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## REPORT ON NAREPP INDICATORS

Prepared by

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A Project of the United States Agency for International Development and the Government of Sri Lanka

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## INTRODUCTION

NAREPP has contributed significantly to increasing environmental awareness in both the private and public sector, setting training courses in environmental impact assessments and environmental audits, assisting to develop capabilities in key institutions. Objective 6.1 in the 1993 NAREPP/IRG Consolidated Work Plan states:

"6.1 Objective - Establish/promulgate indicators for environmental conditions and trends and NAREPP.

Tasks: ...

- b. Identify key indicators and obtain/analyze necessary data...

Output:...

- b. Indicators on environmental conditions/trends, NAREPP indicators."

This report serves to assess the 5 indicators selected by USAID and NAREPP in order to quantify the contributions of NAREPP to the environment. The 5 indicators and a summary of the status of each indicator are listed below. Following the summary, each indicator is discussed separately in detail with baseline conditions, if available, as well as the current status of the indicator. Suggestions are made to improve the indicator to assist future assessment of NAREPP activities.

## SUMMARY OF INDICATOR AND STATUS

Indicator 1. Implementation of water pollution management that reduces the rate of increase in domestic, industrial, and agricultural pollution, as measured by ambient water quality of selected water bodies.

Status: The IFS water quality study commenced in June 1993 and sufficient data to assess NAREPP impact have not yet been collected. In order to collect statistically significant long-term water quality data, this study should be funded for a minimum of 5 years, then reassessed for further data collection.

Indicator 2. Percentage of new investments subject to EIA requirements that have substantially complied with EIA recommendations.

Status: The number of EIAs has increased since the inception of NAREPP (see indicator 6). However, compliance with EIA recommendations are difficult to track and are not monitored. Suggested changes to the indicator include to make EIA recommendations part of the Environmental Protection License conditions which should increase enforcement of conditions and assist in monitoring.

Indicator 3. Percentage of the general public involved in environmental issues.

Status: The baseline survey for this indicator was commissioned by NAREPP and completed in May 1993 at which time about 40% of the urban and 35% of the rural surveyed population indicated involvement in environmental actions. Follow-up surveys should be conducted in 1995. Suggested changes to this indicator include questions regarding the importance of environmental issues at a national level and assessment of the seriousness of environmental issues to the population.

Indicator 4. Number of environmental contracts signed by Sri Lankan environmental consulting firms.

Status: Fifteen private, Sri Lankan consulting companies were surveyed regarding the number and type of projects that they have conducted in each calendar year since 1990. The number of projects has increased from 58 in 1990 to approximately 177 in 1993. In addition, the number of consulting firms has been increasing in the last 5 years. Follow-up survey should be conducted at the end of 1995 to assess further growth in the number of projects and the number of consulting firms.

Indicator 5. Percentage of National Environmental Action Plan (NEAP) recommendations initiated by the Government of Sri Lanka.

Status: Some activities of NEAP are in progress but there is no central body tracking implementation of NEAP recommendations. However, the NEAP is currently undergoing significant revision and update. In addition, a NEAP Secretariat is being formed which should assist in tracking of this indicator. It is suggested that the indicator be maintained and data collected from the NEAP Secretariat be used to monitor this indicator.

In addition to the five indicators listed above, the following has been added for one-time consideration:

Indicator 6. Number of EIAs prepared before and after the inception of NAREPP in August 1991.

Status: 4 studies/EIAs were conducted prior to August 1991 which was the inception of NAREPP. Since then, 8 EIAs have been completed and 15 EIAs are in progress. This indicator does not need to be tracked in the future.

## DETAILED STATUS AND DISCUSSION

Indicator 1. Implementation of water pollution management that reduces the rate of increase in domestic, industrial, and agricultural pollution, as measured by ambient water quality of selected water bodies.

This indicator is important to assess the baseline water quality as well as future changes in water quality in key water bodies in Sri Lanka. This indicator is being tracked through a study commissioned by USAID through NAREPP/IRG and conducted by the Institute for Fundamental Studies (IFS) in Kandy. The IFS has been monitoring water quality in 10 water bodies in Sri Lanka since June 1993. The water quality data will establish a baseline of information as well as to track changes in water quality over time. The reports will require analysis of changes with respect to precipitation, and other factors to determine whether the rate of increase of pollution is indeed being reduced. The study will have to be continued over the long-term in order to be able to draw statistically significant conclusions regarding the data collected. It is suggested that data collection and analysis take place for at least 5 years with the opportunity to continue for additional years after a review of the data. Continued tracking of this indicator can be accomplished through continued funding of the IFS study.

Indicator 2. Percentage of new investments subject to EIA requirements that have substantially complied with EIA recommendations.

This indicator is important to assess the impact of EIA preparation, which has been a NAREPP focus activity, on the project as it is actually implemented, not just as the project is being planned. At present, there is no formal mechanism within the Central Environmental Authority (CEA) to track compliance with the EIA recommendations. It should be noted that post-environmental assessment monitoring of projects does not explicitly occur in the United States either. In the U.S., conditions placed on a project as a result of preparation of an environmental document are often specified as conditions in operating permits issued by the appropriate authorities. This may be an appropriate model for Sri Lanka to follow as well.

A compliance assessment program for EIA recommendations was developed which included training of CEA staff. However, the program was not fully implemented because of a lack of time. The assessment program included review of the EIA and identification of the recommendations, discussion with the project proponent regarding measures to be taken to implement the recommendations and field visit to verify implementation of the measures. Continued tracking of this indicator is time-consuming and difficult given the current NAREPP staffing. If CEA has not already done so, they should develop the mechanisms so that EIA recommendations are incorporated into Environmental Protection Licenses (EPL) as conditions. By linking the EIA to the EPL, an additional means of enforcing EIA conditions is implemented.

Therefore, it is suggested that this indicator be modified to state:

"The percentage of new investments subject to EIA requirements that have environmental protection licenses that contain EIA recommendations."

The indicator should be tracked by the CEA and the information could be transmitted to NAREPP quarterly. With this modification, the indicator is easier to track and provides CEA with a better mechanism for enforcing EIA recommendations.

Indicator 3. Percentage of the general public involved in environmental issues.

This indicator is important to gauge the public's response to the environmental issues raised by NAREPP. However, it is difficult to assess given the various definitions of "involved" and "issues". In order to better assess these parameters, NAREPP commissioned Survey Lanka to conduct an environmental awareness survey of 2,000 urban and 2,000 rural residents in early 1993. The summary report produced in June 1993 indicates that at a local level, environmental issues are a high concern for both rural and urban residents. However, at a national level, environment ranks fifth behind cost of living, ethnic conflict, unemployment and costs of housing and land.

The NAREPP indicator suggests that three of the questions asked in the survey should be used to monitor the percentage of people involved in environmental issues. The survey asked open-ended, non-specific questions regarding the environment in the context of other issues. As such, it is difficult to use the results to determine the percentage of general public involved in environmental issues. It may also be difficult to use the 1993 survey as the baseline for future surveys.

Given the above difficulties exist, it is suggested that the three questions or issues to be monitored in future surveys include:

1. The level of awareness of the environment as a national problem. In the 1993 survey, environment was ranked the fifth most pressing issue.
2. The level of seriousness of environmental problems facing Sri Lanka. In the 1993 survey, about half of the urban population perceived environmental problems as "extremely" or "very serious" while about 40 percent of the rural population saw environmental problems as "extremely" or "very serious".
3. The percentage of the surveyed population that has participated in an action aimed at solving/preventing an environmental problem. In the 1993 survey nearly 40 percent of the urban and 35 percent of the rural population participated in activities such as clean-ups and tree plantings.

In order for valid comparisons to be made regarding this 1993 baseline survey and any future surveys, it is important that the same survey be conducted to a similar or larger sample size. At a minimum, the questions that will be tracked over a period of time need to be the same, and asked in the same manner.

I recommend that the indicator be rephrased to reflect the questions or issues that are

being monitored by the survey as follows:

"Environmental awareness in the public should be indicated by response to a survey which assesses:

1. Environment as a pressing issue on the national agenda;
2. The seriousness of environmental problems facing Sri Lanka; and
3. The percentage of the surveyed population that has participated in an action aimed at solving/preventing an environmental problem."

Indicator 4. Number of environmental contracts signed by Sri Lankan environmental consulting firms.

This indicator provides information on the level of activity in environmental issues within the private sector. Data were collected to assess this indicator by contacting the twenty private-sector consultants shown on Table 1 by letter and telephone, where possible. Each consultant was asked to complete the questionnaire shown in Appendix A. The twenty consultants were selected for the survey because they were registered with the Central Environmental Authority and were known to the local staff to actively work on environmental projects. Public-sector entities which provided consulting services such as the National Building Research Organization and the Ceylon Institute of Scientific and Industrial Research were not included in the survey because of the focus on organizations which are not supported by public funds. Table 1 also indicates the fifteen companies that responded to the questionnaire.

The questionnaire was intended to draw out the wide variety of activities that could be termed "environmental" such as environmental impact assessment, wetlands restoration, erosion and drainage control, environmental audit, and pollution control. In addition, each company was asked to include any other activities that do not specifically appear on the questionnaire. The consultants added eight other activities to the original list of twenty-one items on the questionnaire.

As can be seen in the summary of the responses from the fifteen companies shown on Table 2, the number of projects contracted by these consultants has been increasing over time. Figure 1 shows the increase in projects from 58 in 1990 through to approximately 177 in 1993. The total number for 1993 is extrapolated from the number of projects for the first seven months of the year. The increase in the number of projects can be attributed to the passage of the National Environmental Act and NAREPP's assistance in enforcement and compliance with the act.

In addition, questions were asked regarding the length of time that a consultant had been in operation as compared to the inception of NAREPP. As shown on Figure 2, nearly two-thirds of the consulting firms have come into operation in the last 10 years while 40 percent have started operation in the last 5 years. It is apparent that there is an increased awareness and need for assistance in addressing environmental issues that the new consulting firms seek to fill.

The suggested follow-up to this indicator is to survey and/or interview the same consultants in 1995 for the number of projects conducted in 1993 and 1994 as well as adding in the consultants which have come into practice since 1993 as recorded by the CEA. Once accreditation of environmental laboratories and consultants becomes common practice, the rosters of accredited consultants can be used. Once environmental consulting becomes firmly entrenched in Sri Lankan business, there will be no need to continue this type of survey as an indicator.

Indicator 5. Percentage of National Environmental Action Plan (NEAP) recommendations initiated by the Government of Sri Lanka.

This indicator is important because it assesses the Government of Sri Lanka's commitment to implementing actions that directly benefit the environment. The NEAP is undergoing revision and update at the present time and should be completed in March 1994. The Updated NEAP has divided the environmental issues into six sectors which are:

1. Policies, Institutions, Education and Culture
2. Land and Water Resources
3. Forest and Bio-diversity Conservation
4. Urban and Industrial Pollution
5. Coastal and Marine Resources
6. Energy and Mineral Resources

The NEAP update will identify priorities of the sectors and will develop specific policy reforms and sub-projects which have specific Government of Sri Lanka agencies associated with each policy or sub-project. The policy reforms will be undertaken by the Parliament, specific Ministries, and/or agencies. Some sub-projects will be funded by the World Bank while others will be open for assistance by other donor agencies. The NEAP includes the activities that are already underway by the Government of Sri Lanka. As part of the NEAP update, the Ministry of Environment and Parliamentary Affairs has developed a NEAP Secretariat which will coordinate the update activities at the present time and hopes to monitor projects and policy changes in the future.

The structure for the NEAP (October 1991) and the lack of a central implementing body for the NEAP made tracking of implementation of the NEAP recommendations difficult. However, the updated NEAP and the new NEAP Secretariat should assist in tracking the progress of the NEAP recommendations. Therefore, this indicator can remain as is, and should use the information collected by the NEAP Secretariat to update and monitor this indicator.

Table 1 - Sri Lankan Consultants Contacted for Response to Questionnaire

Name	Contact	Phone	Address	Responded to Questionnaire?	No. of Years in business
Devenco	Mr. S. Wijesundara	565269	138, Old Road, Nawala	yes	7 years
Lanka Consultants	Mr. W. Weerasooriya, Director	714289	14/8 Rajamahavihara Rd, Kotte	yes	unknown
Ranimpex Env. Engr. Svcs.	Mr. Ravi Jayananda	850724, fax 696064	24 Temple Road, Maharagama	yes	2 years
Env. Lab. Ltd.	Mr. Nihal DeSilva, Mg. Dir. Ms. Roberta Kaluarachichi	851070,1 851069 Fax 851198	135/1 Old Kottawa Rd, Navinna, Maharagama	yes	14 years
Engineering Consultants Ltd	Mr. C.C.T. Fernando/Mr. Gomez	573573, 574154, 575512, 573451, 574054	60 Dharmapala Mawatha, Col. 3	yes	25 years
Teams	Mr. Abeysinghe	686429	55 Rosemead Place, Col. 7	yes	6 years
RDC	Ms. Tania Weerasooriya	435746	55 2/1 Galle Road, Col. 3	yes	17 years
Lanka Asian Mgmt. Co	Mr. Mahendran, Gen. Dir.	437437	Rm 341, Lanka Oberoi Hotel, Col. 3	yes	1 year
Hydro Systems Int'l	Mr. Tissa Meepe	854827, 699706	121B Madiwela Rd, Udahamulla, Nugegoda	yes	3 years
Energy Consult (Pvt.)Ltd	Mr. T. Daranagama & Mr. M. Seneviratne		17 Rheinland Place, Col. 3	no	unknown
Sunpower Systems (Pvt)Ltd	Mr. Viraj Perera	696871	330 T.B. Jaya Maw., Col. 10	yes	5 years

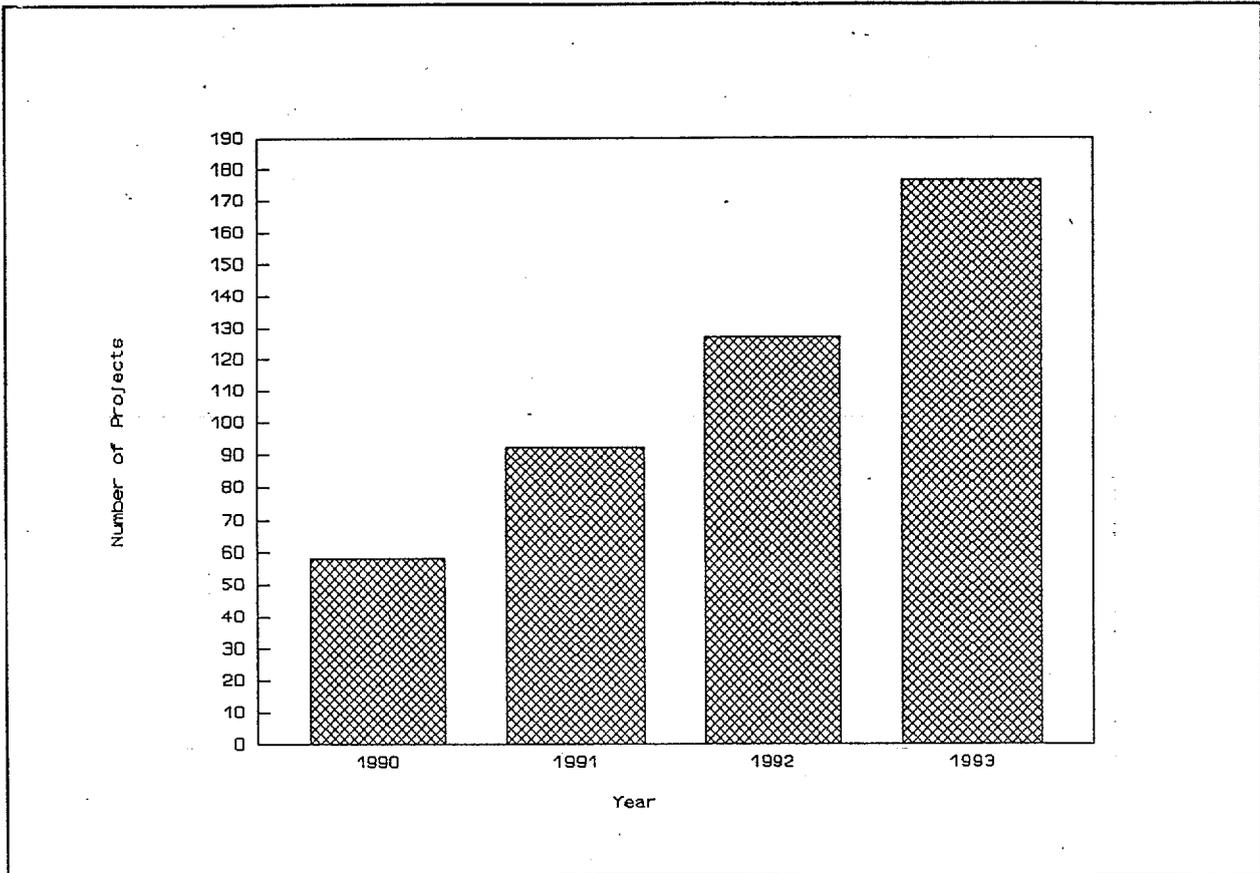
Name	Contact	Phone	Address	Responded to Questionnaire?	No. of Years in business
Nihal Rajapakse Cons. Engrs.	Mr. Nihal Rajapakse	585458	No. 29 Milagiriya Avenue, Col. 4	yes	6 years
Tech Waters (Pvt) Ltd.	Mr. Nalin Kamaragoda	853752	303 High Level Road, Col. 5	no	unknown
Lanka Hydraulics Ltd.	Mr. Amarasinghe, Mr. H.J.M. Wickremaratne	507472,3, 507470, 505409	177 John Rodrigo Mawatha, Moratuwa	yes	8 years
Assoc. Engr. Consultants	Mr. Munasinghe	727275	30 1/1 1st fl. Sri Saranankara Maw., Dehiwela	no	unknown
Environmental Engr. Consul.	Mr. Sundaralingam	714846, 712158	5 Council Lane, Dehiwela	no	15 years
Waterman Engineering (Pvt)	Mr. Anura Balasooriya	716810	124/5 Dudley Senanayake Ave., Dehiwela	yes	3 years
The Consultancy Consortium	Mr. Wijeratne	714269	47A Indrajothi Mawatha, Ratmalana	yes	2 years
Lanka Enviro-Engineers	Mr. Wijeratne	714269	47A Indrajothi Maw., Ratmalana	yes	13 years
Aqua Resource Systems	Mr. P.M.V.P. De Silva	08-22664, 078 71085	357 Peredeniya Road, Kandy	no	unknown

Table 2 - Summary of Responses to Questionnaires by 15 Private Consulting Firms

Project Type	No. of Projects for Calendar Year:			
	1990	1991	1992	1993
Environmental Impact Assessment	2	7	13	5
Environmental Audit of Industry				
Wastewater Collection, Treatment and Disposal (Domestic and Industrial)	8	15	32	56
Advanced Wastewater Treatment (e.g. reverse osmosis, ion-exchange, water softening etc.)	8	9	14	7
Industrial Process Improvements			3	1
Solid Waste Management and Waste Minimization		1	4	4
Drainage Improvements and Control	4	4	7	6
Erosion Control	7	10	6	2
Land-use Management	4	6	6	2
Irrigation Management	7	6	9	1
Air Pollution Monitoring and Control		1	2	
Hazardous Waste Management				2
Infectious (Hospital) Waste Control				1
Toxic Substances in the Environment				
Water Quality studies	8	13	9	6
Coastal Zone Management Projects	1	2		1
Wildlife Management		3	1	1
Wetlands Survey/Restoration			1	
Energy Audit		1	1	
Reforestation		3		
Geographic Information Systems		1	1	
Alternative Energy			1	2
Hard Water Treatment/Water Softening			2	1
Fire-fighting				1
Energy Recycling			2	
Coastal Engineering	6	8	8	4
Environmental Profile			1	
Bio-diversity		1	1	
Impact on Human Settlements	3	1	3	
Total per year	58	92	127	177*

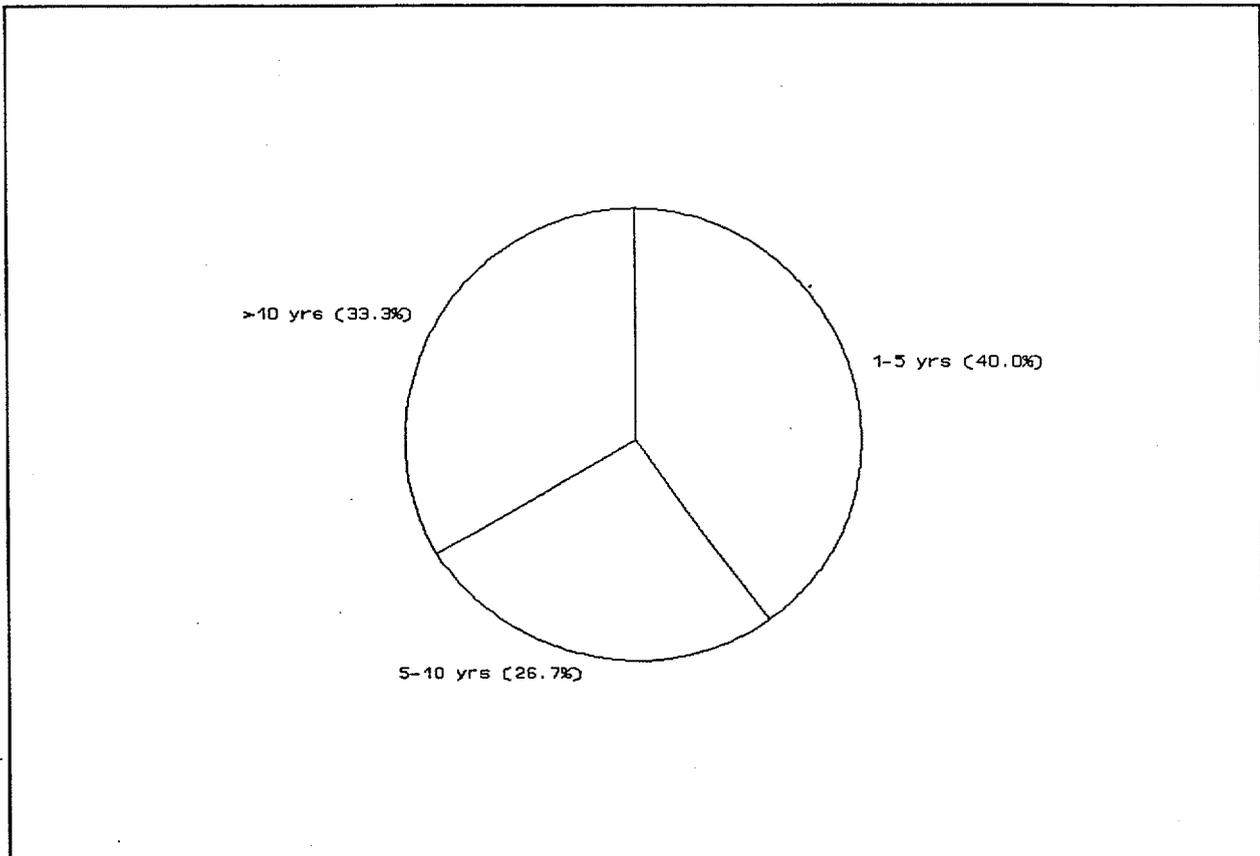
\* Results extrapolated from first seven months of 1993 where total number of projects was 103.

Figure 1 - Environmental Projects Contracted by Sri Lankan Consultants



1993 results extrapolated from number of projects for first seven months.

Figure 2 - Number of Sri Lankan Consultants in Business by Length of Operation



**Indicator 6.** Number of EIAs prepared before and after the inception of NAREPP in August 1991.

This indicator is related to Indicator 2 and is a useful indicator of NAREPP's involvement in assistance for preparation of EIAs. The projects for which EIAs have been conducted or are in process were obtained from the CEA. As can be seen in Table 3, there were 4 studies that could be considered to be analogous to an EIA that were conducted before August 1991, the inception of NAREPP. Since August 1991 to the present, there have been 8 EIAs completed and approved (Table 4) with another 15 EIAs in progress (Table 5). NAREPP's assistance in implementation of the EIA regulations found under the National Environmental Act are apparent.

Table 3 - EIA's Completed before August 1991 (NAREPP Inception)

Project	Description	Status
1. Trincomalee Power Plant	New 300 MW Coal Power Plant	EIA under review.
2. Hikkaduwa Env'l Study	Study of Environmental conditions in Hikkaduwa	No formal review undertaken.
3. Mahaweli Assessment		No formal review undertaken.
4. Carson's Aquaculture Project	Prawn culture project	No formal review undertaken.

Table 4 - EIA's Completed and Approved since August 1991 to present

Project	Description	Status
1. Kalu Ganga Mechanized Gem Mining Project	Proposed hydraulic gem mining on 35 km stretch of Kalu Ganga	NAREPP assisted interagency GOSL EIA team. EIA completed. GOSL denied project.
2. Kandalama Hotel Project	100 room hotel at eastern side of Kandalama tank with expansion to 150 rooms	EIA approved. Project construction underway.
3. Aqua Gardens Ltd. Aquaculture Project (Bangadeniya)	150 acre tiger prawn farming project	EIA approved. Project is under construction.
4. France Ceylon Aquaculture Project (Manativu)	Tiger prawn farming project	EIA approved. Project not yet under construction.
5. Kirinda Harbour Rehabilitation Project	Harbour finished in 1985 but has since silted in. New project for rehabilitation of harbour.	EIA approved. Project is under construction.
6. Menik Ganga Diversion Project	3.8m high weir across Menik Ganga and 17 km concrete canal.	EIA approved.
7. Sapugaskanda Power Station Expansion Project	Expansion of Sapugaskanda thermal plant by 40 MW	EIA approved.
8. Koggala Free Trade Zone	Free trade zone for export industries	EIA approved. Project is completed.

Table 5 - EIA's Under Evaluation or Preparation since August 1991 to present

Project	Description	Status
1. Kaluganga Reservoir and Extension Agricultural Scheme	Dam across Kaluganga a tributary of Ambanganga.	EIA under preparation.
2. Colombo-Katunayake Expressway	Expressway from Colombo port across new Kelani bridge to Katunayake Airport.	EIA completed. Evaluation in process. Available for public review. EIA team will respond
3. Wastewater Treatment and Disposal for Koggala Free Trade Zone	Wastewater Treatment and Disposal alternatives including outfall pipe to the continental shelf break.	TOR completed. EIA under preparation. NAREPP will provide TA to BOI (GCEC) to prepare EIA.
4. Kukule Ganga Hydro Power Project	6 project alternatives proposed in Conceptual Design Report	NAREPP assisted with TOR. EIA completed. Available for public review.
5. Upper Kotmale Hydro Development Project	Located below the Kotmale reservoir, around upper catchment areas.	EIA under preparation.
6. Muthurajawela Large Scale Reclamation Project	The 400 acre Muthurajawela Marsh-Negombo Lagoon extends for 30 km from N. of Colombo to Negombo town.	TOR completed and given. Study not yet underway.
7. Walawe Upgrading & Extension Project - Udawalawe	Extension and rehabilitation of irrigation project	NAREPP made recommendations on format, key issues. EIA completed. Evaluation in process
8. Sapugaskanda Power Station New Project	Location of new 40 MW diesel plant.	TOR completed.
9. Rajawela Golf & Hotel Project - Digana	517 acre development with 2 golf courses, marina, water sports, and hotels	NAREPP provided TA. Draft EIA completed. Evaluation by CEA in process.
10. Matara-Kataragama Railway Extension Project	110 km extension of Matara railway line	NAREPP assisted SLGR EA team. EIA completed and is in review.
11. Yan Oya Project	Diversion of Yan Oya waters to the Padaviya reservoir located in the North Central Province.	TOR under preparation.
12. Wirawila Sanctuary Hotel (Hambantota)	Proposed hotel	TOR prepared.
13. Mahara Landfill	Proposed sanitary solid waste landfill at Mahara/Kadawata	TOR under preparation.
14. Oberoi Hantana Hotel - Kandy	Proposed 150-room hotel	EIA under preparation.
15. John Keels Hotel - Nuwara Eliya	Proposed 150-room hotel	EIA under preparation.

## APPENDIX A: Questionnaire Sent to Twenty Sri Lankan Private Consultants

Please complete the table below as completely as possible. Projects should only be listed once in the most specific and applicable category possible and for the most applicable time frame possible.

Project Type	Is this service offered by your company?	No. of Projects for Calendar Year:			
		1990	1991	1992	1993
Environmental Impact Assessment					
Environmental Audit of Industry					
Wastewater Collection, Treatment and Disposal (Domestic and Industrial)					
Advanced Wastewater Treatment (e.g. reverse osmosis, ion-exchange, etc.)					
Industrial Process Improvements					
Solid Waste Management and Waste Minimization					
Drainage Improvements and Control					
Erosion Control					
Land-use Management					
Irrigation Management					
Air Pollution Monitoring and Control					
Hazardous Waste Management					
Infectious (Hospital) Waste Control					
Toxic Substances in the Environment					
Water Quality studies					
Coastal Zone Management Projects					
Wildlife Management					
Wetlands Survey/Restoration					
Energy Audit					
Reforestation					
Geographic Information Systems					
Other (Please describe)					

What percentage of the funding for your projects comes from:

Foreign donors	_____ %
Private industry	_____ %
Government Institutions	_____ %
Other	_____ %

What are the top three areas in the environmental field where you expect to see your business grow in the next five years?

1.  
\_\_\_\_\_
2.  
\_\_\_\_\_
3.  
\_\_\_\_\_

If your firm does EIA's, what are the key data needs that your firm requires to complete EIA's (e.g. land-use, water quality, flora and fauna, hydrology, etc)? Are you able to locate data when you need it? What are the problems that you have with acquiring data?

How long has your company been in business?

How many full-time permanent employees do you have?

Other Comments:

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Consulting Firm: \_\_\_\_\_