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TRAVEL REPORT

A study on environmental
technology projects and
possibilities in Sri Lanka
and Bangladesh

NIVA - REPORT

Norwegian Institute for Water Research  NIVA

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Abstract: NIVA intends to increase its involvement in south-east Asia. In addition to the advanced knowledge in environmental technology, this requires an understanding of the local conditions, procedures and a knowledge on adopted technologies. This travel report presents the summaries of various meetings NIVA had with local authorities and institutions in Sri Lanka and Bangladesh. The report presents information on relevant projects, authorities and procedures as a preliminary study for NIVA's future engagement.

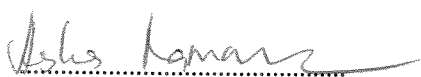
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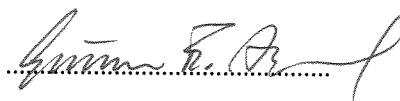
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Project manager



Harsha Ratnaweera

For the Administration



Gunnar Fr. Aasgaard

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Preface

The importance of the active engagement from industrialised countries in environmental problems in developing countries is now significant. In addition to the advanced knowledge in environmental technology, this requires an understanding of the local conditions, procedures and knowledge on the adopted technology. Among other Norwegian institutions, Norwegian Institute for Water Research (NIVA) intends to advance its competence in this field.

In 1994, NIVA was granted a project by the Norwegian Research Council's (NFR) program for development of foreign-aid related competence (Program for bistandsrelevant kompetanseoppbygging) to undertake a study on environmental technology projects and possibilities in Sri Lanka and Bangladesh. The project summary is presented in this travel report through the summaries of various meetings conducted in Sri Lanka and in Bangladesh.

We would like to extend our thanks to all those who helped us in various ways in Sri Lanka and Bangladesh. The NORAD representatives in the two countries, especially Ms Berit Fladby in Bangladesh, deserve special thanks.

*Harsha Ratnaweera
Gunnar Fr. Aasgaard
October, 1994.*

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1. Background

NIVA, as the national centre for water research in Norway, has been involved in a number of projects in developing countries. Most of these projects were financed by the Norwegian authorities. With the increase of the environmental awareness during the last decade, both the interest and the requirement for development projects in environmental technology has increased significantly in developing countries. Therefore, the division of environmental technology at NIVA has decided to learn more about such possibilities in selected areas.

In comparison to Norway's financial contribution to the developing world, and in comparison to the involvement of the other industrialised countries in development projects, the Norwegian institutions have a relatively low engagement in such projects. To improve this situation, the Norwegian authorities have identified the need for development of awareness and expertise among Norwegian scientists and engineers relevant to applications in developing countries. For this purpose, the research program for development of foreign-aid related competence (Program for bistandsrelevant kompetanseoppbygging) is administrated by the Norwegian Research Council.

In 1993 NIVA was granted a project to study the wastewater treatment and management alternatives to secure hygienic drinking water quality in remote areas in Sri Lanka. The project was a preliminary study, and resulted in the insight of many environmental problems. In 1993, NIVA was also engaged on the World Bank financed project for the Sri Lankan National Environmental Action Plan (NEAP) project preparation, which also gave a better understanding of the environmental problems in the country. These two issues and the NIVA's intention to actively involve in environmental projects in the south-east Asia has resulted in the current project, which is reported here.

The current project was planned to investigate the environmental projects and possibilities in Sri Lanka. Considering the geographic and social similarities, Bangladesh was selected as the second country for such an investigation. The Norwegian Research Council granted 50% of the expenses for this project through the above mentioned program, while NIVA financed the rest.

The project summary is presented in this travel report through the summaries of various meetings conducted in Sri Lanka and in Bangladesh.

2. Project Goals

Title: A Study on Environmental Technology Projects and Possibilities in Sri Lanka and Bangladesh.

Project Goals:

- to learn about on-going environmental projects
- to learn about important environmental issues for NIVA's engagement
- to learn about involvement of international donor organisations in environmental projects
- to learn about the authorities dealing with water and wastewater issues, and to get an idea about procedures for project preparation
- to establish contact with local consulting firms.

3. Project group and Working plan

Project group:

Research Scientist Harsha Ratnaweera, Ph.D., (Project manager)
Research Director Gunnar Fr. Aasgaard, M.Sc.

Working plan:

Phase-1: Planning of visits and preliminary contacts with Sri Lankan and Bangladesh authorities. Study of relevant literature. (2 weeks)

Phase-2: Visit to Sri Lanka and Bangladesh. Meetings with relevant authorities (2 weeks)

Phase-3: Report writing and meetings in Norway.

4. Visited Institutions and Companies

4.1 In Sri Lanka

11 meetings during 4-9 + 18 July 1994

NORAD Colombo, Resident Representative
Environmental Consultants Ltd (ECL) 2 Directors
Central Environmental Authority (CEA) (=SFT), Dir. Gen.
National Water Supply & Drainage Board, Dep. Gen. Manager
National Development Bank (NDB), Manager
Ministry of Science, Technology and Industries. Director.
Metropolitan Env. Improvement Plan (MEIP), Co-ordinator
Environmental Laboratories Ltd (ELL), Managing Director
Bamber and Bruce Ltd (BBL), Managing Director
Inst. of Fundamental Sciences (IFS) Dept. Head, Director.
International Federation of Red Cross, Head of delegation
+
Several visits to rural areas.

4.2 In Bangladesh

15 meetings with 10 institutions during 11-15 Juli 1994

NORAD, Dhaka, Actg. Resident Representative (x3)
Ministry of Environment & Forestry, Deputy secretary
Resource Control Company, Managing Director, (x2)
Department of Environment, Director General/DDG, (x2)
Bangladesh Water Development Board, Chairman.
Bangladesh U. of Engineering and Technology, 2 professors
International Union for Conservation of Nature, Res. Rep.
Dhaka Water and Sew. Board, Chairman & Chief Engineer (x2)
Asian Development Bank (ADB), Project Officer
Bangladesh Centre for Advanced Studies, Managing Director
+
2 Technical visits:
Dhaka Domestic WWTP, Plant Superintendent
Visit to Hazaribag Industrial area.

4.3 In Thailand

The flight arrangements required an overnight stay in Bangkok. We have used this opportunity to visit the Asian Institute of Technology (AIT) and a visit on the Bangkok's polluted canals.

5. Summary of Meetings

Comparison table with some key figures:

	Bangladesh	India	Sri Lanka
Area, km ²	144.000	3.288.000	64.454
Capital	Dhaka	New Delhi	Colombo
Population	109 mln	865 mln	17 mln
Population increase, pr. year	2,3%	2,1%	1,4%
Life expectancy at birth	52,8 years	59 years	71 years
Infant mortality	148/1000	115/1000	23/1000
Litrecy	35%	57%	88%
NORAD-aid, NOK mln (% of country's total aid)	235 (2,2%)	123,5 (0,8%)	85,2 (1,5%)

5.1 Meetings in Sri Lanka

SL 1. NORAD Colombo

Mr Per Prestgaard, Resident Representative
Mr W.M.Leelasena, Senior Programme Officer
34, Ward Place, Colombo 7
tlf: +941 698936, fax: +941 695009

NORAD is well aware of the National Environmental Action Plan (NEAP) and the Environmental Action 1 Project (EA1P) of Sri Lanka, which were updated by the Norconsult project team during the end of 1993 and 1994. EA1P is expected to be realised with US\$ 100 mln within 1995-1998, with the co-ordination from the World Bank. The World Bank expects to obtain US\$ 35 mln or more from other donors, and this request has been made to NORAD as well as to others.

Mr Prestgaard stated that the available funds through the NORAD country program is already allocated for ongoing and committed projects, which makes it impossible to support new projects. However, the financing through the Norwegian Industrial Support scheme (næringslivsstøtteordning) would be a possibility, provided suitable projects are identified.

The most suitable financing will be available through the parallel financing scheme. Any project which can be identified as a "development project" at OECD and has external financing of minimum 50% is eligible for support under this scheme. The external financing could be either from governmental resources, institutional financing or financing from other donors like World Bank, ADB etc. The projects may be defined as new projects or extensions of on-going projects. However, these information could be confirmed by Mr Jørn Høystad at the Oslo office. NIVA intends to meet him during the month of October.

Mr Prestgaard would also like to receive a list of interesting and realistic project proposals suitable for NORAD and other Norwegian partners, selected from the NEAP and EA1P. Ratnaweera, who was a member of the EA1P/Norconsult project team, stated that there are several projects where the Norwegian companies and institutions might take part, and agreed

to prepare a list of such projects.

Mr Leelasene mentioned about the forthcoming world conference on low cost technologies on water supply and treatment (title has to be confirmed) which will be held in Sri Lanka at the end of the year, and which will be partially financed by NORAD.

Among the local consulting firms in Sri Lanka, the Environmental Laboratories Ltd was mentioned as a company with "process treatment" activities.

SL 2. Environmental Consultants Ltd (ECL)

Mr Thilaka A. Diyagama, Director/Principal Engineer
Mrs Manel S. Gunawardena, Head - Business development
60, Dharmapala mawatha, Colombo 3
tel: +941 573737 fax: + 941 575514

ECL is an engineering and architectural company with 120 employees. ECL has been the local partner for Norconsult on the NEAP/EA1P project. ECL has a wide experience as the local partner for several international companies, and has a satisfactory working record. In addition to the permanent employees at ECL, several professionals have been employed in projects at times. ECL has also undertaken subcontracts in other countries, and their advantage is high qualified professionals at competitive rates as US\$ 6000 p.m. (when abroad) compared to about US\$ 16000 p.m. for expatriates from industrialised countries.

ECL seemed to have a good contact net among the state agencies and local representatives /expatriates from other international companies in the environmental technology. We have received many valuable information on contact persons, with some of whom we had meetings later.

ECL is very interested to work together with NIVA in Sri Lanka and in the region. All functions of a typical local representative / partner seemed to be available with them.

SL 3. Central Environmental Authority (CEA) (similar to SFT in Norway)

Dr V.U.Ratnayake, Director General
(meeting was arranged by Mr K.G.D. Bandarathilake, DGM, who was attending to a meeting abroad)
Parisara mawatha, Maligawatta new town, Colombo 10.
Tel: +941 421646 fax: +941 810291

A summary of CEA's activities, current problems and aims are well documented in EA1P.

Dr Ratnayake emphasised four industries with potential WW treatment problems:

- textile industry: removal of pigments and colour
- rubber process industry
- tanneries
- fruit juice producing industries

CEA has arranged soft loans for industrial investments in the treatment improvements. All treatment instruments can be imported duty-free. CEA is still not very restrictive on the implementation on regulations on certain areas, especially due to the lack of available/feasible technologies for pollution prevention. Therefore the establishment of demonstration plants are very important.

Dr Ratnayake suggested some authorities and persons we should meet, with whom we had meetings later.

Later we have obtained information that any company intending to work on water and wastewater treatment processes should be registered at CEA. The government has appointed a commission to review the national environmental act, and would accept comments from the public before 31.7.94. Although we have been informed about this and NIVA might have played an active role, the available resources and the time did not permit us to respond to this.

SL 4. National Water Supply and Drainage Board (NWS&DB)

Mr H. Pinidiya, Deputy General Manager, ADB project.

444 C, Galle road, Ratmalana

tel: +941 713817 fax: +941 722329

Oriented on the Asian Development Bank (ADB) project on the rehabilitation of urban water supply scheme. The project was started in 1987 with US\$ 37.5 mln and will be continued with further US\$ 51.2 mln from 1994. The second phase of the project was proposed based on the experiences gained during the last 7 years. However, the environmental aspects are not covered by the current project, while the importance of pollution source identification is understood.

In the second phase of the project, issues on water rights and water conservation will be addressed. This part may also be co-financed with USAID, as a technical assistance program.

Currently funds are available for public educational aspects and for on-job-training. Mot-McDonnell Ltd and Thames Water Ltd are the primary contractors for many of the projects.

Mr Pinidiya is appeared to be an engaged professional. He is concerned about the ground water usage using tube wells, which is at present conducted without any study on the water recharge level, etc. At least 10% of the water supply is wasted (bad housekeeping, leakage etc.) in the country. A former study on the reuse of water has indicated that it is not feasible yet in Sri Lanka.

Identified as an important resource person in any future NIVA activities in Sri Lanka.

SL 5. National Development Bank (NDB)

Mr R.D. Gunapala, Manager, Small and medium industries (SMI) dept.

PO box 1825, No 40, Nawam Mawatha, Colombo 2.

tel: +941 448888 fax: +941 440262

NDB was established in 1979 to assist the private industrial sector. In later years, many loans to the private sector has been administrated by the NDB. The capital for loans are usually obtained from donors like the World Bank, ADB, and other international loans. NDB is also assisting other banks in administration of international donor grants as loans to the private sector.

There are 7600 industries in Sri Lanka, of which 296 are highly polluting the environment (in 1991). 119 of them are located in Colombo/Gampaha district. The two most significant constraints are: the lack of funding and the lack of technical know-how, which result in not satisfactory project results.

NDB and the personal seem to be very keen in assisting the industrial sector with financial assistance on environmental issues. According to the NDB, a new grant and loan system for treatment technologies will be established by the end of 1994. This will be obtained as DEM 6 mln soft loan and DEM 1.5 mln grant by the German government to Sri Lanka. The grant of DEM 1.5 mln is allocated for consultancy services grants. According to this, any industry can apply for a grant of DEM 20 000 as consultancy fees and a loan of DEM 200 000 (or 70 000?) for implementation of pollution abatement purposes. The loans will be given at a 0% real interest with a payback time up to seven years.

USAID wants to establish an environmental account for US\$ 20 mln, at the Secretariat for the Infrastructure Development (SIDE). This is proposed to establish with equal financing from USAID loans, NDB/industry and local banks. The soft loans through this program will be available for water supply, water and wastewaer treatment and for solid waste treatment related issues.

NDB has many proposals and experience on the administration of environmental loans to the private sector. The mixed credit system, etc. under the Norwegian Industrial Support Scheme (nærlingslivsstøtte ordning) will be applicable for this purpose.

SL 6. Ministry of Science, Technology and Industries.

Mr Roy Jayasinghe, Director.

73/1 Galle road, Colombo 3.

tel: +941 447224

Mr Jayasinghe is the contact person at the ministry regarding the industrial pollution issues. However, we could not meet him due to a misunderstanding on the meeting time, but we have asked the Environmental Laboratories Ltd to organise a meeting with him on behalf of NIVA. Our direct contact with Mr Jayasinghe is limited to a telephone meeting.

The ministry is very concerned about the industrial pollution. One of the most important issue

is that the tanneries are planned to be relocated to the southern part of Sri Lanka (Ambalantota), with a central wastewater treatment plant. There are no funds available for this project, which has been identified as one of the key plans. Ministry also has requirements for the treatment plants for process water. About these project proposals and on other on-going activities will be informed to NIVA.

SL 7. Ministry of Policy Planning and Implementation
Metropolitan Environmental Improvement Plan (MEIP)
Dr Sumith Pilapitiya, National Programme Co-ordinator
Sethsiripaya, Sri Jayawardhanapura, Battaramulla.
tel: +941 863954 fax: +941 863905

MEIP is a project funded by the World Bank, established in seven (?) capitals in the developing world. Colombo is one of them. MEIP in Colombo has been a successful programme, and seemed to have gain a respect in the "environmental" community in Sri Lanka. The details about MEIP is presented in NEAP/EA1P.

Dr Pilapitiya identified five areas as potential projects suitable for NIVA and NORAD parallel financing.

(1). Moratuwa/Ratmalana area is highly populated and concentrated with more than 200 industries. The CIDA (Canadian counterpart to NORAD) has funded a feasibility study for the construction of a central wastewater treatment plant. The study is at it's final stage now, and NIVA will receive a copy of the report. The study will probably suggest a fine screening and an ocean-out fall. The implementation of the treatment plant will be financed by the World Bank's Colombo Environmental Improvement Project (CEIP). However, an EIA will be required prior to the implementation of the project. There are no funds nor consultants available for this part, and would be an ideal start-project for NIVA with parallel financing.

(2) Ekala/Ja-Ela area: There are 145 industries in this area of which 65 are generating industrial wastewater. A study is being conducted to evaluate the possibility of constructing sewerage network for collection of wastewater with a central activated sludge treatment follows by discharge in to the sea or via a river to the sea. The CEIP will again finance the implementation, but an EIA is required. Especially during the droughts, the dilution will be a problem when discharging to a river and the impact on the lagoons are to be evaluated. No funds or consultants are identified, and another suitable project for NIVA.

(3) Ground water: There are two authorities in Sri Lanka administrating the water resources. The Water Resource Board administrate the water supply for irrigation purposes while the National Water Supply and Drainage Board administrate the supply of drinking water. The supply of process water does not come under these authorities, and the industries are now using tube-wells for this purpose. There are no planing, research or evaluation of these wells, which may result in to a fall in the water table. Although it is unlikely to the first sight, no information on ground water recharge systems are available in Sri Lanka. Therefore, a need for such a study exists.

(4) Restoration of Lunawa-lagoon. JICA (Japanese counterpart of NORAD) may consider to

finance the restoration of Lunawa lagoon, which is 1 km long and full with anaerobic activities. A feasibility study (?) and an EIA is required.

(5)Beira lake cleaning: CEIP is financing this project, addressing the most polluted and centrally located lake in the city of Colombo. At the current stage, it is proposed to block all the wastewater outlets to the lake and rely on self-cleaning as the solution. However, the water in the lake is so deteriorated, it may take some time if only the self-cleaning is to be expected. No studies have been done on this issue, and the feasibility using models will be an advantage.

The above project-ideas have been selected among many potential projects in Sri Lanka. Dr Pilapitiya also mentioned that for certain projects, even partial financing could be expected from MEIP or CEIP. Otherwise, all of these project-ideas could be identified as suitable for parallel financing through NORAD, since a good portion of them are already financed by other donors.

SL 8. Environmental Laboratories Ltd (ELL)

Mr Nihal de Silva, Managing Director
135/1 Old Kottawa road, Maharagama.
tel: +941 851070 fax: +941 851198

ELL is a consultant company in Sri Lanka with the expertise in water and wastewater treatment technology. They are representing an Indian ion-exchange producer. They have lab-facilities, a fair engineering staff and a fair monitoring capacity.

ELL has, however, not involved in international projects unlike ECL. Mr De Silva says that their capacity has been a problem, and the ELL did not want to hire local professionals on project basis as ECL to cater international companies as their local partners.

ELL is undergoing a major reorganisation at present, including a merge with Bamber and Bruce Ltd, Colombo. A further meeting was scheduled together with Bamber and Bruce to discuss details.

SL 9. Bamber and Bruce Ltd (BBL) : a partner of ELL

Dr C.S.Suranjan de Silva, Managing Director
56 1/1 Vajira road, Colombo 5.
tel +941 500254 fax: +941 508813

Mr Nihal de Silva of ELL was present at the meeting. He presented a brief information on ELL and a draft of ELL's wishes and capabilities to act as the local partner for NIVA.

BBL is one of the oldest micro biological laboratories in Sri Lanka. Among their latest activities, an EIA for Ekala/Ja-Ela area (see SL 7, pkt 2) was mentioned.

The importance of personal contacts with the government was emphasised for realisation of projects, and the BBL seemed to have a fair ability in this aspect.

BBL mentioned that NIVA should register at CEA as a consultant for environmental issues and aquaculture. NIVA should also register at the Board of Investments (BOI), environment section in order to be eligible to undertake such projects.

They also mentioned about potential project proposals related to prawn farming; river water pollution, disease caused by the discharge and receiving of water from the same lagoon, intensification of farming etc.

Computer modelling on EIA has identified as one of the important areas. The only expertise is available at the State coast conservation board, and if NIVA can provide with such expertise, many project possibilities will be available.

It was agreed to prepare a letter of intent on mutual collaboration among NIVA and ELL, and to prepare a document for the submission for CEA, incl. NIVA's biodata. ELL undertook to supply NIVA with the current regulations on environmental issues and will acquire a copy of NEAP and EAIP.

SL 10. The Institute of Fundamental Sciences (IFS)

Dr E. Ivan L. Silva, Head, Dept. for Environmental Sciences

Prof. K. Tennekoon, Acting Director.

Dr S.Y. Namaratne, Junior Research Fellow.

Hantana road, Kandy.

tel: +948 32002 fax: +948 32131

The IFS was established in 1981, with the primary aim of establishing a cohesive network of local scientists involved in basic research. Promote research of national importance and the interaction with scientists of other countries are also among the aims.

The IFS consists with five departments: Physical and Chemical sciences, Life sciences, Earth and Space sciences, Philosophy and Social sciences and Environmental Sciences.

IFS is currently working on many projects which may be of interest to NIVA. The acid-rain research, pesticide monitoring using bioindicators, quality assessment of surface waters and modelling are among them.

Prof. Tennekoon is also working on physical-chemical methods for removal of micro-pollutants from water, which seemed to be very interesting.

During our short meeting, it was clear that the IFS could function as a partner for the adoption of advanced treatment technologies to local conditions. Additionally, NIVA will be able to study their other interesting research concepts for practical applications both in developed and developing countries.

Their working profile was identified to be very interesting for collaboration with NIVA, and we have, therefore, decided to organise further meetings with IFS scientists. Financial aid for this purpose is applied through the Norwegian Research Council.

SL 11. International Federation of Red Cross

Mr Dilip Chaudri, Head of delegation

Mr Jon Fredrik, Development delegate

120, Park road, Colombo 5.

tel: +941 581903 fax: +941 583269

The Red Cross is concerned about the health aspects of water and the water supply. Preparations for disasters like droughts and floods are among the other interests.

The Red Cross is experiencing problems with the water supply for refugee camps. They often use large wells, but no water quality analysis is done. Sometimes, the wells has to be cleaned for re-settlement.

The Red Cross is also supporting for a campaign on clean water. They have shown interest in fast bacteriological tests as Colifast-systems, which could be used in the field.

The Red Cross has showed their general interest and appreciation on NIVAs engagement in environmental technology in Sri Lanka, and requested a copy of the project report.

Other suggested meetings:

1. Mr Sapukotana, National Programme Co-ordinator-NEAP, Ministry of Policy Planing and Implementation. Mr Sapukotana would have been able to inform us on the latest developments of the NEAP and EA1P, but was not in Sri Lanka at that time.

2. Dr David McCauley and Mr Vasantha Siriwardena, Natural Resources and Environmental Policy Project (NAREPP). This is one of the major environmental projects in Sri Lanka funded by USAID. Both of the persons-in-charge were abroad during NIVA's visit to Sri Lanka. However, Dr Pilapitiya (MEIP) oriented about the activities of NAREPP.

5.2 Meetings in Bangladesh

BD 1a. NORAD, Dhaka

Ms Berit Fladby, Actg. Resident Representative
NORAD, PO Box 548, Dhaka 1000
tel: +880-2-883065 fax: + 880-2-883661

Ms Fladby informed us about NORAD, Dhaka's current and planned activities which are related to the environment. Although the NORAD funds many activities in Bangladesh, the issues directly related to the water and wastewater treatment and supply do not seem to be among the prioritised activities in the country programme. However, Ms Fladby encouraged us to explore the possibilities in Bangladesh, and has already arranged an important meeting schedule with the authorities. NORAD Dhaka has also been very helpful in attending to all our practical matters.

Since our visit coincide with the vacation period at the NORAD office, we were not able to meet other programme-officers. For further assistance, we were introduced to Mr Jamal Mahmood, an environmental advisor at NORAD.

BD 1b. NORAD, Dhaka

Mr Jamal Mahmood, Environmental Advisor

NORAD has funded a part of the IUCN (International Union for Conservation of Nature) on environmental issues, which was completed in 1991. This study, however, has not been readily accepted for implementation by the ministry of Environment and Forest (ME&F), probably due to a conflict of interests.

A part of the IUCN study is now selected, and identified as the National Conservation Strategy (NCS) and is financed by NORAD with Nkr 15 mln. Joint-secretary at the ME&F Mr Fuzlul Huq functions as the project manager for NCS. The aims of NCS are following:

- increase the capacity at the ME&F and other environmental institutions.
- develop environmental management plans
- introduce environmental issues in to the public administration bodies.

Mr Mahmood also suggested a list of other persons related to environmental issues in Bangladesh, with many of whom we had meetings later.

BD 2. Ministry of Environment & Forestry (ME&P)

Mr Karar Mahmudul Hasan, Deputy secretary, National Conservation Strategy (NCS) and Project Director, National Environment Management Action Plan (NEMAP).

Mr Hasan stated that the NCS addressed only a limited number issues in the country, and the NEMAP was established as a supplement to it. NEMAP is UNDP funded and reported to address 25 000 issues (!). The NEMAP is also addressing several issues from the grass-root

level. A draft report is expected by the 31st August 1994.

Mr Hasan introduces us to Dr Babar N. Kabir, who is engaged by the NEMAP as a consultant.

BD 3a. Resource Control Company

Dr Babar N. Kabir, Managing Director
House 55 Road 6/A, Dhanmondi R/A, Dhaka 1000
tel: + 880-2-816224 fax: + 880-2-813186

Dr Kabir is working on a part-project in NEMAP addressing 3 issues:

- sanitation
- water quality deterioration
- pesticide pollution

He has further described on other NEMAP issues, but stated that it will be impossible to meet the deadline due to the underestimated capacity of the project. Dr Kabir said that the DANIDA had funded some water related projects, contrary to NORAD.

We have agreed for a later meeting at his office to discuss possible co-operation with NIVA

BD 3b. Resource Control Company

Dr Babar N. Kabir

The Resource Control Company is a private consultant firm offering their services as a local partner for international donor projects. A complete information on the RCC was provided to us.

Dr Kabir stated that in Bangladesh, all studies/projects are generally oriented towards to the local government. A success of a project approval seem to lie there. For e.g., the Danish Hydraulic Institute has proposed a study with DANIDA funds, but addressing the whole Bangladesh. The project has not been accepted yet, because the Government of Bangladesh (GOB) wants to limit the project to Dhaka.

The ministry of environment has to approve all project proposals. A typical Technical Assistant Project Proposal (TAPP) is first sent to the ministry after preparation by the local and/or international consultant. After about 2 months, if the proposal is approved, it will be sent to all donors. It is then the local project partner starts its lobby services to guarantee the project to be reserved for the donor and the international firm who prepared the proposal. Some of the proposals are left without funding, and any donor agency can then pick such a proposal for implementation. A list of such projects are available from the ministry and Dr Kabir agreed to send it to NIVA. When we have selected the interesting proposals, he will forward us further details on those projects.

The RCC seemed to be an appropriate partner for NIVA for conducting short term consultancy projects.

Resource Control Company (RCC) is a partnership company, formed in 1988. It evolved out of Services and Company (SVSCO), a company formed in 1978. RCC's evolution coincides with the growing concerns and understanding about environment in Bangladesh. Realising that there was an urgent need for a private sector consultancy firm in Bangladesh, which specialised only in the field of environment, a separate company was formed. Since its inception, RCC has acquired a number of environmental "firsts" in Bangladesh, and has since grown into a leading private company in the field of environmental science. Its main area of concentration has remained industrial pollution and pollution control systems, though studies on different areas of environment have been conducted by RCC.

RCC, Environment Consultants, is a member of the Ghorashal Group of Companies, which includes the only plastic co-extrusion industry in Bangladesh, Ghorashal Multi-layer Plastic Packaging Limited. Amongst other concerns are the Ghorashal Containers Limited - a plastic container manufacturing plant; B.H. Enterprise - exclusive distributors in Bangladesh of United Distillers, Heineken, Marlboro, Pierre Cardin, Toblerone, etc.; Sabir Traders Limited - a duty-free bonded warehouse for diplomats; Services and Company (SVSCO) - marketers of electronic consumer items including industrial and domestic water purification systems; and Friends Apartment Limited - a real-estate company. All their services are available to assist RCC in fulfilling any of its tasks.

RESOURCE CONTROL COMPANY is a multi-disciplinary consulting organisation in technical and management fields, founded in 1988. Over the six years of its operation, it has developed a diverse range of skills in the field of technical and environmental consultancy including environmental impact assessment studies, technology status surveys, design and implementation of pollution control systems, infrastructure planning and development, materials handling, power, energy, personnel selection and training.

RCC has carried out a number of environment impact assessment studies for reputed industrial houses of Bangladesh to assess the impact of new and expansion projects, and has prepared environment management plans to mitigate potentially negative impacts. RCC has also carried out national level studies in the field of environment for the Government of Bangladesh.

Presently, RCC is enlisted with the United Nations Economic and Social Commission for the Asia and Pacific (UN ESCAP), United Nations Development Programme, Dhaka (UNDP), the Ministry of Environment and Forests (MOEF) and the Department of Environment (DOE) of the Government of Bangladesh as a private sector environmental consulting firm. It has also conducted studies for the Asian Development Bank (ADB).

BD 4a. Department of Environment (DOE)

Mr Syed A.N.M. Wahed, Director General
House 2, Road 16 (new), Dhanmondi R/A, Dhaka 1209
tel: +880-2-812461

Mr Wahed was very interested in project co-operation with NIVA. He has discussed the necessities in general and introduced us to Mr Mohamd Reaz Uddin for further information.

BD 4b. Department of Environment (DOE)

Mr Mohamd Reaz Uddin, Deputy Director (Research)

The treatment of municipal and industrial wastewater in Bangladesh is still at a very young stage. For the whole Bangladesh there is only one sludge treatment plant, which illustrates this situation.

When we have informed the purpose of NIVA's visit to Bangladesh, he has presented a list of project alternatives which could be interesting to NIVA.

(1). No WWTP are available at many of the industries. The result is the discharge of untreated wastewater in to the common sewers. A study on required specific treatment levels and an EIA on this subject is will be interesting to the GOB. The ministry will be interested in managing such a study, while the implementation will be realised through the municipal corporations.

(2) A study on effect of toxicants like pesticides and heavy metals on water bodies. Advise the GOB on the status and suggest rehabilitation methods.

(3) A study on the effect of pollution on the marine ecology. The total cumulative pollution load on coastal areas is required to be studied. Monitoring and measuring concepts of such loads are need to be investigated.

(4) Laboratory upgrading, instrumentation and training of personnal at the divisions of department. Environmental regulations will be enforced by the end of the 1994. The implementation of this will require analytical facilities for the authorities.

In addition to the above proposals, the ADB funded National Environmental Monitoring and Pollution Control project has suggested several other projects. The study was completed by the Seatec International Consulting Engineers, Bangkok, Thailand in July 1992 and the report is available from ADB as TA 1104-BAN.

Mr Reaz Uddin appeared to be a resourceful person. He also suggested that a meeting should be organised between DOE, Ministry of Environment and NORAD where the issues and project possibilities should be discussed and formulate a intention note.

BD 5. Bangladesh Water Development Board (WAPDA)

Mr M. Majidul Islam, Chairman.

WAPDA building, Motijheel Commercial Area, Dhaka 1000, Bangladesh

tel: + 880-2-862330

One of the major problems in the southern Bangladesh is the salt water intrusion. In the droughts, especially when India restricts the water flow to major rivers, the sea water starts to travel inwards to the country. The effect of this phenomena is increasing.

WAPDA is primarily interested in large irrigation projects. Prefeasibility studies are usually conducted by the Flood Plan Co-ordinating Organisation (FPCO), including an environmental assessment.

The level of ground water in the northern Bangladesh (Takulgam area) is appeared to be decreasing or has started to be inaccessible. This is probably due to a low recharge level. A study on this is required, but it is difficult to obtain international funding for this purpose due to the low rate of return according to cost-benefit analysis.

BD 6. Bangladesh University of Engineering and Technology (BUET)

Prof. Ainun Nishat, Dept. of Water Resources Engineering

Prof. Feroze Ahmed, Dept./Div. of Environmental Engineering

BUET, Dhaka 1000

tel: + 880-2-502349 fax: + 880-2-863026

The BUET was established in 1876, and has obtained the university charter in 1962. There are 4 other Bangladesh Institute of Technologies and several Institute of Technologies related to specific industries in Bangladesh.

The Civil engineering dept. is consisted with the divisions for structural, geotechnical, public health and environmental engineering. The Water Resources Engineering was under the civil engineering dept. earlier, but now established as an own dept. The BUET and it's staff actively involve in international environmental projects.

The first draft of NEMAP was prepared by prof. Nishat, while the UNDP has revised it for the 3rd time.

Tannery waste in Hazaribag area is one of the major environmental problems in Dhaka. Only 40-50% of population in Dhaka receives pipe borne water while the rest depends on hand pumps and ground water. The toxic waste in the Hazaribag area may infiltrate into drinking water sources. An EIA was requested once on this subject, but was never conducted due to the lack of qualified personnel. There is a necessity for teaching students on EIAs, and Nishat is teaching EIAs related to flood action plans and to water supply.

The Department of Environment (DOE) is very vulnerable for personnel transfers, since it depends on few professionals. The bureaucratic problems in project proposal approval may be very frustrating. For e.g. it took 4 years to approve a flood control programme with JICA

and 6 months to obtain a support to BUET from NORAD.

Acid rain could be an important issue, although this has never been investigated. The fact that the Indian industrial city of Calcutta is only 30-40 km away from the border increases the possibility of acid rain.

BUET has a problem to keep PhD students although satisfactory stipends are available. BUET is having many good relationships between other universities like U of Alberta, U of Delft., U of Sheffield and U of Texas. The channelling of aid is a long bureaucratic procedure, but funds under US\$ 100 000 could be directly approved by the DOE.

The Bangladesh Centre for Advanced Studies (BCAS) was mentioned as an effective organisation for collaboration research, with established routines which can bypass many bureaucratic authorities. BUET works closely with them and a meeting was suggested.

BD 7. International Union for Conservation of Nature (IUCN), Dhaka

Mr A.M. Choudry, Resident Representative
76, Satmasjid road, Dhaka 1209
tel: + 880-2-812061 fax: +880-2- 818369

IUCN is not a donor organisation. Donors bear the running costs and the project costs of IUCN, where the Norwegian govt. is also a donor.

The IUCN study on Bangladesh environment was conducted with bi-lateral aid, but initiated and carried out by NORAD.

Further studies are interested in:

- Project formulation on wetlands conservation
- training on EIA preparation for new and existing industries
- study on city waste disposal

We were informed to take further contact with Mr Vitus Fernando, head of the Asia section, IUCN Geneva headquarters.

BD 8. Dhaka Water and Sewerage Board (WASA)

Mr Nazir Ahmed, Chairman
Mr Abdul Muqet, Chief Engineer
98, Kazi Nazruyl Islam Avenue, WASA Bhaban, Karwan Bazar, Dhaka
tel: +880-2-326323

After a brief introduction and a discussion, Mr Ahmed suggested that we visit the wastewater treatment plant and continue the meeting with Mr Muqet.

Dhaka supplies 722 mln l/day while only 14 mln l/day are surface water. The rest is obtained from ground water, which has low or none nitrates and ferrous ions. However, the ground

water recharge is expected to be not efficient. There is a 58% difference between the supply and demand of water. WASA has plans to supply 900 mln l/day in 1998, which requires 7040 mln Thaka (ca.Nkr 1.2 bln). The French government has agreed to supply all electromechanical instruments and WASA has applied for loan from IDA/WB.

The water consumption at Dhaka is about 180 l/day. pe, while a 56% of billing loss is observed due to leakage and illegal connections.

A comprehensive paper on Dhaka water supply problems was given to NIVA. It is possible to identify part-projects from this paper for NIVAs engagement.

BD 9. Dhaka Domestic Wastewater Treatment Plant, Pugla

Mr. M.A.Mannan, Executive Engineer

The Pugla WWTP was originally constructed in 1974 with a capacity of 14 mln l/day. JICA has funded the upgrading of plant, which has increased the capacity to 85 mln l/day.

Treatment process consists with primary screening with 40mm and 20mm strainers and settling for two hour, seven days retention in facultative lagoons and over 90 days retention in sludge lagoons. The plant personnel is proud about the efficiency of 70% BOD and SS removal, while the absolute values after treatment were usually over 70 mg/l BOD and over 70 mg/l SS.

The treated water is usually chlorinated during the droughts to reduce the health hazards.

No plans for sludge disposal or treatment, since this was not planned under the JICA aid.

BD 10. Asian Development Bank (ADB), Dhaka

Mr Thalukdar, Project Officer

Mr Thalukdar briefed about ADB procedures in Dhaka. He stated that the bureaucracy among the government authorities significantly delays the project start. Even TA projects, which are entirely a grant, are very delayed.

ADB is currently funding a project on Industrial Pollution Control Management, which will identify the need for several part-projects.

He was under the impression that any extension of ADB projects has to be open for bidding by all member countries, even if it is partially financed by NORAD. This has to be clarified further. Both the donors and governments can initiate the projects, which will be then evaluated by ADB and its economic relation section and the ADB project officer. Then the proposal is sent to the ministry which follows with a feasibility study and an investment study. For the case of Bangladesh, two years should be considered as the average proposal process time (!).

BD 11. Bangladesh Centre for Advanced Studies (BCAS)

Dr Atiq Rahman, Managing Director
620, Road 10 A (new), Dhanmondi, Dhaka 1209
tel: + 880-2-315793 fax: + 880-2-811344

BCAS is a non profit research organisation established 8 years ago, and has 40 full time employees and 200 part-time employees.

A very good summary over practical problems which international consulting firms face was presented. The most disturbing fact is that about 20% of all donor funds will be absorbed as bribes. A detailed information on this meeting will be provided later.

WHAT IS BCAS ?

Bangladesh Centre for Advanced Studies (BCAS) is an independent, non-profit making, non-government research organization. It serves as :

- a) a leading Bangladeshi organization working on **Resource Management, Environment and Developmental (RMED) issues.**
- b) a focal point of the existing, but often diffused intellectual and scientific energy and manpower to develop national capability to address and focus on RMED issues particularly in **multi-disciplinary and inter-disciplinary areas : and**
- c) a **think-tank or a policy institute to address RMED issues.**

It aims to (i) develop appropriate **scientific methodologies** to address the long-term planning and people's issues, and (ii) to develop a database on RMED.

BCAS is manned by high-level professionals mostly with training and research and working/academic experience in the western universities. It raised its first issues (Environmental Aspects of Agriculture and Surface Water Systems) in 1986 and started follow-up activities and raised two other issues (Social Forestry and National Conservation Strategy) in 1987.

BCAS ACTIVITIES

BCAS programmes fall under three main categories : national, regional and global.

BCAS has been working on international programmes, regional projects, national policies, publications, environment-development interactions and basic science. Across this range the following programmes are currently in progress :

HOW BCAS WORKS

It has a small core activity with two full-time directors, ten professionals, a dozen full-time field researchers and another dozen computer/information and logistic staff. But BCAS's main strength is its **NATIONAL FELLOWS** who are experts working in universities, research centres, national and international agencies, NGOs and in the private sector. Seventy to two hundred of these national fellows work with varying degrees of time commitment in different inter-disciplinary groups (of usually 6 to 10). There is also a large body of **INTERNATIONAL FELLOWS** who work or have expertise in RMED issues or in Bangladesh. They are usually recognized as experts working at leading universities, research centres, NGOs and other agencies in many countries of the world.

BCAS raises RMED issues of national importance, through brain-storming and wide ranging consensus building, identifies research agenda, prioritizes and develops appropriate **inter-disciplinary and multidisciplinary research** projects and research methodologies. These project are carried out by BCAS Fellows who are drawn from different disciplines including natural, social, engineering and health science and from many different institutes from all over Bangladesh and abroad.

BCAS work closely with a number of national and international agencies including the Government of Bangladesh and its agencies, national and international NGOs, other development agencies (Ford Foundation, NORAD, USAID, DANIDA, CIDA, WHO, UNDP, ADB amongst others). But so far funding has been very limited and all existing funding is project or soft funding.

Project-by-project BCAS **links up** with varying degrees of interaction with **centres of excellence** all over the world which have appropriate experience and knowledge base. For instance, BCAS is working closely in social forestry with Universities of Berkeley and Yale in USA, Agriculture University, Norway, Bangladesh Agricultural Research Institute, and Bangladesh Agriculture Research Council amongst many others. On environmental issues BCAS works with the International Institute for Environment and Development (IIED), London, Centre for Environmental Management and Planning (CEMP), Aberdeen University, U.K., World Resources Institute (WRI), Washington D.C., IUCN, WWF, Environment Defense Fund (EDF) and the Natural Resource Defence Council (NRDC), amongst many others.

At the **national policy** level the BCAS Fellows interact closely with policy planners, government agencies, donors and NGOs so that the results of BCAS research can be used at both policy and implementation levels. BCAS also works on **people's developmental and environmental** issues and attempts to incorporate these to the **national policy and planning**.

BD 12. Visit to Hazaribag Industrial area

Hazaribag is an area within the Dhaka city and very concentrated with tanneries. The smell and the coloured wastewater flowing through the open sewers were very common to the area.

Details will be presented later.

BD 13. NORAD, Dhaka: Concluding Meeting

Ms Berit Fladby

NORAD was very interested to obtain a summary of our experiences. After presenting NIVA's experiences and viewpoints on water related environmental issues in Bangladesh, especially in Dhaka area, it was agreed on the potential and the necessity of the issue. NIVA will send a copy of the travel report, and will keep NORAD informed on further business development. At a later period NORAD agreed to consider a meeting among NIVA, NORAD and Bangladesh authorities in order to discuss and formalise any further activities.

5.3 Meetings in Thailand.

Since we were forced to overnight in Bangkok due to flight combinations, we have decided to have a meeting with AIT and a visit to Bangkok canals.

TH 1. Asian Institute of Technology (AIT), Bangkok

Prof. Chongrak Polprasert, Head, Dept. of Environmental Engineering (DEE)

Dr S. Visvanathan, Senior Lecturer

Dr Ajith Annachatre, Lecturer

The DEE's activities are consist with high technology, intermediate technology and appropriate technology, in equal parts.

Activities include heavy metal removal from electroplating industry WW, humuic/fulvic acids removal by coagulation and development of filtration techniques.

Both DANIDA and SIDA are actively involved in funding of DEE at AIT. NORAD has been supporting the faculty of human sciences, but not the DEE.

TH 2. Visit on Bangkok canals

A short boat trip on Bangkok's canals was made. The canals are known to be very polluted, and several proposals have been made earlier to clean them.

6. Conclusions

A significant potential for project activities exists in Sri Lanka and Bangladesh. Both countries have environmental problems where NIVA's expertise might be useful. In addition to the issues of water and wastewater treatment, a considerable amount of project possibilities in water resource management, coastal studies, EIA, institutional building etc., are available.

The two countries have different approaches to project preparation procedures. The involvement of local partners is valuable and needed.

NORAD and its various forms of development-aid should be considered as the most valuable financial source for the establishment of initial projects. Possibilities to obtain other financing do exist, but should be considered for later projects.

To evaluate the activities in the south-east Asia as a possible major area of activities for NIVA, it is suggested to establish two small-scale projects in Sri Lanka and Bangladesh. These projects will indicate the resource requirement for engagement in these countries, together with possible problems. Such projects will also give the possibility to plan further projects and to evaluate local partners.

NIVA



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