line fishery is mainly an incidental fishery along with small mesh gill nets. BSN and BLL also carried in the non-monsoon season.

During the North-East monsoon period significant amount of BLL and hand line boats operated the South and South-East coasts. Most of these boats are multiday boats and spent 5-6 days at sea brought about 1000 Kg per day.

2.1.7 Study of fish aggregating devices

This project was initiated in August with a request from the Ministry of Fisheries. This is carried out jointly with the National Institute of Fisheries Training. Three FADs were constructed and two were deployed one at Tangalle one at Panadura. One is to be deployed at Chilaw. Since of meeting were held with the fisheries co-operative societies in Tangalle, Panadura and Chilaw. Data sheets were distributed to collect the data on fishing near the FADs

2.2. Foreign Funded Projects

2.2.1 Study of Coral Reefs

Field Research : Inventorization of coastal reefs were continued in the Bar Reef Marine Sanctuary. The investigated area extended up to the continental shelf west of the Kalpitiya Penisular.

Continuation of coral growth experiments in relation to polluted areas due to coconut husk retting in reef lagoons . The experiments are conducted at Polhena where the beach is used extensively for coconut husk retting and Kapparatota is used as the control site. This experiment is expected to yield information whether there is a correlation between the coconut husk seasoning and the apparent coral reef degradation at Polhena.

Some preliminary observations were carried out on fish behaviour in aquariums containing husk retting pits.

Methodology : Several small reef fish, collected from Kapparatota were subjected to different concentrations of polluted sea water containing the leachate from retting coconut husks. Two common reef fish species (*Cheilinus clorurus*) and (*Abudefduf saxatilis*), abundant in unpolluted coral reefs waters were used in the experiment. However, one of the species (*Abudefduf saxatilis*), is fairly common at Polhena (near the retting area).

Observations : Fish subjected to a concentration of 80% solution appeared highly stressed within 1 to 3 minutes and was removed from the tank before they died. Fish introduced to solutions from 50 to 10 % also appeared stressed at beginning but survived for more than 15 hours and were eventually released back into the sea at Kapparatota.

Status of the shallow coral areas of the Bar Reef after the SW monsoon 1992 :

A brief investigation was carried out at the Bar Reef to determine its present condition. The shallow coral reef where the live coral cover was >75% in 1991 has been seriously affected due to anthropogenic activities. Damaged areas are the result of using Bottom set nets and also by collecting live fish for export. In addition over 50 specimens of 'Crown of thorns starfish' (*Acanthaster planci*) were sighted in an area of approximately 500 square meter of which 40 specimens were destroyed.

Visits to fishing communities :

Collection of data necessary for the formulation of a management strategy for the Bar Reef Marine Sanctuary.

Collection of data at Hikkaduwa, in Connection with the development of Special Area Management Plan (SAM Plan) for the Hikkaduwa Marine Sanctuary.

Meeting Gramasewa Niladari (Northern section of the Kalpitiya peninsular) :

Two Gramasewa Niladaris (GN0 from divisions (Nos. 633, 633A) were consulted to obtain details of residents and their occupations. the divisional numbers of 633 and 633A are Dutch Bay and Palliyawatta (on Karaitivu Island, North of Kalpitiya Peninsular) respectively.

Reef Surveys :

A coral reef survey was carried out at Koggala, in connection with an ocean outfall for the effluents from the Free Trade Zone.

A coral reef survey was carried out at Ahungalla in connection with the preparation of an Environmental Impact Assessment (EIA) for a hotel complex.

Coral reef survey, Hikkaduwa Marine Sanctuary to assess its present status.

Identification and cataloging of coral specimens :

Coral specimens collected during surveys were identified, catalogued and deposited in the coral reference collection at NARA. This collection will be the basis for preparation of the field guide to Reef Corals of Sri Lanka.

Meetings/Workshops :

Coastal Advisory Committee Meeting at NARESA (March 1992) . Meeting with the Chief Minister to NWP on developments of the Bar Reef Marine Sanctuary (March 1992).

Workshop on Coastal Resources Management, held at Hikkaduwa (March 1992).

Evaluation workshop on NARA/NARESA/SAREC workshop held at NARA (September 1992) (Abstract published in the booklet of abstracts)

Attended meetings in parliament regarding the Special Area Management Planing at Hikkaduwa.

Attended meeting at Parliament of the Hikkaduwa Marine Park Committee.

Attended several meeting at the Ministry of Fisheries and Aquatic Resources and NARA on restrictions of export of rare and endemic species of marine, brackish and freshwater fish.

A slide presentation on coral reefs of Sri Lanka at a Master Teachers Workshop held at Negombo . This workshop is jointly organized by the CCD and the Ministry of Education (Oct 1992).

Coastal Zone Management, held at NARA, organized by Coastal Resources Management Element of NAREP project.

workshop/Educational Programme held at Southland college at Galle. A slide presentation was given on coral reef conservation.

A work Plan was prepared and submitted to the NWPC with regard to the possible development activities in the Puttalam Lagoon and the Bar Reef Marine Sanctuary.

A preliminary report were prepared in connection with the education centre at Pambala (this was in response to a request from the NWPC).

Participated in 'Sayure Ravaya' (Broadcast Programme). The value of causes of coral degradation was highlighted in this programme.

Preparation and display of photographs and other relevant materials on coral reef degradation in Sri Lanka at the Environ Lanka Exhibition held at the BMICH in Dec. 1992.

2.2.2. Ecological Study of Puttalam Estuarine System and Associated coastal region.

2.2.2.1 Study of Puttalam Estuarine System

Regular biweekly field trips were made to Kalpitiya and collected data on generally the fisheries and specially the length measurement of *Nematalosa nasua* one of the economically most important food fishes inhabit the estuary. This data collection was completed at the end of September as we have collected data for two complete years.

In addition to this collection of Phytoplankton and zooplankton samples was carried out qualitative and quantitative analysis.

The sampling for primary production work was carried out by a Swedish Student assisted by an Officer of the project in December. This study is to be continued with the plankton studies, next year, by one of the officers in the project.

A beam trawl net was designed and trail fishing operations were carried our in December. This beam trawl operation will be carried out monthly next year to collect data for the determination of abundance and distribution of the fin fish and shell fish species of Puttalam estuary.

Two craft and gears surveys of Puttalam Estuarine fisheries were carried out in the year obtain in first hand information of the effort of the fishery of the estuary.

Puttalam Estuarine System.

During the year 1992, 24 biweekly field visits were made to Kalpitiya for collection of catch/Effort data. Length weight measurement of few selected important fish species were also taken to study their population dynamics. Samples of these fish species were also brought to the laboratory to study the reproductive biology and the feeding behaviour of them.

In Kalpitiya around 20, 11 f trawlers and about 35, 3 1/2 f trawlers engaged in trawler operations. They carried out their operations in the Portugal Bay area of the Puttalam estuary without much disturbances since the weather had been favourable throughout the year. In the early part of the year, 1992, very low prawn catch as well as fish catches were obtained.

200 GRP boats and few log rafts were operated in small mesh gill net fishery. In 1992 the catch rates of small meshed gill nets were low compared to 1991. As in other year in September the flying fish fishery was started and coastal till Dec.

In November sampling on Beach Seine fisheries was started. Initially a frame survey was carried out. Two fish landing sites were identified as sampling sites for this fishery.

2.2.2.3 Study of Mundal Estuarine System.

Frame survey was conducted to obtain the no. of fish traps which are operated along the Dutch canal from Muthupanthiya lagoon to Puttalam lagoon in April 1992.

Sampling on trap fishery was commenced in May 1992.

Collecting of data and analyzing of catch data were finished during the period from Sep. 1990 To July 1992.

Participated the preliminary meeting regard to the dispute of Mundal lake fishermen

Abstract of the Mundal lake fishery was prepared for the NARA/SAREC workshop.

Presentation were made to the NARA/NARESA/SAREC workshop which was held on 8th Sept. 1992.

One research paper regard to the fishery of Mundal lake was written.

A frame survey was carried out to determine the no. of Beach Seine operated within the coast line between Udappuwa and Mampuri.

Sampling on coastal beach seine and artisanal fishery were started.

As a result of data analysis, it was found that the catches of major species were significant the water salinity and the rainfall in the Mundal lake.

2.3 Dolphin Study.

Data collecting the no. of dolphins caught in the Sri Lanka fishery was continued during the period January to September 1992.

The socio economic component was subcontracted to the Lanka Marketing Research Bureau. The data processing was commenced in September and continued till December 1992.

The preparation of the final report was commenced in November 1992.

2.2.4 Bio-Socio Economic studies on small pelagic fisheries of South West Coast of Sri Lanka: funded by BOBP

The survey of beach seine fishery , ring net fishery and gill net fishery for small pelagic fishes were carried out fortnightly from January to December 1992 between Dodanduwa and Beruwala.

The purse seine fishery was banned by the Hon. Minister of Fisheries during July 1992 but the purse seine fishery was continued till December 1992. However the data collection from purse seine fishery was not carried out due to practical difficulties.

The ring net fishery was operated at Dodanduwa during the study period at early morning and evening times. The fishes mainly caught by ring nets were frigate, mackerel, bullet tuna , dolphin fish and rainbow runner.

The beach seine nets were operated at all the beach seine fishery centres. The heavy catches of Elannawa parrava each specimen weighing 5-6 Kg caught by beach seine nets from Waturagama and Galbokka. Main fishes caught by beach seine nets were Halmessa, Handalla, Karalla, Hurulla, Salaya, Sudaya, Seer and Carangids.

The small tuna gill nets were operated at Paraliya, Haraspola and Dodanduwa. Small mesh gill nets were operated at Paraliya, Haraspola and Maggona fishing centres. The fishes mainly caught by small tuna gill nets were Alagoduwa, Attawalla, Ragoduwa, Kumbalawa, Thora, Thalapatha, Uluva, Vanna and Bella. The mainly fishes caught by small mesh gill nets were hurulla, Salaya, Sudaya, Halmassa, Jeelawa, Carangids , Bolla, Kumbalawa, Seer, Katta, Katuwalla and Wauvalaya.

The operational coast of the individual boats and nets were recorded and length measurements for the various pelagic fishes were also recorded.

The biological samples were collected analysis were carried out at the laboratory during every month of this period.

New Epson Computer, Monitor and Printer were brought during this period. New computer programme for Bio-economic Study were written for data entering purposes.

Entering of data was started and the programme also tested during this period.

The socio-economic survey was carried out by project socio-economist with the help of staff of Department of Fisheries and Aquatic Resources.

The seasonal frame survey of crafts and gears of study area were carried out on the first week of April 1992.

3. Other Activities

3.1 Service rendered to the Ministry of Fisheries and Aquatic Resources.

3.1.1. Negombo Lagoon Survey.

On the request of the Ministry of Fisheries and Aquatic Resources a survey was carried out to understand the fishery status of the Negombo lagoon. This included the collection of data on fishing parameters.

- (i) No. of crafts
- (ii) Total fish and shrimp production
- (ii) Fishing gear types need.

It was plan to use this data for the formulation of new fishery regulations to the Negombo lagoon. First phase of this survey was completed and interim report was submitted.

3.1.2 A report on the decline in the large pelagic fishes in the south was submitted to the Ministry.

3.2 The officer of division carried out an ecological component of an E.I.A for the Ahungalla Hotel Project for a consultative firm.

3.3 All officers were involved in the prepared of posters for the Expo. 92 Seminar held in Nov. 1992.

3.4 C.Amarasiri involved in preparing teacher guide on marine fisheries for O/L teachers.

Seminar/Workshop

01. Dr. P.dayarathne attended an International Scientific Symposium of IOMAC held in Colombo in Oct 1992.
02. Dr. P.dayarathne, Dr. D.S.Jayakody, Mr. M.M.Alwis and Mr.P.A.A.T Jayawardena attended the 3rd Asian Fisheries Conference in Singapore In Oct 1992.
03. All research officers participated at the SAREC/NARA workshop on Coastal Ecological Studies in Sep. 1992 at NARA.
04. C.Amarasiri has given series of lectures on Marine Biology to the students at Fisheries Training Institute , Mattakkuliya.

04. List of Scientific Papers

Dayarathne, P. Age and growth of seer fish *Scombersmon commerson* (paper presented at the 3rd Asian Fisheries Forum Oct 1992)

Dayarathne, P. & Kumarasinghe, H. Coastal fishery resources utilization by the meshed gill net fishery in Sri Lanka. Paper presented at the 3rd Asian Fisheries Forum Oct 1992.

Alwis, M.M & Dayarathne, P. Present status of the fishery for fin fish and shellfish resources of Puttalm estuary, in the North-Western marine of Sri Lanka.

Jayawardena, P.A.A.T & Dayarathne P.

Jayakody, D.S. Reproductive biology of *Panulirus homarus* on the South coast of Sri Lanka. 3rd Asian Fisheries Forum 1992

Jayakody, D.S. Notes on the phylosoma larval collected from the south west coast of Sri Lanka. lobster Newsletter Dec 1992.

Amarasiri, C. Tree new records of *Lethrinus* around Sri Lanka.
Paper submitted to Vidyoda Journal.

C.Jayawickrama completed her M.Sc. and submitted thesis title.

Dr. P.Dayarathne
Director
Marine Biological Resources Division.

NATIONAL HYDROGRAPHIC OFFICE ANNUAL REPORT 1992

1.0 The National Hydrographic Office (NHO) of National Aquatic resources Agency (NARA) was established on 13th March 1982 jointly with the Sri Lanka Navy and the Survey Department.

The main objectives of the NHO are to carry out detailed hydrographic surveys of island water bodies and inshore, near shore and offshore national ocean space upto the outer limit of the Exclusive Economic zone of Sri Lanka and the production of navigation charts and other documents embodying the results of these surveys.

The main activities of the NHO are to produce the following:

- (a) Navigation Charts of Sri Lanka waters from the territorial baseline to the limit of the Exclusive Economic zone.
- (b) Tide Tables of National Waters.
- (c) C0-Tidal Charts of National Waters.
- (d) Preparation and issue of notices to mariners.
- (e) Continuous updating the above documents.

2.0 Personnel

The staff of the NHO in 1992 was as follows :

- | | |
|---------------------------|---|
| (a) Director/ NHO | Mr. R.De. S.S.Amerasekera, B.Sc.(Ceylon)
M.Eng.(Fred/Canada) |
| (b) Chief Land Surveyor | Mr. Wimal Kumarasinghe,
Professional Exam in advanced Surveying
(Cambridge Univ./U.K) |
| (c) Hydrographic Surveyor | Mr. B.H.B.Nihal Silva
Diploma in Surveying & Leveling |
| (d) Charge Surveyors | Mr. S.W.S.Weerasinghe
B.Sc., Diploma in Programming.

Mr. S.Withana
B.Sc., Prof. Exam in Computer part I, II & III
Australian Computer Society.

Mr. M.A.Ariyawansa
B.Sc., Post Graduate Diploma in Statistics. |
| (e) Land Surveyors | Mr. A.W.Gunasekera
Diploma in Surveying & Leveling
(Adv. Level), (on secondment from Survey dept.) |

- Mr. P.N.Kodykara
Diploma in Surveying & Leveling
(Adv. Level), (on secondment from Survey dept.)
- Mr. H.H.M.N.Weerakumara
Diploma in Surveying and Leveling
- (f) Survey Recorders
- Mr. K.A.Ranasinghe
(on secondment from Sri Lanka Navy)
- Mr. R.D.M. Dharmadasa
(on secondment from Sri Lanka Navy , upto 31.07.92)
- Mr. D.S.Liyanage
(on secondment from Sri Lanka Navy from 31.07.92)
- (g) Draughtsmen
- Mr. P.B.Rathnapala
(Surveyor General's Licence fro Authorized D'men)
- Mr. W.A.Wilfred
(Surveyor General's Licence for Authorized D'men)
- (h) Stenographer/Typist
- Mrs. M.D.C.Jayanthi
Certificate course in word perfect of the IBM
- (i) Consultant Cartographer
- Mr. Walter Gunarathne
Diploma in Cartography (City and Guilds of London)
- (j) Project Personnel
(NARA/GTZ Project)
- Mr. Michael Gruber
M.Sc. Dip. Ing.(Geodesy) Consultant Hydrographer and
Team Leader
- Miss U.Bielke
Dipl. Ing. (Geodesy & Hydrography) Short term expert in
Hydrography(upto 20.12.92)
- Mr.Herman Nuffer
Dipl.Ing. (Electronics) Short term expert in
Electronics(up to 19.04.92)
- Mr. Michael Hesse
Dipl. Ing. (Survey Engineering and Hydrography) Short
term expert in Hydrography(from 10.02.92)
- (k) Electronics Engineer
- Mr. G.D.Nanayakkara
Full Technological Certificate, City & Guilds of London
Institute, associate member institute of electronics and

radio engineers, London incorporated engineer,
Engineering council, London. (from 03.03.92)

(l) Electronics Assistant

Mr. W.K.Senevirathne
Certificate in electronic engineering, National
Apprenticeship board (from 02.11.92)

(m) Electronics Trainee

Mr. M.A.S.Prasad
Diploma in Electronics engineering, Apprentice Training
Institute.

(n) Cartographer

Mr. G.N.Perera
Diploma in Map Production, City & Guilds of London
Institute (from 02.11.92)

(o) Trainee Hydrographic Surveyors

Mrs. S.K.Samaratunge
B.Sc. General. (from 04.11.92)

Mr. A.N.D.Perera
B.Sc. General. (from 16.11.92)

Mr. S.N.S.Amarasinghe
B.Sc.General. (from 10.12.92)

Mr. M.M.G.N.Weerakumara
Diploma of Survey Technician, (Advance Level),
Institute of surveying and Mapping. (from
15.10.92)

(p) Clerk

Mr. D.L.P.Hewage
G.C.E.(A/L). (from 03.08.92)

(q) Driver

Mr. K.R.R.Perera

Mr. B.L.J.Perera
(from 06.11.92)

**03. CHANGE OF PERSONNEL, INCLUDING PROMOTIONS,
CONFIRMATIONS, ETC. AND TRAINING COURSES FOLLOWED**

(A) Mr. S.W.S.Weerasinghe, Charge Surveyor, who was granted two years
No Pay Leave to work abroad, resumed at NHO on 05.08.92.

(b) Mr S.Withana, Charge Surveyor, completed the course in computer
science of the Australian Computer Society.

- (c) Computer training courses in word perfect , Symphony and autocad for the NHO staff, arrange by Mr. Michael Gruber, Consultant Hydrographer, and funded by the NARA/GTZ project , were conducted at the Education Centre of Keells Business Systems Ltd. The courses were conducted during the period 21.07.92 to 22.09.92 with five participants following each training course.
- (d) A training course in seamanship was conducted from 15.06.92 to 19.06.92 at the Mercantile Seaman Training Institute, Galle, for 6 participants from NHO. The training course was funded by the NARA/GTZ project.
- (e) Mr.M.A.Ariyawansa, Charge Surveyor followed the course of training in EEZ Management fro Sustainable Development held in Malta from 05.10.92 to 1.12.92 organized by the International Ocean Institute. The participation of Mr.Ariyawansa was sponsored by the Commonwealth Fund for Tropical Co-operation.

4.0 SEMINARS SYMPOSIA AND WORKSHOPS ATTENDED

- 4.1 Mr. Michael Gruber, Consultant Hydrographer attended a seminar on Project Management held in Goa, India from 15.11.92 to 22.11.92 organized by the German Agency for Technical Co-operation(GTZ) for Team Leaders of German Projects in Sri Lanka and India.
- 4.2 Mr. M.M.G.N.Weerakumara, Trainee Hydrographic Surveyor, participated at the "Infotel Lanka 92", an International Information Technology Conference, held in Colombo on 29.10.92.
- 4.3 A Workshop on Infra-Structural Arrangements in connection with the Medium Size Survey Vessel to be supplied by Germany for the NARA/GTZ Project, was held on 10.04.92 at the Hotel Obroi with the participation of NHO Senior Staff, two officers from the Sri Lanka Navy and the local project team led by the consultant Hydrographer/Project Co-ordinator.
- 4.4 Mr. S.Withana, Charge Surveyor, participated in seminar on " Sattelite Navigation" for instructors of Fisheries Training Centres held at the Fisheries Training Centre, Tangalle from 30.09.92 to 01.10.92 on an invitation by the National Institute of Fisheries Training.
- 4.5 Mr. S.Withana, Charge Surveyor, attended the regional workshop on Coastal Zone Management and Sea Level Rise held on 21st & 22nd February 1992, in Colombo as an observer. This was conducted by the National Oceanic and Atmospheric Conservation department, the Central Environmental Authority and the South Asia Co-operative Environment programme.

4.6 Mr. R.De.S.S.Amarasekera, Director/ NHO, Walter Gunaratne, Consultant Cartographer and M.A.Ariyawansa, Charge Surveyor, participated in the "Sayure Rawaya" radio programme , held on 11.08.92 The emphasis at this programme was on the production of charts and how they are useful to the fishermen.

4.7 Mr. E.M.Weerakoon, 2nd Secretary, Embassy of Sri Lanka in Paris represented Sri Lanka at the XIV th International Hydrographic Conference held in Monaco, from 4.5.92 to 15.5.92, on behalf of the National Hydrographic Office. Sri Lanka is a Member State of the International Hydrographic Organization (IHO) and the NHO is the local Official representative of the IHO in matters relating to Hydrography.

5 TRAINING OF OFFICERS (OUTSIDE DEPARTMENTS)

A demonstration of field and office activities as part of hydrography practical for 27 students following the Degree course in Surveying Science at the Institute of Surveying and Mapping was conducted at the NHO from 07.09.92 to 10.09.92.

The participants familiarized themselves with the operation of the survey boat, hydrographic survey activities, post - processing of data and final drafting of fair sheets.

These practical were to augment the lectures on hydrography delivered by Mr. Michael Gruber at the ISM.

5.1 VISITS TO NHO

An Educational Tour of NARA was conducted by NHO for 30 officers cadets of the Sri Lanka Navy on 16.06.92.

6.0 MEETINGS OF THE BOARD OF DIRECTORS OF NHO

During the period under review meetings of the Board of Directors of NHO were held. The following comprised the Board of Directors:

Mr. M.R.P.Molligoda, Chairman/NARA and Chairman, Board of Directors

Mr. T.Somasekaram, Surveyor General, Member (upto 25.08.92)

Mr. S.Berugoda, Surveyor General, Member (from 29.09.92)

Capt. D.W.K.Sandagiri, Sri Lanka Navy, Member (upto 27.12.92)

Capt. J.T.G.Sundaram, Sri Lanka Navy, Member (from 28.12.92)

Mr. N.C.Senevirathne, Addl.Surveyor General, deputized for the Surveyor General at 6 meetings.

7.0 HYDROGRAPHIC SURVEYS UNDERTAKEN DURING THE PERIOD

7.1 Hydrographic Survey of Lagoons in Hambantota District

This survey was undertaken by the NHO for the Marine Biology Division of NARA for a study of the development potential of six lagoons in Hambantota District, namely, Mawella, Rekawa, Kalametiya, Ambiligala, Malala and Chitragala. As adequate funds were not available to do a complete hydrographic survey of all six lagoons, the survey was confined only to the Malala, Rekawa and Mawella lagoons.

The surveys were carried out according to schedule and the last set of final plans handed over to the client on 03.07.92.

7.2 Cross Section of Rivers flowing into Bolgoda Lake

The hydrographic survey in connection with the above was completed during the period September - October 1992 and the plans were handed over to the client, Land Reclamation & Development Corporation on 15.10.1991. On a subsequent request from the client, in July 1992, a further set of plans with the addition of observed depths and distances on 14 cross sections of the survey, was completed.

8.0 LAND SURVEYS

8.1 Site Survey of NARA Research Station at Kapparatota, Weligama.

This survey was undertaken by NHO in 1991 to expedite the acquisition proceeding and to fence the perimeter of the premises belonging to NARA. The survey was carried out by the Land Surveyors seconded to the NHO from Survey Dept., and under the supervision of Survey Dept. The final plan prepared in NHO by the land surveyors had to be certified and passed by the Supdt. of Surveys, Matara, after inspection of the site. As no progress had been made in this regard all documents pertaining to the survey were handed over to the Survey Dept. to complete the work.

8.2 Calibration of Navitrack, Electronic Distance Measurement Equipment (EDM)

The above survey equipment's were tested and calibrated using the control points established at Panadura and Moratuwa, in connection with the charting programme of the NARA/GTZ project.

8.3 Reopening of Survey Traverses for the NARA/GTZ project.

Survey traverses established earlier between Mount Lavinia and Ja - Ela were re-opened for the charting programme of the NARA/GTZ project.

9.0 MISCELLANEOUS WORK

The following miscellaneous drafting tasks were completed during the period under review :

1. Cover page for the report on work programme of Oceanography Division
2. Plotting of sampling stations locations of Samudra Maru Cruises Nos. 20,25, and 30
3. Cover the reports of the Sri Lanka National Committee of the IUGS.
4. Map title "World Water Supply"
5. Design for laboratory work bench and a cupboard.
6. Map of the coastal belt of the Sri Lanka on scale 1:3000,000 showing sampling locations by Oceanography Division.
7. Map to guide and assist fisherman. The production of this map was undertaken at the request of the Hon. Minister of State for Fisheries and Aquatic Resources . It shows the Bearing and distance from fishery harbours along the coast of Sri Lanka up to the outer limit of the 200 Navitical Mile Exclusive Economic Zone. It also shows the Territorial water limit and the contiguous Zone of Sri Lanka, the Indo-Sri Lanka Maritime boundary, the continuous Zone of India and the outer limit of the EEZ of Maldives. The National Hydrographic Officer completed the drafting of the original and handed it over to the Survey Department for printing. The map is expected to be printed and completed by mid-March 1993.
8. Design for a Wave Tank for Oceanography Division.
9. Organization chart for S&O Division.
10. Title page for a catalogue for Library.
11. Charts depicting programme of work of NHO for 1992 and 1993.
12. Furniture design for NHO.
13. Plans and diagrams in connection with tenders calling for the partitioning of office space of NHO.

10.0 MISCELLANEOUS WORK PERTAINING TO INFRA-STRUCTURE

- 10.1 Tenders were called for partitioning of office space of NHO, by advertising in the Newspapers on 17.11.92. Five tenders were received. The tender will be awarded, after recommendation of the tender board, in January/February 1993.
- 10.2 Quotations were called for the supply of the following items to NHO, by advertising in the Newspapers on 17.11.92 Forty six tenders were received.
 1. Communication Equipment
 2. Office equipment and stationary
 3. Steel Furniture
 4. Bath room fittings and pantry items
 5. Plastic and miscellaneous items
 6. Electrical items
 7. Electrical spares
 8. Drafting equipment, tool and materials

The technical evaluation committees visited the firms which submitted quotations and physically inspected the items offered and submitted their reports.

The tender board met on 24.12.92 and recommended the award of tenders for the following items ;

1. Communication equipment
2. Bathroom fittings and pantry items
- 3 Plastic 7 Miscellaneous items

The tender board will meet again in early January 1993 to evaluate and recommend the award of the balance tenders.

11.0 PROJECT OF TECHNICAL CO-OPERATION BETWEEN SRI LANKA AND GERMANY FOR "STRENGTHENING OF THE NATIONAL HYDROGRAPHIC OFFICE"

The agreement for phase 2 of the project was signed on 19 th November 1991. Date of completion of this phase will be September 1993.

The German commitment in phase 2 is in the form of expertise, equipment, survey boat for near-shore and Inland surveys, a fully equipped medium size survey vessel for off-shore surveys, a small boat, a third project vehicle, equipment for the electronic and mechanical workshops, a technical library and training of local staff.

During the period under review the survey boat, equipment for the electronic workshop and a cross country project vehicle were supplied.

Training courses in seamanship and computers for the officers and study tour in Germany for the Director/NHO were arranged and successfully completed.

A documentary video film on the project, sponsored by the German Embassy was made by Worldview and shown on Rupavahini.

Germany also made available expertise in the field of hydrography and electronics.

A Global Positioning System(GPS) was also supplied by Germany Under the project and observations were carried out at various contour points for its installation, assisted by Mr. Rolf Seimens, assigned by the HPC for the task. The testing and installation is not yet finished and is expected to be completed in January - February 1993. Data acquisition and post processing in respect on two 1:25,00 scale sheets were completed.

Trade test for the recruitment of the following posts were conducted, and final selections made for appointment in early 1993

1. Store Keeper
2. Cartographic draughtsman
3. Accountant
4. Office assistant
5. Two Senior Hydrographic Surveyors

Interviews were held for the recruitment of the following posts and final selections made for appointment in early 1993.

1. Deputy Chief Cartographer
2. System analyst

Approval for the recruitment of the following posts, in 1993, as per the Man Power Development Plan have been given by the Ministry of Policy Planning & Implementation :

1. Assistant Director
2. Chief Cartographer
3. Chief system Analyst
4. System Analyst Programmer
5. Cartographer
6. Senior Draughtsman
7. Cartographic Draughtsman
8. Hydrographic Officer
9. Hydrographic Assistant
10. Skipper (for medium size vessel)
11. Assistant Skipper (coxswain)
12. Mechanic
13. EDP Assistant
14. Typist/Secretary
15. Driver
16. Survey Labourer
17. Office labourer
18. Mechanical Engineer
19. Purchasing Officer
20. Technical Adviser (on a temporary basis)

12.0 CHARTING PROGRAMME OF NHO UNDER THE NARA/GTZ PROJECT

The survey boat gifted by Germany, under NARA/GTZ project arrived in Sri Lanka in late December 1991 and was cleared from customs on 1.01.91

The boat was named "Tharanga". An on the job training programme for the staff in boat handling and survey operations and to test the equipment's on board was carried out during the month of February and early March 1992.

The bathymetric survey in connection with the charting programme to produce systematic charts, on the scale of 1:25,000, commenced on 12.3.92, assisted by Miss U. Bielke, short term expert on hydrography.

A stretch of approximately 21 km upto the 30 meter contour line closed to Colombo was surveyed and data acquisition completed in mid April 1992.

The data acquired covers parts of the two 1:25,000 scale charts Nos. 9101 and 9105. However there are gaps to be surveyed and filled in the near-shore area and offshore area (Beyond 10 km) of those two sheets. This was not possible due to the non-availability of a small survey boat for the near-shore areas and medium size vessel for the offshore areas. Further, the Navitrack Positioning System was also under repairs in Germany.

Post processing of the acquired data was carried out on office with assistance of the German experts. Construction of the bathymetric contour lines in the final depth plots and fairdrawing the lines on drafting film was completed.

A small boat for hydrographic surveying of near-shore areas is under construction locally, funded by NARA/GTZ project, and is expected to be delivered to NHO in early 1993.

13. RECRUITMENT OF STAFF

The following staff were recruited during the period under review :

1. Electronics Engineer
2. Electronics Assistant
3. Trainee Electronics Assistant
4. Four Trainee Hydrographic Surveyors
5. Cartographer
6. Clerk
7. Driver

14.0 IMPROVEMENTS TO INFRASTRUCTURE

14.1 Additional Office Space for NHO

Tenders were collected for partitioning of office space in blocks A and C on 17.11.92 and the tender is expected to be awarded in January 1993.

Air Conditioners were installed in Block A in June 1992.

14.2 Construction of Garage for Vehicles of NHO

The construction of the garage for the three vehicles and the boat commenced in December 1992 and is in progress.

ENVIRONMENTAL STUDY UNIT ANNUAL PROGRESS REPORT 1992

1. **NARA/GCEC Environmental Monitoring Programme**
 - 1.1 **Katunayake Export Processing Zone**

Fifty inspection visits were made to KEPZ and hundred and fifty effluent samples were collected and analyzed for 15 physio-chemical parameters. Analytical reports indicating comments and recommendations were sent to the GCEC
 - 1.2 **Biyagama Export Processing Zone**

Thirty nine inspection visits were made to the BEPZ and samples were collected from the reservoir which receive effluents from sewage treatment plant. Analytical reports with recommendations were sent to the GCEC.
 - 1.3 **Industries Located Outside the Export Processing Zone**

Tan Lanka Ltd.
Inspection visit were made to this leather processing factory and samples were collected from the outlet of the treatment plant as well as from the effluent receiving water body Kelani river.
Reports indicating necessary recommendations were sent to the factory management.
2. **NARA/SAREC Marine Research Programme.**

SAREC Workshop
A research paper on the Nutrient Aspects of Puttalam Estuary was presented in the workshop.

 - 2.1 **Kalpitiya Estuary Environmental Study**

Hundred and eighty four samples were collected from the sampling points at Kalpitiya estuary and analyzed for 06 parameters.
 - 2.2 **Study of pollutant transportation to the coastal system.**

Fish samples were collected from the Kalu Ganga, Kelani River and Puttalam lagoon for the determination of pesticide residues accumulated in the body tissues of fish
3. **Nuwara Eliya Lake Study**

The sedimentation rate of the lake was monitored using the sediment traps set up in the feeder streams of the lake.
4. **Study of the Eutrophication Problem at Kotmale Reservoir**

This Study was continued and sampling was carried out from reservoir and feeder streams. Samples were analyzed for important physio- chemical parameters.

5. **Study of the Water Quality and Pollution Status of the Hamilton Canal**
This study was completed and project report was prepared and submitted to the project supervisor for the comments.
- 6 **Study of the Koggala Lake**
Collection of the baseline data on the water quality of Koggala Lake was carried out for the purpose of studying the impact of industrial development in the area.
7. **NARA/BOBP Project on Pollution Hazards and the Marine Fishery Aspects in the Bay of Bengal Region.**
A short term project was initiated for the purpose of evaluation the status of marine environment and fisheries aspects of Sri Lanka.
- 8 **Study of the Impact of Agricultural Development Activities in Anuradhapura District.**
This study was initiated with the objective of studying the pesticides residues present in the aquatic media and the biota. the sampling locations were selected and preliminary sampling was carried out from the selected locations.
- 9 **Project on the Bio-monitoring for early warning of Pollution.**
The project proposal submitted to the Ministry of Environment for NORAD funding was accepted and funds has been released to NARA for the implementation of this project.
10. **Miscellaneous Projects**
Preparation of sanitation master plan for Anuradhapura District
Arrangements has been made to get one research officer trained at the IFS to do analysis of pesticide residues.
11. **Emergency Studies**
 - 11.1 **Fish Mortality at Nilwala Ganga - Matara**
An investigation was carried out on the reported fish mortality at Nilwala Ganga by ESU staff on 29th May 1992.
Water quality study revealed that high ammonical nitrogen & acidic condition of water in the river would have badly affected the health of the fish.
 - 11.2 **Fish Mortality at Koggala Lake**
An investigation was made on the reported fish mortality in the Koggala lake. It was found that the fish kill was due to an ulcerative disease caused by a pathogen. The investigation report was submitted to NARA.
- 12 **Joint Inspections**
 - 12.1 **Ocean Outfall - Koggala**
A joint inspection was carried out with GCEC, NWS & DB, CCD and CEA on the proposed Ocean outfall for the disposal of effluents from the Koggala EPZ.

13 Exhibitions.

13.1 Gam Udawa 1992

The officers of the ESU were participated in the Gam Udawa exhibition 1992.

13.2 Environ Lanka 1992 Exhibition

The NARA participation in the exhibition was coordinated by the ESU and NARA exhibition stall received a merit award.

14. Meetings Attended

14.1 Ocean Outfall - Koggala

Dr. Padmini DeAlwis participated in the above committee meeting held in National Water Suply & Drainage Board.

14.2 Steering committee meeting on Muthurajawela Master Plan.

Dr. Padmini de Alwis attended the above meetings held in Ministry of Policy Planning & Implementation.

14.3 NAREP Coordinating Committee Meeting

Dr. Padmini de Alwis attended in the above meetings held in Ministry of Environment and Parliamentary.

14.4 Eutrophication Problem at Kotmale Reservoir

Dr. Padmini de Alwis participated in the above meetings held in Sri Lanka Standard Institution.

14.5 Discussion on Environmental Studies

Dr. Padmini de Alwis participated in the above discussion conducted by Sri Lanka Ports Authority.

14.6 Meeting on Kirinda Fishery Harbour Rehabilitation

Dr. Padmini de Alwis attended the meetings on above matter in the Ministry of Fisheries and Aquatic Resources.

15. Seminars, Workshops, and Discussions Attended

15.1 Dr. Padmini de Alwis delivered a lecture on water quality and pollution aspects in a workshop organized by the Central Environmental Authority for the teachers. The workshop was held in the Mahaweli centre.

15.2 Dr. Padmini De Alwis participated in the seminar on Environmentally Sustainable Industries Development organized by the CEA at Sawsiripaya.

15.3 Mr. Hementha Dasanayake Attended the seminar on Preparation of Water Quality Guidelines organized by the NWS & DB.

15.4 Mr. R.W.Fernando attended the seminar on Spectroncopy held in SLAAS .

- 15.5 **SAREC Workshop**
Research paper on the nutrient aspects of Puttalam Estuary was presented in the workshop.
- 15.6 **Workshop on Preparation of Coastal Resources Management Plan.**
Members of the ESU participated in the above workshop held at NARA. This was organized USAID.
- 15.7 **Seminar on production of Pollution Associated with Battery Manufacturing Industry.**
Dr. Padmini De Alwis participated in the above seminar organized by Everady Battery Manufacturing Co. Ltd.
- 15.8 **Workshop on Coastal Resources Management.**
Dr, Padmini De Alwis participated in the above workshop held in CISIR which was organized by the USAID.
- 15.9 **Radio Talk "Sayure Rawaya"**
Dr. Padmini De Alwis participated in the above radio talk conducted by Ministry of Fisheries and Aquatic Resources.

**INSTITUTE OF POST HARVEST TECHNOLOGY
ANNUAL PROGRESS REPORT 1992**

1. Staff

Research Officers (permanent)	05
Research Officers (Trainee)	01
Research Assistants	04
Laboratory Attendants	02
Labourers	05
Typist	01

2. Recruitments

Two Research Officers, Miss B.D.Y.Amarasinghe and Mrs. P.Jayasinghe were recruited in September 1992.

3. Resignations

Dr. S.Y.Namarathne (Research Officer) resigned in August 1992.

4. Leave of absence

Mr. T.S.G.Fonseka (Research Officer) Continued his post graduate studies in UK during the year. Miss W.M.K.Perera left in March to study for a post graduate degree in the U.K. Dr. S.Subasinghe, Director/IPHT continued to be at INFOFISH/ Malaysia, on no pat leave. Mrs. V.Jayaweera returned from U.K. in April, after successfully completed the post graduate studies, and was appointed as the OIC of the division in the absence of Director, as Dr.Namarathne resigned from the post of OIC.

5. Transfers

None

6. Post Graduate Studies

Mr. T.S.G.Fonseka & Miss W.M.K.Perera continued their studies for a Ph.D in the U.K.Miss C.V.Liyanage (trainee research officer) followed the M.Sc. course in Food Science at the University of Sri Jayawardenapura.

7. Promotions

None during the year under review

8. Training Seminars and Workshop.

None during the year 1992.

9. Study Tours

Dr. S.Y.Namarathne accompanied the Hon. State Minister of Fisheries and Aquatic Resources on a study tour to Japan, Malaysia and Singapore , to study various aspects pertaining topmost harvest fisheries such as fish processing and marketing.

10. Progress of Projects

10.1 Prawn feed Formulation (UNDP/NARA)

This Project, which was funded by the UNDP, was commenced in January with the view of formulate a prawn feed utilizing prawn offal. A literature survey on the nutritional requirements of prawns and a survey of local ingredients was carried out initially, the chemical composition of selected ingredients and commercially available samples of feed was determined. As the officer in charge of the project left for post graduate studies, this project was suspended temporarily till her return or until an officer trained in this field was available to continue the project.

10.2 Weight loss and Biochemical Changes in Food Fish During Frozen Storage.

Information on the storage characteristics of our food fish is minimal. A study was commenced in April to study the weight loss and biochemical changes in two fish varieties, during frozen storage. A literature survey on the fatty acid profiles and analytical methodology was carried out. The two varieties selected for the study were Skipjack tuna and Carrangids. The frozen storage trials commenced in September, and samples were analyzed at monthly intervals for a wide range of parameters. the project will be completed in 1993.

10.3 Succession of spoilage microorganisms in fish during storage in ice

Ice storage characteristics of a number of our fish species have been studied at IPHT. The storage characteristics of some commercially important species, however, have not been determined, one of which was *Lethrinus* species. An ice storage trial was commenced in August and the deterioration in quality was followed organoleptically, chemically and microbiologically. The fish kept at an acceptable condition for 24 days, but was unacceptable on the 28th day. The succession of micro flora during the storage period was also studied. The report is under preparation.

10.4 Ice Meltage Trials (ODNRI/BOBP/NARA joint Project)

The project which commenced in 1991 was continued. Ice melting rates of the insulated boxes designed for the bicycle carrier and the trailer were compared with wooden boxes of similar dimensions. The project was suspended temporarily from February to September, due to non-availability of funds. the work on the project was resumed in October and three studies on ice melting rates of the new insulated fish box and the traditional wooden box were conducted and a report was prepared.

10.5 Quality Assessment of Mollusca Shellfish

The quality changes during storage in ice was studied over a period of 15 days. the deterioration in quality was followed organoleptically, chemically and microbiologically. The mussels were found to be unacceptable on the 8th day of storage. the succession of microflora during the storage period was studied. The storage of cooked and vacuum-pouched mussel was investigated. the microbiological and chemical properties of the packed cooked mussel were determined at intervals. The presence of Clostridium sp. and Bacillus sp. were investigated. The reports of the above project are under preparation.

10.6 The Effect of freeze-thaw stress on the survival of pathogenic bacteria

The survival of *Vibrio parahaemolyticus* during freezing and frozen storage was studied. The growth of the organism in fish homogenate at optimum temperature (37°C) showed that it can multiply rapidly (generation time of about 23 minutes) to infections levels. Freezing and frozen storage reduced the organism in fish homogenate, an demonstrated freeze-thaw injury. The results also indicated that the organism was protected against freeze-thaw injury when present in fish homogenate. A report was prepared.

11.0 Extension Work, Test Services and Dissemination of Information

11.1 National Training Programme on Fish Inspection and Quality Control

The above programme, organized by IPHT with the assistance of the Export Development Board was held from 13-21st February, at NARA. Lectures were conducted by experts from FAO, INFOFISH, Fisheries and Oceans Canada and the Sri Lanka Standards Institution. A total of 15 participants attended the training programme.

11.2 Nine test reports on mercury content of frozen sword fish were issued.

11.3 Thirty nine test reports on the bacteriological quality of fish, prawns and w have been issued.

11.4 Lectures on Post Harvest Fish Technology were delivered to

a) Participants of a fish quality control Seminar/workshop organized by the SLSI.

b) Final year Zoology special students of the University of Kelaniya.

11.5 A programme and a budget estimate on an exhibition of products developed at IPHT was prepared and handed over to NARA.

11.6 An Officer participated in a Seminar at Ambalangoda to educate the fishermen on the various activities at NARA which relate directly to them.

11.7 Personnel from the division participated in a Workshop held for self employment of women, during the fisheries work in the Kalutara district, on the preparation of the following:

- 1) Jelly from seaweed
- 2) Jaadi
- 3) Improved method for the preparation of Maldivian fish
- 4) Rasajeewa
- 5) Ambul-thiyal
- 6) Fish Feed

11.8 Fishery products and posters highlighting the activities of the division were prepared and displayed at

- a) Gam Udawa exhibition
- b) Expo'92

12. Reports and Publications

12.1 K.W.S. Ariyawanse - The effect of freeze thaw stress on the survival of *Vibrio parahaemolyticus* dissertation submitted to the University of Peradeniya (Supervisor - Dr. V. Jayaweera)

12.2 B.D.Y. Amarasinghe - A comparative study on the ice melting rates of traditional wooden fish boxes and the improved insulated fish boxes designed for cycle and motor cycle traders.

13. Supervision of Projects

Dr. V. Jayaweera supervised Miss K.W.S. Ariyawanse B.Sc (Agriculture) final year project.

14. Constraints

1. Lack of equipment, glassware, chemicals and media.

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Project carried out during 1992.

1. Mollusc Culture Project

Study on the litter production, decomposition and associated microbiology of mangroves in Negombo lagoon.

Selection of suitable sites for freshwater prawn (*Macrobrachium rosenbergi* in North Western Province).

Accumulation of chromium in water sediments and in selected fish species of the Kelani River due to industrial pollution.

Artemia Culture Project

Reservoir Fishery project

Seaweed Culture project

Effluent monitoring in shrimp farms and use of mollusc to treat effluent in shrimp culture systems.

Staff

Out of the total cadre of 13 officers three officers are attending Ph.D programmes abroad. Two officers are involved in split, Ph.D programmes. One officer is in her final stages of a local Ph.D programme. Four officers are involved in postgraduate studies leading to Masters degrees.

One senior officer left during 1992 and one officer was recruited to the division.

Consultancy

The division has earned Rs. 3,25,000/= from consultancy work. The consultancies included site assessments for shrimp culture, water quality management pathological aspects in fish ponds etc.

Extension Work

Seminars were conducted to shrimp farms, ornamental fish breeders, services were offered in pond management aspects for small scale farmers. Several surveys were carried out in order to resolve problems related to user conflicts and resource allocation with reference to Aquaculture and mangrove area management.

Six exhibitions were represented in areas of ornamental fish culture, mangrove resource and aquaculture.

Academic Involvements

Staff member delivered lecture in Universities and also supervised graduate students in their special projects. Members of the staff served in communities such as Scoping committee for land allocation etc.

Reservoir Fishery Development Project

This study was concluded. The officer in charge of this project left NARA.

Seaweed Culture Projects

The officer was involved in collecting data and research activities for her split Ph.D programme. The activities included biomass estimation of natural resources. Experimental culture at Kalpitiya and socio-economic aspects. The officer returned back to her university for data analysis and also to prepare her Ph.D dissertation.

Development and improvement of Environmental impact assessment methodology.

Development/improvement of Environmental impact assessment methodologies for wetlands.

The officer was involved in data collection and research activities as her research component for split Ph.D programme. Studies included collection of data related to EIA procedures, salt water intrusion economic aspect etc. The officer is about to return for data analysis and to prepare the Ph.D Thesis.

Officer in charge : Mrs. V. Pahalawattarachchi
Project : Selection of suitable sites for fresh water prawn (*Macrobrachium rosenbergii*) in North Western provincial area.

Description of work : Seven physico-chemical parameters were monitored in selected tanks in Puttalam and Kurunegala districts. Present land use patterns and other tank characteristics also were studied.

Officer in charge : Mrs. P.R.M. Wijegoonawardena

1. Project and : Accumulation of chromium in water sediments selected fish species of the Kelani River due to Industrial pollution.

- 2. Description of work:** Sediment samples collected were analyzed for the following parameters.
- A. Total chromium
 - B. Particle size
 - C. Organic carbon
 - D. Separated soil fractions were analyzed for total chromium.
- Water samples were analyzed for physico chemical parameters.
- Fish samples were diested unanalyzed for total chromium in different organs.
- 3. Training :** Attended a training programme on "Fish physiology and prevention of epizootic" held in Japan (March 92 - June 92)
- 4. Seminars conferences attended:**
- 5. Extension Work :** Preparation of the Expo 92 display board for the IARD Division.
- 6. Consultancy work :** Consultancy services on disease diagnosis and remedial measures for ornamental fish at Hotel Hilton.
- 7. Publications :** "Stake seine fishery for economically important shrimps in Chilaw lagoon Sri Lanka with special reference to environmental factors affecting catches" (completed)
- 8. Constraints :** The water samples of the project (A) was not able to analyze yet at the instrument used for this analysis is not to be repaired a IFS Kandy.
- Officer in charge :** P. Kithsiri
- 1. Project :** Mollusc culture
- 2. Description of Work:** Puttalam Lagoon
Species available
- Oyster - *Crassostrea madrasensis*
 - Clams - *Marna Opima*
Marna hiantina
 - Cockles- *Gafrarium tumidum*
 - Mussel - Transplanted *Perna perna*
1. Study of community structure, fishery and biology of clams and cockles in Puttalam lagoon.

- a) Distribution of species
- b) Recruitment of patterns
- c) Physio-chemical parameters
- d) Exploitation level
- e) Reproduction and sea rations
- f) Growth
- g) Condition index
- h) Predators

- 2. Growth study of oyster (*Crassostrea madrasensis*) on concrete blocks.
- 3. Growth study of brown mussels on rafts.
- 4. Study of environmental factors effecting to spat falling of oyster at Kala Oya.

Following activities were carried out at Trincomalee.

- 1. Raft culture of green mussels (*Perna viridis*)
- 2. Growth study of green mussels with and without fouling organisms.

- Extension Work** : Mussel culture programme was continued with North Western provincial council.
Model of a molluscs culture raft was displayed at BMICH for Environs Lanka exhibition.
- Training** : Attended to the integrated fish farming training course in China for 3 months.
- Officer in charge** : Mrs. V. Pahalawattarachchi
- Project** : Study on the litter production decomposition and associated microbiology of mangroves in Negombo Lagoon.
- Description of work** : Litter production and decomposition studies were completed and interim report was produced.

The isolated litter decomposed fungi were tested for cellulose, pectin and lignin activity. The fungi were identified as far as possible.

Decomposed litter in various stages were tested for carbon and nitrogen contents.

The thesis preparation and the final report writing are in progress.

Training : Participated in a training on Coastal Ecosystems conducted by CCD/NAREP at Hikkaduwa.

Seminars, Conferences attended:

Extension work (Lecture) Participation for scoping committee meeting which was held in Southern Councils on August 1992.

Constraints : Nil.

Officer in charge : Mrs. M.M. Kuruppu

Project :Development of techniques for Artemia culture in Sri Lanka and evaluation of its dietary value for use in larvae rearing.

Description of Work : Feeding experiments with *Penaeus monodon* using Artemia cultured in Palavi were completed and the samples were sent to Belgium for nutritional analysis.

Hatching experiments were completed and data are being analyzed at the Statistical Department, University of Colombo.

Publications : Two publications have been prepared on culture trials. The report for the funding agency (CARP) is in preparation.

FINAL ACCOUNTS

1992



NATIONAL AQUATIC RESOURCES AGENCY

COLOMBO 15.

**NATIONAL AQUATIC RESOURCES RESEARCH &
DEVELOPMENT AGENCY**

Balance Sheet as at 31st December 1992

1991		1992
	Capital Employment	
44,601,301	Balance B/F as the last year	72,117,134.09
12,860,000	Grant for the year (Sch: 13)	10,525,000.00
21,633,822	Foreign Aid for the year (Sch: 14)	26,361,648.98
12,300,000	Other Contribution	3,108,008.70
91,395,123		112,111,791.77
(9,458,086)	Excess of Expenditure over income	(10,660,942.36)
81,937,037		101,450,849.41
	Fixed Assets (Sch: 15)	
4,964,542	Buildings	4,528,912.69
1,583,751	Machinery	1,323,656.70
5,247,681	Equipment	4,984,817.79
444,472	Furniture & Fittings	537,526.39
942,956	Library Books and Journals	796,268.07
1,103,107	Vehicles	853,458.62
222,232	Main pond	186,094.35
340,860	Auditorium	364,320.37
6,239,625	Other capital projects (Sch: 16)	5,988,735.55
496,457	Work in progress	496,457.50
48,499,519	Foreign Aided projects	68,122,768.00
12,000,000	Samudra Maru Vessel	13,883,073.17
	Cycles & other inventory items	21,456.00
82,085,202		102,087,545.20
	Current Assets	
727,369	Stocks (Sch: 17)	677,138.30
1,331,811	Debtors (Sch: 18)	1,685,950.52
233,715	Deposits (Sch: 19)	242,215.00
1,226,326	Advances (Sch: 20)	1,635,935.57
1,603,751	Debtors Employees (Sch: 21)	1,696,897.66
9,332,473	Cash & Bank (Sch: 22)	9,171,142.04
14,455,346		15,109,279.09
	Less:	
	Current Liabilities	
4,128,780	Creditors & Accrued Expenses (Sch: 23)	7,459,964.65
5,937,685	Project Creditors (Sch: 24)	3,278,771.47
2,057,443	Provision (Sch: 25)	3,133,377.74
2,479,604	Consultancy Projects (Sch: 26)	1,873,861.02
(14,603,512)		15,745,974.88
(148,165)	Net Current Assets/(Liabilities)	636,695.79
81,937,037		101,450,849.41

**NATIONAL AQUATIC RESOURCES RESEARCH &
DEVELOPMENT AGENCY**

Income & Expenditure Accounts for the Year ended 31st December 1992

1991		1992	
	Receipts		
14,000,000.00	Government contribution (Sche:01)	17,500,000.00	
169,041.00	Sundry Income (Sche: 02)	665,238.25	
302,658.00	Other Contribution (Sche: 03)	955,794.63	
----	Grants Received (Sche: 04)	9,819,903.82	
-----		-----	
14,471,698.00			28,940,936.70
	Administrative Expenses		
8,179,528.00	Salaries & Allowances..... (Sche: 05,06)	8,088,236.84	
597,032.00	Provision for Gratuity	895,548.00	
1,102,168.00	E.P.F & E.T.F (Sche: 07)	1,183,773.59	
1,003,772.00	Overtime	1,397,731.88	
486,019.00	Traveling	396,999.73	
574,827.00	Security Charges	676,952.19	
126,337.00	Fees (Board Meetings/Other Meetings)	142,364.79	
840,538.00	Fuel	1,035,402.25	
185,575.00	Advertising	176,980.50	
642,467.00	Stationery	547,087.04	
40,084.00	Postage	40,252.00	
48,117.00	Entertainment	81,398.05	
18,052.00	Welfare	22,371.00	
58,293.00	Telephone	96,072.90	
67,583.00	Foreign Travelling	148,787.74	
365,742.00	Sundries (Sche: 09)	1,128,840.33	
2,102,297.00	maintenance of Motor Vehicles, Buildings, Vessels, Boat & Equipment etc. (Sche: 10)	1,186,996.40	
--	Uniforms	---	
50,000.00	Audit Fees	50,000.00	
4,650.00	Bank Charges	9,511.10	
186,408.00	Consumables (Sche: 11)	176,165.71	
61,476.00	Printing	46,747.00	
2,669.00	Provision for Bad Debts	250,000.00	
302,658.00	Special Project Expenses (Sche:03)	955,794.63	
13,099.00	Turnover	---	
-----		-----	
17,059,391.00			20,734,023.67
	Establishment Expenses		
1,373,323.00	Electricity	1,428,103.54	
43,329.00	Gas	27,353.00	
673,000.00	Rent & Rates	672,195.00	
-----		-----	
5,146,250.00			
22,205,641.00	Provision for Depreciation (sch 12)	14,242,400.56	16,370,052.10
(7,733,943.00)	Excess of Expenditure Over Income		(8,163,129.07)
(1,724,142.00)	Prior Year Adjustments		(2,497,813.29)
-----			-----
(9,458,085.00)			(10,660,942.36)
-----			-----

(1) Accounting Policies

(a) Basis of Accounting

The Financial Statements have been prepared under the historical cost conservation in accordance with generally accepted accounting principles applied on a basis consistent with that of the proceeding year except following.

Since the Research & Development expenditure is no longer regarded as recoverable, it has been written off at a rate of 20% per annum in a regular basis according to the life time of the project.

(b) Deferred Research & Development Cost

I. The amount charge to the profit and loss account for the current year is Rs 10,947,828.37 .

II	Movement in Deferred Research & Development Cost	
	Balance as at 01.01.1992	Rs. 85,059,332.37
	Charged for the current year	Rs.(10,947,828.82)
	Balance as at 31.12.1992	Rs. 74,111,503.55

(c) Inventors

(d) Depreciation

Fixed Assets are shown in the financial statements of cost less accumulated depreciation to the rate of the balance sheet. The provision for the depreciation is calculated annually on the straight line method. No depreciation has been provided on the year of purchase.

Depreciation rates are as follows:

I	Buildings	10%
II	Equipment	10%
III	Furniture and Fitting	10%
IV	Motor Vehicles	10%
V	Vessel/Boats	10%
VI	Bicycles	10%
VII	Auditorium	10%
VIII	Main Point	10%
IX	Library Books	10%
X	Research and Development (Locally funded projects)	20%
XI	Research and Development (Locally funded projects)	20%
XII	Other	10%

- (e) **Gratuity**
The provisions has been made in the financial statement for liabilities under the gratuities Act no. 12 of 1988.
- (f) **Receivable**
Receivables are reflected at their realizable values after making adequate provision for any unrecoverable awards.
- (g) **Sale of Fixed Assets**
Any profit or loss arising in the sale of fixed assets are accounted in the income & expenditure account.
- (h) **Event after Balance Sheet Date**
The following vehicles were sold in 1992

Vehicle No.	Sale price Rs.
1. 28/4199	128,898.99
2. 28/3763	64,150.00
3. 31/4725	12,779.99
4. 31/5530	91,789.00
5. 38/9968	60,560.00

	<u>473,188.92</u>

(2) Liabilities

Provisions has been made for following unpaid expenditure relating to the period from 1988 to 1992.

(1). Rates and Taxes Rs. 3,080,025.00

(3) Inventories

	1992	1991
(a) Consumables	165,999.00	238,750.00
(b) Work in Progress	496,457.00	496,457.00

(4) Fixed Assets

	Cost	Acc. Dep.	1992 W.D.V.	1991 W.D.V.
(a) Building	14,223,275.00	9,694,363.00	4,528,913.00	4,964,542.00
(b) Machinery	3,160,513.00	1,836,856.00	1,323,657.00	1,583,751.00
(c) Equipment	10,516,977.00	5,532,159.00	4,984,818.00	5,247,681.00
(d) Furniture and fittings	1,042,065.00	504,539.00	537,526.00	444,472.00
(e) Library books	3,383,327.00	587,059.00	796,268.00	942,956.00
(f) Vehicles	2,496,485.00	1,643,027.00	853,459.00	1,103,107.00
(g) Main pond	361,376.00	175,282.00	186,094.00	222,232.00
(h) Auditorium	588,641.00	224,321.00	364,320.00	340,860.00
(i) Other projects (Research and Development)	7,236,661.00	1,247,925.00	5,988,736.00	6,239,625.00
(j) Foreign Funded Projects (Research and Development)	77,822,672.00	9,699,904.00	68,122,768.00	48,499,519.00
(k) Vessel/ Boat	14,008,074.00	120,000.00	13,883,073.00	12,000,000.00

Ⓞ Bicycle	12,070.00	----	12,070.00	----
(m) Other	9,386.00	----	9,380.00	----
Total	132,856,529.00	31,265,435.00	101,502,788.00	82,085,202.00

(5) Commitments and contingencies

(a) Capital commitments contracted for and outstanding as at balance sheet date accounting to Rs 1,144,731.00

Samudra Maru vessel	885,115.00
Furniture & Fittings	13,866.00
Equipment	238,250.00
Laboratory Equipment	7,500.00
Total	1,144,731.00

(6) The accumulated consolidated fund balance as at 31.12.1992 is Rs. 82,642,134.00

(7) Prior year adjustments - Rs. 2,497,813.29

(I) Provision made for rates and taxes for the period from 1979 to 1990	2,407,830.00
(II) Transport expenditure charged to year 1992	2,403.00
(III) Allowances charged to year '92	23,647.00
(IV) Printing expenditure charged to year '92	1,425.00
(V) Accrued expenses for the year '92	61,531.29

(8) Grants Received

(a) Grants Related to Income

- (I) Government grant received for recurrent nature expenditure amounting to Rs. 1,750,000.00 is credited to income & expenditure account.
- (II) Government grants received for capital nature expenditure is Rs. 10,525,000.00 for the year.
- (III) Government grants are made for the ordinary activities of the institute.

(b) Grants Related to Assets

- (I) Assets are shown at the original cost and depreciated according to the expected useful life of the assets.
- (II) The grant also charged to the income & expenditure account according to the expenditure useful life of the assets.

C/C.

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 எனது இல. }
 My No. }
 ඔබේ අංකය }
 உமது இல. }
 Your No. }



පිගනකාධිපති දෙපාර්තමේන්තුව
 නිදහස් විකුරලය, කොළඹ 7, ශ්‍රී ලංකාව
 கனரக அமைச்சு அலுவலகம் அறிவுறுத்தி திணைக்களம்,
 சுதந்திர சதுக்கம், கொழும்பு 7, இலங்கை
 AUDITOR-GENERAL'S DEPARTMENT
 INDEPENDENCE SQUARE, COLOMBO 7, SRI LANKA

දිනය/த.த.த./Date. 30 August 1994

The Chairman,
 National Aquatic Resources, Research
 and Development Agency.

Report of the Auditor General on the Accounts of the
 National Aquatic Resources Research and Development Agency
 for the year ended 31 December 1992 in terms of Section
 14(2)(c) of the Finance Act No. 38 of 1971.

The audit of accounts of the National Aquatic Resources Research and Development Agency (NARA) for the year ended 31 December 1992 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. In carrying out this audit, I was assisted by a firm of accountants in public practice. My observations which I consider should be published with the annual report of the agency in terms of Section 14(2)(c) of the Finance Act appear in this report. A detailed report in terms of Section 13(7)(c) of the Finance Act was forwarded to the Chairman of the agency on 26 October 1993.

1:2 Scope of Audit

Audit opinion, comments and findings in this report are based on a review of the financial statements presented to audit and substantive tests of samples of transactions. The scope and extent of such review and tests were such as to enable as wide an audit coverage as possible within the limitations of staff, other resources and time available to me. Sub-sections (3) and (4) of Section 13 of the Finance Act give discretionary powers to the Auditor General to determine the scope and extent of the audit.

2. Accounts

2.1 Opinion

In view of my observations appearing in this report, I am unable to express an opinion on the accounts presented. Major deficiencies observed in this connection are tabulated below:

<u>Deficiency</u>	<u>Reference to Paragraph in the report</u>
(a) Accounting Policies	2 : 5 : 1
(b) Omissions in the accounts	2 : 5 : 2
(c) Inappropriate Disclosures in the accounts	2 : 5 : 3
(d) Overstatements and understatements in the accounts	2 : 5 : 4
(e) Unreconciled Control Accounts	2 : 5 : 5
(f) Uncertainties regarding Accounts Receivable and Payable	2 : 5 : 6
(g) Lack of Evidence for Audit	2 : 5 : 7
(h) Non-compliance with Laws, Rules, Regulations, Management Decisions etc.	2 : 5 : 8
(i) Unreliability of Financial results and Financial position	3 : 1
(j) Weaknesses in Systems and Controls	4

2:2 Financial Results

According to the accounts presented, the working of the Agency during the year under review had resulted in a deficit of Rs. 8,163,129 as compared with the deficit of Rs. 7,733,944 for the preceding year. The following statement gives a summary of the financial results for the year under review and the preceding year.

	<u>Year ended 31 December</u>				
	Rs.	<u>1992</u>	Rs.	<u>1991</u>	Rs.
<u>Income</u>					
Government Contribution	17,500,000			14,000,000	
Sundry Income	665,238			169,041	
Grant Received	<u>9,819,904</u>	27,985,142		<u>-</u>	14,169,041
<u>Expenditure</u>					
Administrative	20,734,014			17,059,393	
Establishment	2,127,651			2,089,742	
Depreciation	<u>14,242,401</u>			<u>3,056,508</u>	
	37,104,066			22,205,643	
<u>Less</u>					
Amount recovered from Projects	<u>955,795</u>	<u>36,148,271</u>		<u>302,658</u>	<u>21,902,985</u>
Deficit for the year		(8,163,129)			(7,733,944)
Accumulated Deficit Brought Forward	(45,433,758)			(35,975,672)	
<u>Less</u>					
Prior year adjustments	<u>(12,317,717)</u>	<u>(57,751,475)</u>		<u>(1,724,142)</u>	<u>(37,699,814)</u>
Accumulated deficit Carried Forward		(65,914,604)			(45,433,758)
		=====			=====

Contd...4/-

2:3 Financial Structure

According to the accounts presented, the financial structure of the Agency as at 31 December 1992 compared with that as at 31 December 1991 is given in the following statement.

	<u>As at 31 December</u>			
	Rs.	<u>1992</u>	Rs.	Rs. <u>1991</u> Rs.
<u>Resources</u>				
Government Contribution		70,838,380		60,313,380
Foreign Aid	89,501,431		63,139,782	
Adjustments for Special Dollar Account Balance:	(8,853,775)	30,647,656	(8,853,775)	54,286,007
Other Contributions		<u>15,879,417</u>		<u>12,771,409</u>
		167,365,453		127,370,796
Accumulated Deficit		<u>(65,914,604)</u>		<u>(45,433,758)</u>
		<u>101,450,849</u>		<u>81,937,038</u>
		=====		=====
<u>Utilisation</u>				
Fixed Assets at written down value		13,596,511		14,849,602
Vessel "Samudra Maru"		13,832,073		12,000,000
Foreign Aid Projects (net)		68,122,768		48,499,519
Other Projects (net)		5,998,736		6,239,625
Capital Work-in-Progress		496,457		496,457
Net Current Liabilities		<u>(636,626)</u>		<u>(148,165)</u>
		<u>101,450,849</u>		<u>81,937,038</u>
		=====		=====

Contd....5/-

2:4 Source and Application of Funds

The following statement shows the source and application of funds of the Agency during the year under review.

	Rs.	Rs.	Rs.	Rs.
<u>Source</u>				
Government Contribution				10,525,000
Foreign Aid				26,361,649
Other Capital Contribution				3,108,008
Proceeds ^{from} disposal of Fixed Assets				<u>65,005</u>
				40,059,662
<u>Application</u>				
Deficit for the year			(8,163,129)	
Adjustments for items not involving movement of funds.				
Depreciation-Fixed Assets	3,294,573			
Project Expenditure	<u>10,947,829</u>	14,242,402		
Profit on sale of Fixed Assets		<u>(65,005)</u>	14,177,397	
Prior year adjustments			<u>(12,317,717)</u>	
			<u>(6,303,449)</u>	
Addition to Fixed Assets		(4,051,473)		
Adjustments for Library Books		<u>126,918</u>	(3,924,555)	
Increase in Expenditure on Foreign Aid Projects			(29,323,153)	
Increase in Expenditure on Other Projects			<u>(997,036)</u>	(40,548,193)
Decrease in Working Capital as analysed below				<u><u>(488,531)</u></u>

	<u>Effect on Working Capital</u>		
	<u>Increase</u>	<u>Decrease</u>	
	Rs.	Rs.	
Stocks	-	50,231	
Debtors	104,140	-	
Deposits Receivable	8,500	-	
Advances	409,709	-	
Staff Loans Receivable	93,146	-	
Cash and Bank Balances	-	161,332	
Creditors and Accrued Expenses	-	3,331,185	
Provisions for Employee Gratuity	-	825,935	
Consultancy Projects	605,743	-	
Projects Creditors	<u>2,658,914</u>	-	
	<u>3,880,152</u>	<u>4,368,683</u>	(488,531)
	=====	=====	=====

2:5 Comments on Accounts

2:5:1 Accounting Policies

Following observations are made:

- (a) The project expenditure totalling Rs. 74,111,504 as at the end of the year under review had been shown as Fixed Assets Viz. Rs.68,122,768 under Foreign Aid Projects and Rs.5,988,736 under other Projects. The cost contains accumulated amounts incurred in respect of both capital and revenue expenditure. This expenditure had not been amortised in the previous years. However, in the current year project expenditure had been amortised at 20% of the balance brought forward from the previous years. The amortisation so provided amounted to Rs. 10,947,829.
- (b) The sum of Rs. 9,819,904 shown as income in the income and expenditure account for the year represents a book entry which is made up by writing back the capital portion of grant received equivalent to amortisation provided for the previous years on foreign funded projects (Rs.9,699,904) and the depreciation on vessel "Samudra Noru" (Rs.120,000). This accounting treatment is not consistent with that of the previous year.

2:5:2 Omissions in the accounts

Following omissions were observed:

- (a) The assets transferred from the former Fish Technology Division of the Ministry of Fisheries to the Agency when the latter was established in 1981 had not been valued and brought to account after getting them vested in terms of the Act.
- (b) Rates payable to the Colombo Municipal Council amounting to Rs. 3.08 million were outstanding since 1979 and a provision had not been made for payment of penalty amounting to Rs. 1.54 million.

Contd....7/-

2:5:3 Inappropriate Disclosures in the Accounts

Following observations are made.

- (a) A sum of Rs. 1,696,969 paid as advances for overhaul of boats and vessels had been inappropriately Capitalised although the work had not been completed as on the date of the Balance Sheet.
- (b) A sum of Rs. 123,040 received as reimbursement of expenses from U.N.D.P. has been credited to capital employed instead of the UNDP debtor account.
- (c) An advance of Rs. 40,500 paid in connection with a capital work had not been capitalised although the work had been completed during the year.
- (d) A sum of Rs. 135,130 paid as an advance for purchase of a Radio for the vessel had been capitalised eventhough the radio had not been received.
- (e) A sum of Rs. 221,168 paid in advance for the purchase of books had been capitalised although the books had not been received during the year. Depreciation has also been calculated on non-existing library books.
- (f) Purchases of certain consumable materials valued at Rs. 96,694 had been capitalised as well as included in closing stocks.
- (g) Purchase of consumable stocks such as chemicals valued at Rs.32,990 had been charged to chemical expenditure account and the entire amount had been included in the closing stocks too.
- (h) Action had not been taken to adjust the accounts by cancelling cheques valued at Rs. 41,911, the validity period of which had expired.
- (i) Rent on Kadukella land at Rs. 1,838 per annum and penalty accrued due to delay in payment amounting to Rs.136,875 had neither been paid nor provided for in the accounts.

(j) Sundry expenses totalling Rs. 1,128,840 included the following exceptional items:

	Rs.
Gamudawa Construction	78,750
Tenth Anniversary Celebrations	166,500
Contribution to Ministry	54,500
Radio Programme	274,180
Exhibition Expenses	<u>163,955</u>
	737,885
	=====

(k) Long outstanding Petty Cash advances totalling Rs.50,000 paid for purchases of goods for the sales outlet continued to be shown as assets.

(l) A sum of Rs. 895,548 being 50% added to the provision for payment of gratuity for the previous year had been provided for during the year under review instead of making provision in terms of Payment of Gratuity Act No. 12 of 1983.

(m) The balance of the Special Dollar Account as at 31 December 1992 at the Central Bank maintained by the Agency on behalf of U.N.D.P. had not been included in the accounts nor disclosed as a note to the accounts.

Contd...9/-

2:5:4 Overstatements and understatements
in the accounts

Following overstatements and understatements were observed.

- (a) A cheque for Rs.32,150 issued to C.V.E. and realised at the bank in May 1992 remained outstanding in the bank reconciliation statement. Subsequently, the amount concerned had been credited in the bank account whilst charging the sundries account with a similar amount.
- (b) Depreciation on vessels/boats had been under provided by Rs. 1,080,000.

2:5:5 Unreconciled Control Accounts

Following observations are made.

- (a) Petty cash advances as per ledger was Rs. 410,163 whereas the schedule showed a balance of Rs.474,059.
- (b) Research and Development expenses funded by the U.N.D.P. and N.H.O. had been accounted under two projects. The Agency had not reconciled the Project Accounts with the memorandum accounts. A difference of Rs.114,423 between the U.N.D.P. books and U.A.R.A. books was observed in audit.

Contd...10/-

2:5:6 Uncertainties regarding Accounts Receivable and Payable

No opinion can be expressed as to whether the valuation of accounts receivable and payable shown in the Balance Sheet is realistic for the following reasons.

- (a) None of the debtors and deposits balances totalling Rs. 1,685,950 and Rs. 242,215 respectively had been confirmed.
- (b) Advances for supplies and services outstanding as at the end of the year under review amounted to Rs. 1,635,936. This included a sum of Rs. 1,226,226 outstanding for periods ranging from one to five years.
- (c) The provision of Rs.348,659 made for bad debts was not considered adequate in view of the magnitude of the long outstanding debts.
- (d) Salary advances and travelling advances outstanding as at the end of the year under review amounted to Rs.62,163 including Rs.45,686 outstanding for periods ranging from one to three years.
- (e) Petty cash advances given to the staff in 1991 totalling Rs. 188,478 had not been settled upto the end of the year 1993.
- (f) Out of debtors balances of Rs. 1,685,951 debts amounting to Rs. 1,219,520 were outstanding for periods ranging from one to five years.

Contd...11/-

- 11 -

- (g) Confirmations of balances had not been received in respect of any of the 183 creditors whose balances aggregated Rs.12,612,596.
- (h) Creditors' balances amounting to Rs.2,847,331 and Rs.2,923,535 were outstanding for periods ranging from one to five years and over five years respectively.
- (i) Project creditors balances amounting to Rs.1,550,691 and Rs.1,148,838 were outstanding for periods ranging from one to three years and over three years respectively.

2:5:7 Lack of Evidence for Audit

The following items in the accounts could not be satisfactorily vouched or accepted in audit due to lack of evidence indicated against each item.

Item	Value	Evidence not <u>made available</u>
	<u>Rs.</u>	
(a) Fixed Assets	102,087,545	(i) Fixed Assets Register (ii) Vehicle Files (iii) Verification Reports.
(b) Repairs and Maintenance	Not ascertained	Registers indicating the mileage done, repair costs, etc.
(c) Travelling advances	25,220	Schedules and Advances Register
(d) Motor Vehicle and Running expenses	Not ascertained	Daily running charts relating to certain vehicles, fuel consumption and fuel bills.
(e) Debtors	1,685,951	Confirmations

(f) (i)	Advances	1,685,936)	
(ii)	Bank Balances	3,346,142)	
(iii)	Creditors and accrued expenses	7,459,965)) Confirmations
(iv)	Project Creditors	3,278,771)	
(g)	Sundry Creditors	287,681)) Detailed Schedules
	Unclaimed Consultancy Fees	15,028)	
(h)	Utilization of Government Grants.		
(i)	Recurrent	17,500,000)) Votes Ledger
(ii)	Capital	10,525,000)	

Contd...13/-

2:5:8 Non-compliance with Laws, Rules, Regulations, Management Decisions etc.

Instances of non-compliance with laws, rules, regulations etc. observed in audit are given below.

<u>Reference to Laws, Rules, Regulations, Management Decisions etc.</u>	<u>Particulars</u>
(a) Finance Act: Section 12	Approval of the relevant Ministers had not been obtained for the form and content of the accounts.
Section 13(5)(b)	Reports had not been furnished to the Auditor General as specified by him.
Section 13(6)	Report on accounts as specified by the Auditor General had not been furnished along with the accounts.
Section 14(1)	A copy of the draft annual report had not been submitted within 04 months after the end of the financial year.
Section 14(3)	Annual report on accounts for the year 1991 had not been tabled in Parliament as at the end of 30 November 1993.
(b) National Aquatic Resources Research and Development Agency Act No. 54 of 1981 Section 5(13)	National Aquatic Resources Management Council had not been formed.

Section 5(17)

Technical and Scientific Standing Committee had not been formed.

(c) Manual of Procedure
Para 4 and 6(2)

Inordinate delays were observed in the banking of daily collections.

(d) Board Decision,
Reference No. 136

A committee had not been appointed to revise existing manual of procedures as required by the Board of Directors.

2:5:9 Application of specific Funds.

According to the accounts presented, the total receipts and disbursement under Federal Republic of Germany (FRG) Project during the year under review are given below.

	<u>Receipts</u>	<u>Disbursement</u>
	Rs.	Rs.
Treasury Grant	3,300,000	3,300,000
Foreign Aid	<u>8,338,000</u>	<u>8,338,000</u>
Total	<u>11,638,000</u>	<u>11,638,000</u>
	=====	=====

The objectives of the Project are to provide assistance to the Hydrographic Service with a view to raising the contribution made by hydrography in the management of aquatic resources and maritime shipping.

Of the Treasury Grant of Rs.3,300,000 received a sum of Rs.1,713,899 had been utilised for activities outside the objectives of the Project. A copy of the Agreement dated 18 October 1973 had not been made available for audit though called for.

Contd...15/-

3. Financial and Operating Review

3.1 Financial Results

The working of the Agency during the year ended 31 December 1992 had resulted in a deficit of Rs.8,163,129 compared with the deficit of Rs.7,733,944 for the preceding year.

In view of the material uncertainty reflected in the financial statements as described below, any attempt to analyse this variance is not likely to lead to any meaningful results.

The financial results disclosed in the annual financial statements of the Agency had been adjusted by the Agency for omissions and errors etc. observed in the subsequent years as a regular feature. For instance, the deficit of Rs.7,773,944 shown in the accounts for the previous year had been adjusted during the year under review by Rs.12,317,717. Similar adjustments made during the previous five years are given below.

<u>Year</u>	<u>Financial results</u>	<u>Adjustments made in the subsequent year</u>
	Rs.	Rs.
1986	(4,538,360)	(8,326,598)
1987	(3,858,065)	(37,962)
1988	(6,335,458)	(1,058,134)
1989	(6,129,198)	475,250
1990	(8,715,370)	(1,724,142)

In this context, the possibility of similar adjustments of the financial results and the financial position for the year under review in subsequent years cannot be ruled out. Therefore, no reliance can be placed on the financial results and on the financial position reflected in the accounts.

3:2 Idle Resources

5 motor vehicles, 15 boats, sports room and some building space remained idle during the year under review. Suitable action had not been taken by the Agency to utilise these resources or to take appropriate alternative course of action. These resources were idling for periods ranging from one to eight years.

3.3 Uneconomic Transactions

Following observations are made:

- (a) A sum of Rs.171,616 had been paid as salaries to the crew of the vessel "Samudra Maru" although the vessel had been idling for the entire year pending an overhaul.
- (b) Certain vehicles belonging to the Agency had been used by the Ministry of Fisheries. The running and maintenance expenses so incurred had not been recovered from the Ministry.

3.4 Repairs and Maintenance of Research Vessel "Samudra Maru"

The research vessel "Samudra Maru" handed over by the Ministry of Fisheries in February 1985 remained inoperative with a crew of 9 during the year under review too.

Following observations are made:

- (a) A total sum of Rs.5,559,359 had been incurred on repairs and maintenance during the 05 years ending 31 December 1991.
- (b) A sum of Rs.2,003,073 had been spent for repairs and maintenance during the year.
- (c) The cost of spare parts purchased by CRDP amounted to Rs.19,999,500.
- (d) The annual cost of salaries of the crew of the vessel amounted to Rs. 171,616.

Contd...17/-

3:5 Cost of Personnel

A comparative statement of cost of personnel for the year 1991 and 1992 analysed under each category is given below:

	<u>No. of Employees</u>		<u>Average cost per Employee</u>	
	<u>1992</u>	<u>1991</u>	<u>1992</u>	<u>1991</u>
			Rs.	Rs.
Executive	45	85	59,500	47,829
Non-executive	<u>142</u>	<u>132</u>	47,946	38,381
	187	217	50,727	47,303
	===	===		

3:6 Vehicle Utilization

The Agency had a fleet of 33 vehicles as at the end of the year under review. The total cost of running and maintenance of this fleet during the year under review could not be ascertained in the absence of proper accounting records showing these expenses under separate headings. The total cost of fuel of this fleet during the year under review was Rs.1,035,402 compared with Rs.840,538 during the previous year. It was also observed that the running charts and log books had not been properly maintained for individual vehicles indicating the distance travelled, fuel consumed, repair cost, etc. Hence, it was not possible to determine the cost of fuel consumed by each vehicle, the overall average performance per litre nor the cost of repairs per vehicle.

Contd...18/-

3:7 Budgetary Control


Significant Variations were observed between the budget and the actual income and expenditure during the year under review thus indicating that the budget had not been made use of as an effective tool of management control.

4. Systems and Controls

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

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

- (a) Delegation and segregation of financial authority
- (b) Advances for purchases
- (c) Debtors and Creditors
- (d) Petty Cash
- (e) Fixed Assets
- (f) Control Accounts
- (g) Review of Operation and records by the Internal Audit
- (h) Vehicles
- (i) Bank Reconciliations
- (j) Salaries


(S.M. Sabry)
Auditor General

nw/

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