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ENVIRONMENTAL SECTOR STUDY -
SRI LANKA

ROYAL NETHERLANDS EMBASSY

FINAL REPORT

APRIL 2000

In association with
IUCN-Sri Lanka

IUCN
The World Conservation Union



ARCADIS EUROCONSULT

ROYAL NETHERLANDS EMBASSY, COLOMBO

**ENVIRONMENTAL SECTOR STUDY
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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
BCAP	Biodiversity Conservation Action Plan
BOI	Board of Investment
BONN	Convention on the Conservation of Migratory Species of Wild Animals
CBD	Convention on Biological Diversity
CBO	Community-based Organisation
CBT	Ceylon Tourist Board
CCD	Coast Conservation Department
CEA	Central Environmental Authority
CEB	Ceylon Electricity Board
CEIP	Colombo Environmental Improvement Project
CISIR	Ceylon Institute for Scientific and Industrial Research
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DA	Department of Agriculture
DWCL	Department of Wildlife Conservation
EA	Environmental Assessment
EA1P	Environmental Action 1 Project
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIMS	Environmental Information Management System
UE	European Union
F&F	Flora and Fauna
FD	Forestry Department
GCA	Greater Colombo Area
GEF	Global Environmental Facility
GIS	Geographic Information System
HORDI	Horticultural Research and Development Institute
IDA	International Development Agency
INGO	International Non-Governmental Organisation
IRMP	Integrated Resources Management Programme in Wetlands
IUCN	International Union for the Conservation of Nature (World Conservation Union)
LUPPD	Land Use and Policy Planning Division
MARPOL	International Convention for the Prevention of Pollution by Ships
MASL	Mahaweli Authority of Sri Lanka
M/A&T	Ministry of Civil Aviation and Tourism
M/FAR	Ministry of Fisheries and Aquatic Resources
M/F&E	Ministry of Forestry and Environment
M/H&IM	Ministry of Health and Indigenous Medicine
MPA	Marine Protected Area
MPPAA	Marine Pollution Prevention Authority Act
MSA	Matrix for Stakeholder Analysis
NARA	National Aquatic Resources Agency
NARDA	National Aquatic Resources Research and Development Act
N/A	Not applicable
NBRO	National Building Research Organisation
NCR	National Conservation Review
NEAP	National Environmental Action Plan
NGO	Non-Governmental Organisation
NHWAA	National Heritage Wilderness Areas Act
NSF	National Science Foundation

NWRA	National Water Resources Authority
NWSDB	National Water Supply and Drainage Board
PA	Protected Area
PAMWCP	Protected Area Management and Wildlife Conservation Project
PCAF	Pollution Control and Abatement Fund
PGRC	Plant Genetic Resource Centre
RAMSAR	Convention on Wetlands of International Importance
RDA	Road Development Authority
RNE	Royal Netherlands Embassy
SAM	Special Area Management
SASTAC	South Asian Technical Advisory Committee
SEAN	Strategic Environmental Analysis
SLLRDC	Sri Lanka Land Reclamation and Development Corporation
SNR	Strict Natural Reserve
STC	State Timber Corporation
TMP	Tourism Master Plan
UNCED	United Nations Convention on Environment and Development (Rio Declaration)
UNCLOS	United Nations Convention on the Law of the Sea
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank
WHC	World Heritage Conference
WHO	World Health Organisation
WS&S	Water Supply and Sanitation

1 INTRODUCTION

1.1 Background

The External Resources Department of the Government of Sri Lanka requested the Royal Netherlands Embassy (RNE) to focus its programme for development co-operation on three sectors: the environment, rural development, and relief, rehabilitation, and reconciliation. In the field of the environment, the RNE was asked to place special emphasis on natural resources management and to work closely with the lead-donor in this area - the Asian Development Bank (ADB). The request was based upon proven Dutch capabilities and track record in this sector, and upon the Dutch policy focus on a participatory approach towards sustainable resources management, poverty alleviation, and conservation of biodiversity. Acceptance of the request would imply, that an important part of future Dutch development assistance would show emphasis on co-financing of green sector loan projects of ADB and WB, as well as on bilateral support to this sector.

The official Dutch reaction to the request was in principle positive. Projects that would immediately be of interest are continuation of bilateral activities (mainly the Integrated Resources Management Programme in Wetlands), and potential co-financing of various ADB projects in the pipeline:

- Coastal Resources Management Project;
- Protected Areas Management and Wildlife Conservation Project;
- Forestry Resources Management Project;
- Water Resources Project.

In order to be able to judge whether future Dutch assistance in the sector is really used for top priority issues, the Royal Netherlands Embassy (RNE) decided to carry out an *Environmental Sector Study*, with the purpose of:

- preparing an overview of all main outstanding issues in the environmental sector, both technically and institutionally;
- prioritising these issues, and obtaining consensus on this prioritisation;
- analysing the conformity of the priority issues with (on the one hand) Dutch policies, and (on the other hand) with pipeline projects;
- prepare recommendations for future assistance by RNE to the sector.

Commonly, a sector review or study starts one step earlier than the present one, namely with a detailed description of the sector and with justification of its importance. However, numerous (sub-)sectoral reports and overviews are available (see section 5: References), and they do not have to be repeated. As far as justification of the importance is concerned: the facts that a National Environmental Action Plan and a Biodiversity Action Plan exist, and that for the management of virtually every natural resource in Sri Lanka a strategy (or at least a policy) exists, indicate the relevance of the sector for the country's future, and therewith the urgency to assist the sector. Sri Lanka is (and will remain) strongly dependent on its natural resources: both exploitation and conservation attribute substantially to the national income in kind or cash. The level to which exploitation is sustainable is long surpassed for most of the resources; a notable trend in conservation is evolution in the direction of exploitation (examples: eco-tourism, ayurvedic medical tourism).

1.2 Organisation of the Study

The Environmental Sector Study was tendered by RNE in January 2000, and the tender was awarded to an association of ARCADIS Euroconsult of the Netherlands, and IUCN Sri Lanka. The Study commenced on 01 March, and ended 07 April with delivery of the draft final report. The Study team consisted of:

- drs Hans van Zon, Senior Environmental Specialist with ARCADIS Euroconsult and Study Leader;
- mrs Shiranee Yasaratne, Senior Environmental Specialist and Country Representative of IUCN Sri Lanka.

Substantial additional assistance was received from other IUCN staff, both technically and logistically. Acknowledgements are also to be made to a number of resource persons in various institutions throughout Sri Lanka, with whom data and issues were checked.

The ToR for the Study are shown in *Annex A*; *Annex B* presents the itinerary of the Study team. During the Study period a progress report was delivered to the RNE on 27 March, and a presentation was given to the Netherlands "Country Team" on 25 March.

1.3 Structure of the report

Following the introduction, Chapter 2 describes the approach to the study, including flow charts and methodologies used. Chapter 3 (with annexes) presents the results of data collection, data analysis, and prioritising of issues, and Chapter 4 translates the findings into recommendations. Chapter 5 lists the main references used for the Study.

2 APPROACH AND METHODS

2.1 Approach to the study

As stated earlier, this Study did not intend to repeat basic information on availability and distribution of the various resources in the country. This information can be found in numerous books and reports, all indicating a substantial and rapid decline of numbers of wild flora and fauna, over-exploitation of forest and fisheries resources, and degradation of soil and water quality. A quantified summary of these trends is given in the *Natural Resources of Sri Lanka, Conditions and Trends* (NARESA 1991) and in the *National Environmental Action Plan* of 1998. This Action Plan also identifies interventions to counteract or redirect most of these trends, but in practice major improvements are still to be seen. Interventions are mostly delayed by extensive administrative procedures, turning them inadequate, since the forces behind the negative trends are continuing and often increasing.

The main two forces behind the degradation of natural resources are the growth of the population and of the economic situation in the country. In the period 1994-98 the population increased from 17.9 to 18.8 millions (5%), whereas the per capita GDP increased from 32,400 to 54,000 Rs (67%). The pressure on natural resources increased as a result of more exploitation (land, water, food, products), intensification of production (pollution, loss of fertility), and developments (land use, waste, pollution). The traditionally high consciousness for nature and natural resources gave rise to simultaneous development of controlling mechanisms: the development of a National Environmental Act (later supplemented by pollution licensing and EIA procedures), the establishment of the Central Environmental Authority (CEA) and a Ministry in charge of Environment, the ratification of most international conventions in the environmental sector, and the adoption of a National Conservation Strategy, a National Environmental Action Plan and a Biodiversity Action Plan.

So far, all this has not resulted in sufficient environmental awareness to turn the trends significantly. It is the *overall objective* of the present Study to identify and list the issues that presently obstruct institutional structures to be successful in management and conservation of natural resources to a level that their diversity and quality are assured, and that their economic benefits are exploited in a sustainable manner. *Direct objectives* of the Study are clearly listed in the ToR (*Annex A*), as follows:

- to carry out a quick scan of the environmental sector, in order to list main technical and institutional shortcomings or needs ("issues");
- to prioritise identified issues;
- to analyse the relation between the priority issues and Netherlands policies for the environmental sector and for development assistance;
- to analyse the relation between the priority issues and planned support programmes of main loan donors (ADB and WB) in the green sector;
- to recommend a plan of action for RNE-Colombo.

A *study flow chart* is presented in Table 1. It shows that the Study is divided in two main parts:

- a quick sector scan, during which:
 - ⇒ information is collected, structured, and supplemented;
 - ⇒ collected information is analysed and main technical and institutional issues are identified;
 - ⇒ findings and results are laid down in a progress report.
- an analysis of sector options, during which:
 - ⇒ a consensus-building workshop is organised, during which agreed issues are prioritised;
 - ⇒ prioritised issues are projected towards Netherlands policies and towards planned interventions of loan agencies;
 - ⇒ recommendations are prepared for future Netherlands development assistance in the sector;
 - ⇒ findings are laid down in a draft report, to be finalised after receipt of RNE comments..

ENVIRONMENTAL SECTOR ANALYSIS

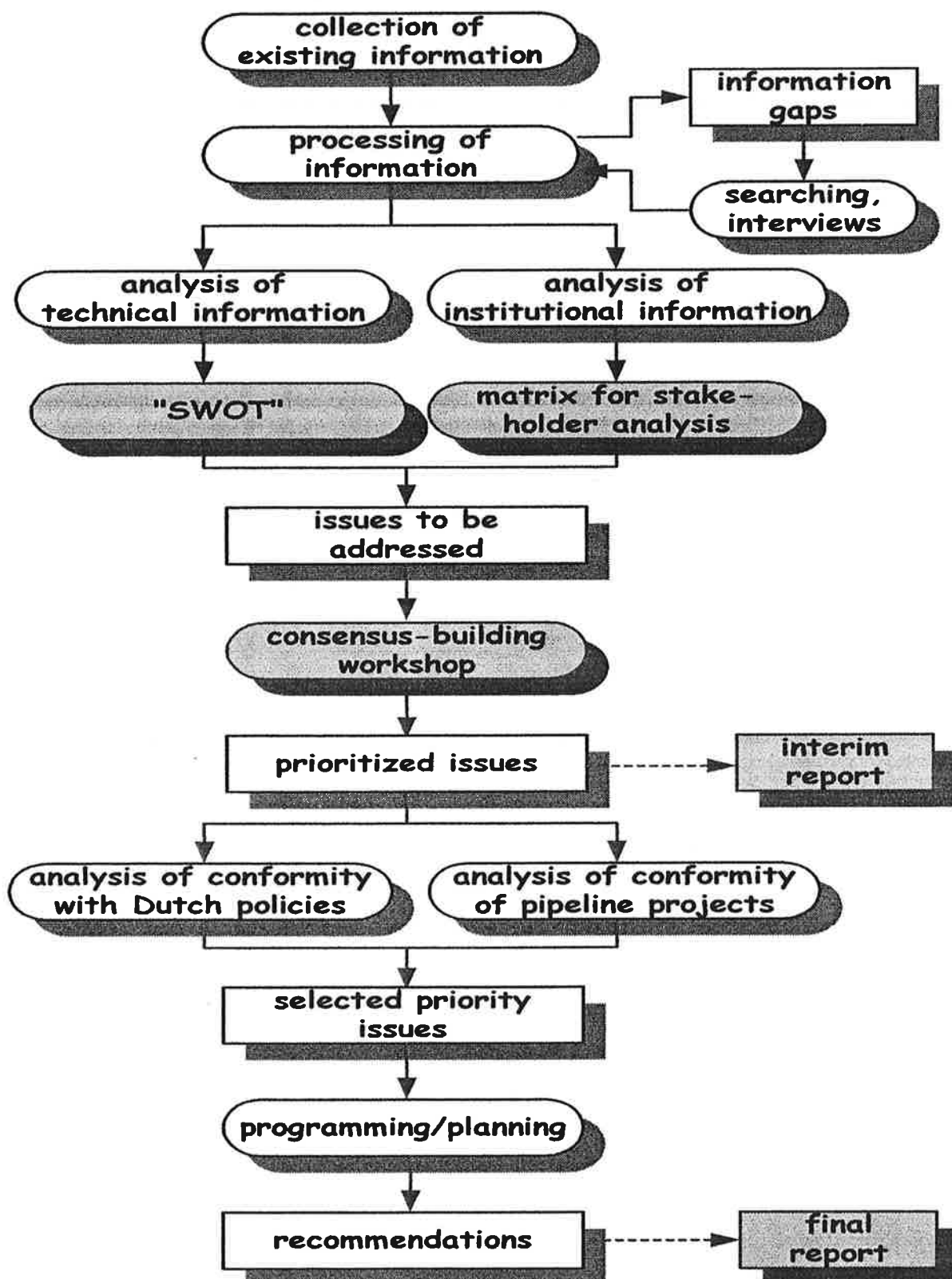


Table 1 - Study flow chart

2.2 Data collection

In Sri Lanka, a large amount of publications and reports is available on natural resources and their management. For reasons of time-efficiency and in order to streamline the data collection exercise, short-cuts were used:

- a simple *natural resource management “model”* was designed (Table 2), in which all ingredients for management are shown in their interdependence; by limiting of data collection to these main ingredients all major issues are expected to be detected (minor problems are considered to always be a consequence of a higher-level problem);
- a *list of “resources”* was prepared (Table 3). This list may not seem completely logical (the listed “resources” are not of the same order of magnitude or character), but it is based upon the common categorisation of resources in Sri Lanka. This was considered an easier way to obtain listing of major issues, than when resources were first combined, or placed in an unfamiliar sequence;
- a *matrix*, in which the ingredients of the model are confronted with a set of simple questions (Table 4), such as:
 - ⇒ is this element for natural resource management in place, or, if not, what has to be done to get it in place?
 - ⇒ is there consensus on the quality of this element of resource management?
 - ⇒ does an adequate organisational framework exist to apply (or develop) the element?, and
 - ⇒ are there adequate human, financial and material resources for application (or development) of the element?

The matrices (one for each of the resources of Table 3) were filled in by IUCN staff, using published information, where needed supplemented through interviews with subject-matter specialists. The matrices were discussed in team sessions, and gaps identified. Missing information was collected through either specific literature search, or in discussions with top-level representatives from the sub-sector concerned.

NATURAL RESOURCE MANAGEMENT

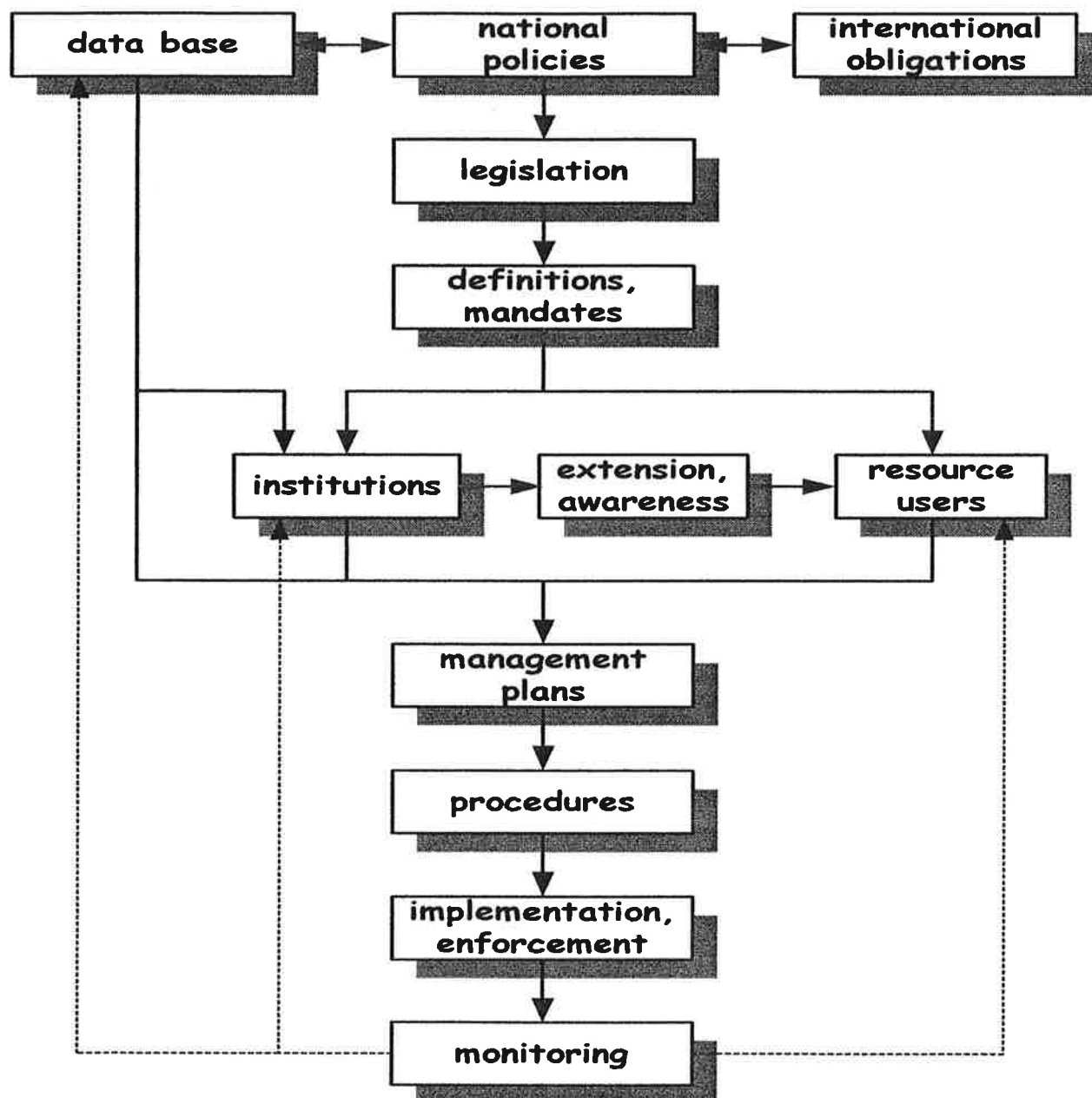


Table 2 - Natural resource management model

NATURAL FLORA	COASTAL/MARINE - PROTECTED AREAS
MEDICINAL PLANTS	COASTAL/MARINE - WETLANDS
FORESTRY - PRODUCTION FOREST	COASTAL/MARINE - TRADE IN SPECIES
FORESTRY - PROTECTION FOREST	BIODIVERSITY - HABITATS/ECOSYSTEMS
FORESTRY - MANGROVES	BIODIVERSITY - GENETIC POOL
FORESTRY - COMMUNITY FOREST	SURFACE WATER - QUANTITY
FAUNA - TERRESTRIAL VERTEBRATES	SURFACE WATER - QUALITY
FAUNA - TERRESTRIAL INVERTEBRATES	GROUNDWATER
FAUNA - AQUATIC (FRESHWATER)	LAND USE PLANNING
PROTECTED AREAS	SOLID WASTE/SOIL POLLUTION
ECO-TOURISM	WATERSHEDS
COASTAL/MARINE - CORAL REEFS	AIR QUALITY
COASTAL/MARINE - FISHERIES	ENERGY (FROM NATURAL RESOURCES)

Table 3 - Natural resource categories, as commonly used in Sri Lanka

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES						
RESOURCE:						
	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organisation al framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base						
National policy						
Internat. obligations						
Legislation						
Definitions, mandates						
Institutions						
Extension, awareness						
Resource users						
Management plans						
Procedures						
Implementation						
Monitoring						

Table 4 - Resource management data sheet

2.3 Analysis of information

2.3.1 Analysis of technical information

For the examination of the technical information in the data matrices the *SWOT analysis* was used. SWOT is the acronym for *Strengths*, *Weaknesses*, *Opportunities*, *Threats*. Although designed to analyse an organisation, it can be well adapted for the analysis of sectoral management, by examining its internal strengths and weaknesses, and external opportunities and threats. The factors “S” and “O” are positive factors contributing to the functioning of management, the factors “W” and “T” are barriers to be overcome.

The factors were extracted from the data sheets, discussed, and summarised in as few as possible elements. These were transferred to a matrix structure as shown in Table 5, in which crosses were placed where the elements were thought to reinforce or reduce each other. The matrix fields with crosses were subsequently paraphrased into a list of “issues (needs) to be addressed”.

For the purpose of the present Study two combinations of matrix fields were expected to disclose **main issues** for the (sub-) sector concerned:

- the matrix fields in which strengths are reduced by threats (since interventions to lower the threat might save a resource or its management before it is too late);
- the matrix fields in which weaknesses may be reinforced by opportunities (since interventions to use the opportunity might eliminate the weakness).

When strengths and opportunities reinforce each other, generally no interventions are required; when weaknesses and threats reinforce each other interventions might most probably be too late, too costly, or otherwise not feasible.

		opportunities			threats		
		A	B	C	X	Y	Z
strengths	1						
	2						
	3						
	I						
	II						
	III						

Table 5 - Basic framework for SWOT analysis

2.3.2 Analysis of institutional information

For the analysis of institutional information use was made of the “*Matrix for Stakeholder Analysis*” (MSA), a simple tool, charting out the specific manner in which stakeholders hold their stakes. The purpose of MSA is:

- to clarify the roles and responsibilities of different agencies active in the same (sub-)sector;
- to determine possible overlaps or inconsistencies in the distribution of roles;
- to identify areas where co-ordination or collaboration needs to be strengthened;
- to identify stakeholders who are insufficiently involved.

Application of MSA to natural resources management would in fact require a workshop session for each of the resources concerned, with representatives of all stakeholder levels. This was not possible within the time frame of the Study. Therefore the same mechanism was used as for technical data collection: a matrix was prepared in which the main resource management responsibilities were indicated (Table 6), and IUCN staff was requested:

- to list the stakeholders in management of a particular resource;
- to indicate their present relation to the responsibilities (with crosses in one colour); and
- to indicate the “ideal” situation (with crosses in the same fields, but in another colour).

MATRIX FOR STAKEHOLDER ANALYSIS IN NATURAL RESOURCES MANAGEMENT

RESOURCE:

ACTIVITY STAKEHOLDER	policy setting	legis- lation, rules	extens- ion, PA	planning	budget -ting	data collect- ion	data base mgmt	imple- mentat -ion	enforce -ment	coordi- nation	monitor -ing
A											
B											
C											
etc.											

FILL IN MATRIX:

STEP 1: - indicate (in blue) the actual situation, who is involved in what

STEP 2: - indicate (in red) the "ideal" situation, who should be involved in the specific activity concerned

ANALYZE MATRIX:

STEP 3: - are the appropriate stakeholders involved in the activity?

STEP 4: - are the institutions concerned adequately equipped for the specific activity? (if they have to do, can they do it with the present mandate, staff, structure, infrastructure, and finances?)

STEP 5: - for tasks covered by more than one institution: are there sufficient structures for conflict management, communication, collaboration and co-ordination?

Table 6 - Matrix for stakeholder analysis

The matrices were discussed in the team, and amended where needed. The next steps in the analysis are indicated in Table 6. By comparing the two colours it can quickly be determined how distant “actual” and “ideal” situations are, and where the main institutional weaknesses are. It can also be determined whether incomplete coverage of responsibilities is expected to be due to shortage in human, financial or material resources. And finally, in situations where responsibilities are shared, it can be determined whether organisational mechanisms are available to optimise co-operation and to prevent conflicts.

Using the stakeholder analysis would ideally require input from more people than a project team; certainly stakeholder lists were incomplete, and responsibility indications biased towards individual opinions. But for the purpose of contouring the general state of affairs, the approach was considered adequate; analysis of the matrices is expected to disclose main issues to be addressed to improve the overall performance of the sector and its (sub-)sectors.

2.4 Prioritisation of issues

Once a list of issues was extracted from the SWOT and stakeholder analyses, the next actions were to take out repeating issues, to combine issues requiring a more or less identical intervention, and to prioritise them. Whereas the first two actions could easily be carried out by the Study team, more outside input was required for prioritising. Although it could be seen immediately that dealing with some of the issues would have a wider or more immediate positive effect than dealing with others, the intricate institutional set-up of resources management in Sri Lanka would easily lead to more attention paid to compartmentalised issues than to cross-cutting ones.

There is another reason to involve more parties in prioritisation of issues. Donor agencies have often played a rather central role in selection of goals and interventions, resulting in issues that are highly reflective of donor perceptions and overly ambitious. The result can be a confusing and unproductive split between the formal world of project design, and the “real” world, in which local agendas are made explicit. The ambitious characters of the goals of interventions lead to promises and statements of intent that momentarily sound good, but that soon create a situation where performance falls short of plans and where regular attempts are made to force local partners back into the straight jacket of project design. This is an unproductive situation for all.

Successful interventions, on the other hand, take (selected) local priorities as their starting point. Within a mutually agreed framework (here: management of natural resources) specific, tangible interests are accepted as the basis for project design. This does not necessarily mean that such interests are the ultimate goal of the intervention, or that in the course of the intervention no new elements can be added. But it does mean that local priorities get the status they deserve.

To optimally build in local priorities in the list of resource management issues, and also to prevent later disagreement with prioritisation, it was decided to use the mechanism of a “*consensus-building workshop*” for this purpose: a meeting of high-level stakeholders in management of the various resources, with the intention to prioritise the main issues in a participatory exercise. In the workshop Study team members explained how the list of issues was determined, after which the workshop participants were given the matrix shown in Table 7. They were requested to give the ten issues that are most important in their perception a number between 1 and 10, whereby every number could be given only once. This exercise was repeated three times, following the three right-hand columns in Table 7, as follows:

PRIORITIZATION OF ISSUES TO BE ADDRESSED

Please select which ten issues you consider most relevant, most urgent, and most feasible for improvement or strengthening of resources management, and rate them with the figures 10 (most important), 9, 8, 7, 6, 5, 4, 3, and 2. You may use each of these figures only once in each of the columns. Please indicate for the remaining seventeen issues in each column whether you consider them as important (with a "1") or not important (with a "0").

Nr	ISSUE	RELEVANCE	URGENCY	FEASIBILITY
x			
y			
z			

Relevance: *significance of issue for adequate management of the resources concerned*

Urgency: *order of addressing the issues to safeguard the resources concerned*

Feasibility: *possibility to deal with the issue*

Table 7 - Matrix for participatory prioritisation of issues

- for the **relevance** of the issue for improvement of overall or specific resource management in the country (is it in agreement with government policies, and is it more important than other issues?);
- for the **urgency** with which this issue has to be addressed (is dealing with this issue earlier needed than with other issues?);
- for the **feasibility** to deal with the issues (is it easier to successfully address this issue than other issues?).

The participants were also requested to give the number 0 (zero) in the relevance column to those issues they consider of no importance at all. Issues without any number were considered important, but less so than the top ten.

After the exercise, figures from the individual matrices and from the three columns were added, leading towards a priority order of issues, in which importance, urgency and the practicability to deal with them were combined.

2.5 Analysis of issues

The priority list of issues to be addressed in order to improve or facilitate the management of natural resources in Sri Lanka was subsequently confronted with two sets of documents:

- The *Netherlands policies on environmental management and on development co-operation*. For this purpose, use was made of the following publications:
 - ⇒ Anon., 1998. (Netherlands) National Environmental Policy Plan 3, the Summary, 57 pp;
 - ⇒ Herfkens, E., 1999. Letter to the Lower House of the Dutch Parliament on the impact of country policy on bilateral aid. Mimeo, 10 pp.

- sample 80-800
- ⇒ Ministerie van Buitenlandse Zaken, 1999. Begroting Buitenlandse Zaken 2000 ("Budget Ministry of Foreign Affairs, 2000). 106 pp + annexes;
 - ⇒ Ministry of Foreign Affairs, 1999. Netherlands Development Assistance 1998-2000. 20 pp.

For each of the priority issues it was indicated whether addressing them would be in line with published Dutch policies, in order to indicate that they would in principle be eligible for interventions.

- Those *pipeline projects of the main international financing agencies* ADB and WB that are related to management of natural resources. For this purpose, use was made of the following resources:
 - ⇒ WB, 1999. Review of donor assistance to environmental areas in Sri Lanka, 14 pp + ann.
 - ⇒ ADB, 1999. Detailed processing schedules of 2000 loans/TAs - Sri Lanka, 2 pp.
 - ⇒ the set of project documents, draft project documents, and memoranda of understanding, present at the RNE;
 - ⇒ telephone interview with the national WB staff member responsible for natural resources management, Mr Sumith Pilapitiya;
 - ⇒ discussions with team leader of the ADB appraisal mission for PAMWCP, Mr Philip Dearden;
 - ⇒ telephone interview with ADB staff member preparing the Water Resources Management Project, Mr Peter Logan;
 - ⇒ interview with Team leader PAMWCP appraisal mission.

For each of the priority issues it was indicated in which of planned loan and TA projects they would be addressed, in order to indicate that these (sub-) projects would in principle be eligible for Dutch co-financing.

The priority issues that were in principle considered acceptable for financial support were subsequently analysed for their relation and compatibility with others in the list. Suitable issues were combined, and recommendations were prepared regarding potential further arrangements.

= add background

3 RESULTS

3.1 Data analysis

3.1.1 Categorisation of resources

The commonly used categorisation of the resources of Sri Lanka is shown in Table 3. This categorisation is based more on traditional division of responsibilities between or inside agencies, rather than on conformity in management principles. For example, the management of plant and animal species requires a different approach than the management of complete ecosystems or protected areas.

In order to be able to understand major issues in resources management, the resources were re-arranged as shown in Table 8, combining those resources requiring common or comparable general management principles in the same (sub-)category. As far as physical resources are concerned the commonly accepted division into "land", "water" and "air" is used, but quantitative and qualitative aspects are combined, since management of one has a bearing on the other. For the biological resources a logical sub-division was made, based upon the level of involvement of interests in management:

CATAGORIZATION OF NATURAL RESOURCES MANAGEMENT USED IN THE ANALYSES

A BIOLOGICAL RESOURCES

A1 SPECIES AND POPULATION MANAGEMENT

- *Natural flora*
- *Natural fauna (terrestrial and aquatic)*
- *Biodiversity*
- *Genetic pool*

A2 ECOSYSTEMS AND HABITAT MANAGEMENT

- *Protected areas, protection forestry, habitats, landscapes*
- *Coastal wetlands, mangroves*
- *Coral reefs*

A3 EXPLOITATION MANAGEMENT

- *Medicinal plants*
- *Forestry (production forest, community forest, agroforestry)*
- *Fisheries, trade in aquatic species*
- *Eco-tourism, multiple use of Protected Areas*
- *Green energy*

B PHYSICAL RESOURCES

B1 LAND RESOURCES MANAGEMENT

- *National land use planning*
- *Regional land use planning (by watershed, by administrative division)*
- *Quality control (solid waste, pollution, fertility)*

B2 WATER RESOURCES MANAGEMENT

- *Surface water quantity*
- *Surface water quality*
- *Groundwater*

B3 AIR QUALITY MANAGEMENT

Table 8 - Categorisation of resources and resource use management used in the analyses

- a first sub-category (at the species, populations and biodiversity level) in which mainly biological/ecological interests are at stake;
- a second sub-category (at the ecosystems, habitats and protected areas level) in which physical planning and land use interests play an important role;
- a third sub-category (at the resource exploitation level), where socio-economic interests are added as well.

The categories of Table 8 will be used in further analyses; this will result in identification of major issues only, irrespective of the present resource management responsibilities and of detailed resource-specific issues.

3.1.2 *SWOTs*

The matrices with the data collected from references and interviews are presented in *Annex C*. All information from these data matrices was processed into lists of SWOT components: internal Strengths and Weaknesses of the sub-sector, and outside opportunities for, and threats to the sub-sector. Subsequently, these lists were compacted by combining comparable items, and by deleting items that could be considered inherent to another item of higher magnitude. The remaining items were inserted into the SWOT matrix, and crosses were placed in the areas where internal strengths are considered to be weakened by outside threats, and where internal weaknesses could be reinforced by outside opportunities. Finally, the crosses were paraphrased into “main issues to be addressed”.

The results of the SWOT analysis are presented in the following Tables:

- Table 9: SWOT matrix and resulting list of issues for category A1: Species and Population management (flora, fauna, and biodiversity);
- Table 10: SWOT matrix and resulting list of issues for category A2a: Ecosystem and Habitat management (ecosystems, habitats, and protected areas);
- Table 11: SWOT matrix and resulting list of issues for category A3a: Exploitation management - forestry
- Table 12: SWOT matrix and resulting list of issues for category A3b: Exploitation management - fisheries
- Table 13: SWOT matrix and resulting list of issues for category A3c: Exploitation management - eco-tourism
- Table 14: SWOT matrix and resulting list of issues for category B1: Land resources management (land, land use, and soil quality)
- Table 15: SWOT matrix and resulting list of issues for category B2: Water resources management (water quantity and quality);
- Table 16: SWOT matrix and resulting list of issues for category B3: Air quality management.

The methodologies used and the main issues resulting from the SWOTs were discussed with high-level officials from the institutions concerned during a series of meetings. In general consent was obtained.

**SWOT analysis for management of A1:
FLORA, FAUNA, and BIODIVERSITY**

	interest from universities	NEAP recomm. central data base	interest from NGOs	some donor interest	tourist interest	invasive plants	hunting/collection/trade	development activities	pest management	quarter of plant spp near extinction
high diversity, endemism						X	X	X	X	X
generally adequate data										
adequate legislation, EIA								X	X	
buddhist tradition							X	X	X	
overlap mandates institutions				X						
lack of management co-ordination		X		X						
data not centralized		X								
inadequate creation of awareness			X	X	X					
inadequate monitoring	X	X								

MAIN ISSUES CATEGORY A1 - FLORA, FAUNA and BIODIVERSITY:

- need for a strategy and action plan to cope with invasive plant species
- need to review and streamline mandates of institutes involved
- need for an institutional mechanism for co-ordination between institutes
- need for establishment of a central data bank (NEAP)
- need for relation between data bank and EIA procedures
- need for central monitoring of flora and fauna
- need for creation of awareness on biodiversity
- need for central training on monitoring/enforcement/data collection/licensing

Table 9 - Results of SWOT analysis for category A1: Species and Populations Management

**SWOT analysis for management of A2:
ECOSYSTEMS, HABITATS, and
PROTECTED AREAS**

	opportunities						threats			
	dev. of eco-tourism, cost recovery	development management models	stakeholder/NGO interest in co-operation	some donor interest: ADB projects	interest private sector/licensing	plans for expansion area/corridors	no national land use plan	over-exploitation (grazing, mangroves, corals)	encroachment/settlement	development pressure (habitat destruction)
high diversity, extensive area							X	X	X	X
policies, action plans in place								X	X	X
Env. Info Mgmt in place (FD only)								X	X	
various management plans available							X	X	X	
high boundary-area ration (small pockets)				X		X				
weak law enforcement			X		X					
high costs of management/enforcement	X	X	X	X	X					
overlap institutional mandates		X		X						
low co-ordination agencies (NWSC)		X		X		X				
no institutional logic PAs, prot. forest, SAM				X						
insufficient infrastructure, equipment	X			X	X					
legislation needs harmonization, adaptation				X						
no site-specific management		X	X		X					
not enough trained staff	X			X						
insufficient infrastructure	X				X					
no structured co-ordinative monitoring		X	X	X						

MAIN ISSUES CATEGORY A2 - ECOSYSTEMS, HABITATS and PROTECTED AREAS:

- *need for review and streamline mandates of institutes involved*
- *need for an institutional mechanism for co-ordination between institutes*
- *need for harmonisation of policies for the sub-sectors (PAs, Protected forests, SAMs)*
- *need for land use plan at national level*
- *need for zoning and corridor development*
- *need for improvement and harmonisation of legislation*
- *need for conditional involvement of private sector in management and services*
- *need for development of cost-recovery systems in protected area management*
- *need for field introduction of participatory management*
- *need for development and enforcement of licensing systems*
- *need for replication of successful models*
- *need to bring downstream protected area interests in EIA procedures*
- *need for co-operative awareness efforts on effects of exploitation*
- *need for national monitoring plan (agencies, stakeholders, NGOs)*
- *need for central training on monitoring/enforcement/data collection/licensing*

Table 10 - Results of SWOT analysis for category A2: Ecosystems and Habitats management

**SWOT analysis for management of A3a:
EXPLOITATION MANAGEMENT -
FORESTRY**

		opportunities					threats				
		plans to decentralize planning (participatory)	plans to decentralize mgmt (partnerships)	promotion of agroforestry	potential higher production plantation sector	donor interest (ADB, FAO)	declining forest cover and overexploitation	increased demand for wood/wood products	hydrology increasingly out of balance	increased exploitation of protection forest	chena system
Strengths	national forestry policy and master plan						X	X	X	X	X
	large areas of state plantations							X	X		X
	internal wish to improve performance							X	X	X	X
	established authority of FD						X			X	X
	importance forest cover to prevent erosion						X	X		X	X
	no clear land use plans/demarcations	X	X								
	production data base not in one hand				X	X					
	inadequate enforcement of rules		X			X					
	state plantations produce under potential				X	X					
	confusion on forest categories definition	X	X	X		X					
Weaknesses	no relation betw. costs/income producers	X	X	X		X					
	mainly transport-based regulatory system		X								
	tree tenures unclear	X	X	X							
	lack of trained staff at field level	X			X	X					
	inadquate monitoring of illegal felling	X	X	X							

MAIN ISSUES CATEGORY A3a - EXPLOITATION MANAGEMENT - FORESTRY:

- *need to reformulate and simplify forestry legislation and procedures*
- *need for more equitable power and benefits sharing between FD and producers (partnerships)*
- *need for management planning (including area demarcation) with community participation*
- *need to decentralise forestry management, with clear functional responsibilities*
- *need to improve the production management of plantations*
- *need to redefine the role of the STC*
- *need to bring forestry data banks in one hand (combine data of FD, STC, NARA)*
- *need to promote agroforestry, community forestry*
- *need to improve the exploitation management of community forests*
- *need to bring mangrove management fully under FD*
- *need to eliminate the chena cultivation system*
- *need for training of FD staff at regional level*

Table 11 - Results of SWOT analysis for category A3a: Exploitation management - Forestry

**SWOT analysis for management of A3b:
EXPLOITATION MANAGEMENT -
FISHERIES**

	planned infrastructure development	more co-operation M/FAR and fishermen	development of aquaculture	donor interest	overexploitation marine and fresh waters	sales on full sea	
international conventions					X	X	
relatively large EEZ						X	
large demand for fisheries products					X	X	
no national fisheries policy		X	X	X			
no data base for resource mgmt planning		X		X			
no stock-assessment-based exploitation				X			
low enforcement of rules and regulations		X					
shortage of on-land facilities	X			X			
low post-harvest quality management	X	X	X	X			
no effective use of by-catch	X	X	X	X			
no pollution control regulations		X		X			

MAIN ISSUES CATEGORY A3b - EXPLOITATION MANAGEMENT - FISHERIES:

- need for regulations for fisheries resources management
- need for development of a routine stock assessment system
- need for development of fisheries statistics, based upon a general catch monitoring and data collection system
- need to improve post-harvest fish quality management
- need to improve procedures for removal of fish offal, waste, motor oil
- need for participatory management planning inland water fisheries
- need for improved monitoring of the ornamental fish trade

Table 12 - Results of SWOT analysis for category A3b: Exploitation management - Fisheries

**SWOT analysis for management of A3c:
EXPLOITATION MANAGEMENT - ECO-
TOURISM**

		Opportunities						
		return on conservation investments	additional rural employment generation	additional revenue/foreign currency	marketing, promotion	exceeding of carrying capacities	spot damages and impacts	tourist safety considerations
	wish to develop eco-tourism					X	X	
	increased tourist arrivals							X
	private sector interest					X		X
	income state sector flows to treasury			X	X			
	no zoning in protected areas				X			
	no co-ordination tourism/protection author				X			
	low development visitor info facilities	X	X					
	low development eco-tour. infrastructure	X	X		X			

MAIN ISSUES CATEGORY A3c - EXPLOITATION MANAGEMENT - ECO-TOURISM:

- need for eco-tourism strategy, including actions required
- need for integrated tourism development planning
- need to determine carrying capacity of protected areas
- need for zoning plans in protected areas suitable for eco-tourism
- need for development of codes of conduct for tourists in nature areas
- need to establish improved cost-recovery plans for protected areas

Table 13 - Results of SWOT analysis for category A3c: Exploitation management - Eco-tourism

**SWOT analysis for management of B1:
LAND, LAND USE, and SOIL QUALITY**

SWOT analysis for management of B1:
LAND, LAND USE, and SOIL QUALITY

	opportunities	threats
	watershed-based planning coming up national solid waste strategy in NEAP private sector interest in solid waste mgmnt site for sanitary landfill being selected integrated pest management being developed include cost of erosion in development plans increasing interest in re-use, recycling long-term lease agricultural land coming up GIS equipment/specialists available decentralized planning without national basis erosion/degradation/top soil loss agriculture in hilly lands illegal encroachment, settlement	
draft land use policy available (LUPPD)		X
indicative land use plans at division. level		X
EIA procedures in place		X
presidential task force solid waste		X
solid waste data base for Colombo		X
absence of national land use plan		X
no cadastral data bank; no land titling	X	X
too many agencies involved in land use	X	X
divisional boundaries not watershed-based	X	X
no soil conservation policy, legislation	X	X
no national solid waste policy, legislation	X	X
low enforcement EIA provedures	X	X
no hazardous waste treatment facility	X	X
farmers do not invest (short lease)	X	X

MAIN ISSUES CATEGORY B1 - LAND, LAND USE AND SOIL QUALITY:

- *need for a national land use plan, including regional guidelines*
- *need for an institutional mechanism for co-ordination between institutes*
- *need for harmonisation of land use policies of all agencies involved in land planning and allocation*
- *need for a soil conservation policy and legislation*
- *need for property registration and land titling*
- *need for a national solid waste policy and legislation*
- *need for a policy on agricultural land use in hilly lands*
- *need for phasing out of short-term lease agreements*
- *need for co-ordination of collection, recycling and disposal of solid waste*
- *need for selection of sites for sanitary landfill*
- *need for construction of a hazardous waste treatment facility*
- *need for introduction of integrated pest management and pesticide use monitoring*
- *need to simplify and shorten legal procedures in pollution cases*
- *need to train divisional authorities on watershed-related land use*

Table 14 - Results of SWOT analysis for category B1: Land resources management

**MAIN ISSUES CATEGORY B2 - SURFACE WATER and GROUNDWATER
QUANTITY and QUALITY:**

- *need for ratification of the draft National Water Resources policy*
- *need to finalise the National Water Resources Act*
- *need for establishment of a single body to manage supply and use of surface and groundwater*
- *need for fast establishment of National Water Resources Authority*
- *need to provide the National Water Resources Authority with the power to overrule other agencies in (potential) water allocation conflicts*
- *need to develop a national groundwater data base and extraction/use policy*
- *need to design principles of water allocation to different users*
- *need for improved efficiency of water use*
- *need to promote rain water harvesting systems*
- *need for creation of water user organisations*
- *need for a public awareness programme on water quantity and quality issues*
- *need to control floating aquatic weeds*
- *need to promote development of alternative sources of energy*
- *need to increasingly replace rice by less water consuming crops*
- *need for reforestation of upper watersheds*
- *need for an improved water quality monitoring programme (surface and ground water)*
- *need for provision of water quality equipment and training at regional level*
- *need to establish water quality standards for stream flows and for groundwater*
- *need to shorten and simplify legal procedures regarding pollution*
- *need to concentrate industries requiring similar waste water treatment (easier technology and lower common investments)*
- *need for promotion of environmental audit systems for industries*
- *need for stricter adherence to EIA regulations and procedures*

Table 15 - Results of SWOT analysis for category B2: Water resources management

**SWOT analysis for management of B3:
AIR QUALITY**

		Opportunities				Threats			
		tuning of engines (diesel)	decrease of diesel incentives	installation pollution reduction equipment	establish twinning arrangements	public complaints re. higher costs	public health problems (WHO norms)		
	national policy, action plan in place					X	X		
	legislation, standards, procedures in place					X	X		
	data base not adequate							X	
	equipment not adequate	X		X	X	X	X		
	low staff capabilities	X			X				
	procedures, measures not implemented	X							
	too strong Colombo focus	X							
	low co-ordination responsible institutions	X	X	X	X				
	no adequate awareness programme	X	X						
	haphazard air quality monitoring	X		X	X				

MAIN ISSUES CATEGORY B3 - AIR QUALITY:

- need for an institutional mechanism for co-ordination between institutes
- need for installation of monitoring equipment
- need for extensive public awareness programme (health risks, state costs, measures)
- need for country-wide policy and action plan
- need for establishment of twinning arrangement
- need for central training on monitoring/enforcement
- need to phase out diesel fuel incentives for vehicles

Table 16 - Results of SWOT analysis for category B3: Air quality management

3.1.3 *Matrices for stakeholder analysis*

The results of the matrices for stakeholder analyses (MSA) are presented in *ANNEX D*. The processing of these data proved to be less straightforward than that of the SWOTs, due to the fact that there proved to be substantial differences of opinion on the level of stakeholder involvement. Some members of the team who undertook the exercise were of the opinion that every stakeholder should be fully involved in all aspects of resource management, whereas others took a more restricted stand, especially regarding management components for which substantial professional input or experience was required. As a consequence, only very general issues could be extracted from the matrices, and most of these were already concluded from the SWOT analyses. The results are summarised in Table 17.

MAIN ISSUES RESULTING FROM THE STAKEHOLDER ANALYSES:

A: BIOLOGICAL RESOURCES MANAGEMENT:

- *co-ordination between stakeholders in management planning and implementation is inadequate*
- *local level authorities and communities are hardly involved in preparation of management plans, but are expected to be fully involved in their implementation*
- *many stakeholders collect data on resources and resource use, but data management is lacking*
- *inadequately co-ordinated monitoring, resulting in lack of feed-back mechanisms*
- *stakeholders involved in policy setting, legislation, and planning are often different from those involved in extension and awareness creation*

B: PHYSICAL RESOURCES MANAGEMENT:

- *involvement of water users (all levels) in management planning and in setting of rules is inadequate*
- *involvement of land users in virtually all aspects of land/soil management is inadequate*
- *co-ordination between stakeholders in land use planning, implementation, law enforcement, and monitoring is lacking*
- *many stakeholders are involved in policy setting, planning and data collection for air quality management, but co-ordination is inadequate, and implementation is lacking*

Table 17 - Main issues extracted from the matrices for stakeholder analysis

3.1.4 *Listing of issues*

All issues identified in the SWOT and stakeholder analyses were subsequently consolidated in one list. This list of *some 100 issues* was shortened in three steps:

- firstly, all issues with a more or less identical meaning, stemming from different analyses, were combined, and rephrased in a way that the resulting issue showed significance;
- secondly, issues concerning species or populations were all considered to be secondary to (or a consequence of) resource exploitation;

- thirdly, issues related to subordinate aspects of resource management were included in issues of a wider scope, if available. The wider scope could mean that the original issue had value for management of more than one resource (e.g. central training), or that related management components could be combined into one issue (e.g. extension and awareness), or that dealing with the issue could be considered a logical consequence of dealing with another issue with higher hierarchy (e.g. regulations as a consequence of developing legislation).

This concentration of issues led to two new lists with some 40+ issues in total; one list with issues of a general nature (cross-sectoral issues, or issues with significance for management of all natural and physical resources), and one list with issues of a more specific character. These new lists are shown in Tables 18 and 19, and were used in the consensus-building workshop.

MAIN CROSS-CUTTING ISSUES (ALL RESOURCES)

- *reviewing, streamlining and harmonisation of mandates of institutions and stakeholders involved in resources management*
- *assessment and, where necessary, creation of institutional mechanisms for improved co-ordination and elimination of competition between stakeholders in management*
- *creation of cross-linkages between national/provincial/regional level planning and sectoral level planning*
- *bringing natural resource management institutions under one ministry*
- *development and introduction of participatory resources management (partnerships with clear functional responsibilities, equitable power, and sharing of benefits), or replication of existing models*
- *establishment of twinning arrangements in resources management (institutions elsewhere, international NGOs)*
- *reformulation and simplification of policies, legislation, legal procedures, and enforcement procedures, and harmonisation of those for the various sub-sectors*
- *elimination of mismatches between stated and implemented policy*
- *decrease of the uneven distribution of the human population*
- *provision, at all levels of society, of more education and public awareness on resources (limitations, health risks, state costs, measures)*
- *establishment of a central training system for aspects of resources management (planning, partnerships, data collection and management, licensing, enforcement, monitoring)*
- *centralisation and improvement of collection/management of data, and of monitoring*
- *involvement (under conditions) of the private sector/cost recovery systems in management and services*
- *discouragement or encouragement of (ir)responsible use of natural resources through taxes or subsidies*

Table 18 - Consolidated list of main cross-cutting issues

MAIN SPECIFIC ISSUES

- *harmonisation of the extent and distribution pattern of protected areas with actual management capacities*
- *determination of the carrying capacities of protected areas*
- *increase of the sustainability of protected areas through zoning and corridor development*
- *preparation of an eco-tourism strategy, including actions and budgets required*
- *improvement of productivity of plantations*
- *promotion and improvement of agroforestry and community forestry*
- *formulation of a strategy and action plan to cope with invasive plant species*
- *establishment of a sustainable fisheries management system (stock assessment, regulations, data collection and management)*
- *improvement of fisheries post-harvest procedures (quality management; offal and waste processing)*
- *improvement of monitoring of the ornamental fish trade*
- *preparation of a national land use plan, including regional guidelines (watershed- or river basin-based)*
- *preparation of a soil conservation policy and regulations, including solid waste management and agricultural land use regulations*
- *establishment of property registration/taxation and a land titling system*
- *phasing out of short-term lease agreements of land to facilitate long-term investments*
- *ratification of the draft National Water Resources policy and finalisation of the National Water Resources Act*
- *establishment of water quality standards for stream flows and for groundwater*
- *improvement of water use efficiency (domestic, irrigation)*
- *step-wise replacement of rice by less water consuming crops*
- *promotion and stimulation rain water harvesting*
- *promotion of the development of alternative sources of energy*
- *preparation of a country-wide policy and action plan for air quality management*
- *introduction of systems to decrease exhaust gas pollution*
- *concentration of industries requiring similar effluent and waste treatment*
- *promotion of environmental self-audit systems for industries*
- *introduction of a strict pesticide use regulation, based upon integrated pest management*
- *establishment of facilities/sites for sanitary landfill and hazardous waste treatment*
- *streamlining of EIA procedures*

Table 19 - Consolidated list of main specific issues

3.2 Consensus-building workshop

3.2.1 Participation

For the workshop top-level participants were invited from all institutions with major resource management mandates, from the large international donors, and from the main national and international NGOs active in the environmental sector. Participants and their sectoral positions are listed in alphabetical order in Table 20, the agenda is shown in *Annex E*. The participation to the workshop was of a high level and broad (covering most of the natural resources), and may be considered representative of the sector.

No	NAME *)	POSITION
01	Dr Vinya Ariyaratne	Director Sarvodaya Shramadana Movement
02	Dr B.M.S. Batagoda	Director, M/F&E
03	John R. Cooney	Resident Representative ADB
04	Ms Sujatha Cooray	Director, External Resources Department
05	L.P.D. Dayananda	Programme Co-ordinator, IUCN
06	G. Geut	Sector Specialist, RNE
07	A.P.A. Gunasekara	Director, DWLC
08	H.G. Gunawardena	Deputy Conservator of Forest
09	S. Haputantri	Director, M/Agriculture and Lands
10	B. J. Hennadige	SPO, RNE
11	H.M.B.C. Herath	Addl. Director, DWLC
12	L. Hewapathirana	Director, World View Sri Lanka
13	J. Jayasinghe	Director, Land Use Policy Div., M/A&L
14	L. Jayasinghe	Director-General, CEA
15	M.A. Kumaradasa	Director Planning, M/F&E
16	P. Kuperus	Dy. Head of Mission, RNE
17	Ms Kseniya Lvovsky	Sr. Environmental Economist, WB
18	Dr N. Pallewatta	Dy. Regional Biodiversity Officer, IUCN
19	H.N.R. Perera	Director, CCD
20	D. Pieris	Manager, Ceylon Chamber of Commerce
21	S. Pilapitiya	Sr. Engineer Energy & Environment, WB
22	G. Piyasena	Director Planning, M/F&R
23	S. Ranawana	Project Specialist, ADB
24	H. Rolloos	Co-Team leader IRMP, CEA
25	M. Wickremage	Director, National Water Secretariat
26	Ms S. Yasaratne	Country Representative, IUCN Sri Lanka
*) + 4-5 non-registered		

Table 20 - Participants of the consensus-building workshop (in alphabetical order)

After introductions by Mr Peter Kuperus (Head, Development Co-operation, RNE) on the background and objectives of the present study and on the data collection component by Mrs Shiranee Yasaratne (Country Representative, IUCN), the actual prioritisation process commenced.

3.2.2 Prioritisation of issues

Participants were given forms, as described in section 2.4. All listed issues were shortly discussed, and the system of rating was explained. After rating the forms were collected, and the ratings added. The resulting priority listing, in descending order of importance, is shown in Tables 21 and 22.

<i>No</i>	<i>CROSS-CUTTING ISSUES</i>	<i>Rel</i>	<i>Urg</i>	<i>Feas</i>	<i>Total</i>
01	• <i>creation of cross-linkages between national/provincial/regional level planning and sectoral level planning</i>	121	104	121	346
02	• <i>creation of institutional mechanisms for improved co-ordination and elimination of competition between stakeholders in management</i>	111	101	89	301
03	• <i>reviewing, streamlining and harmonisation of mandates of institutions and stakeholders involved in resources management</i>	98	94	92	284
04	• <i>development and introduction of participatory resources management (partnerships with clear functional responsibilities, equitable power, and sharing of benefits), or replication of existing models</i>	88	86	93	267
05	• <i>provision, at all levels of society, of more education and public awareness on resources (limitations, health risks, state costs, measures)</i>	69	73	100	242
06	• <i>reformulation and simplification of policies, legislation, legal procedures, and enforcement procedures, and harmonisation for various sub-sectors</i>	74	80	81	235
07	• <i>elimination of mismatches between stated and implemented policy</i>	75	85	59	219
08	• <i>involvement (under conditions) of the private sector/cost recovery systems in management and services</i>	60	56	47	163
09	• <i>discouragement or encouragement of (ir)responsible use of natural resources through taxes or subsidies</i>	57	52	52	161
10	• <i>centralisation and improvement of collection/management of data, and of monitoring</i>	32	37	39	108
11	• <i>establishment of a central training system for aspects of resources management (planning, partnerships, data collection and management, licensing, enforcement, monitoring)</i>	28	44	29	101
12	• <i>bringing natural resource management institutions under one ministry</i>	35	30	18	83
13	• <i>establishment of twinning arrangements in resources management (institutions elsewhere, international NGOs)</i>	21	13	33	67
14	• <i>decrease of the uneven distribution of the human population</i>	17	11	6	34

Table 21 - Results of prioritisation of cross-cutting issues

No	SPECIFIC ISSUES	Rel	Urg	Feas	Total
01	• preparation of a national land use plan, including regional guidelines (watershed- or river basin-based)	180	162	158	500
02	• preparation of a soil conservation policy and regulations, including solid waste management and agricultural land use regulations	119	122	129	370
03	• increase of the sustainability of protected areas through zoning and corridor development	114	124	93	331
04	• ratification of the draft National Water Resources policy and finalisation of the National Water Resources Act	87	111	100	298
05	• preparation of an eco-tourism strategy, including actions and budgets	77	81	127	285
06	• establishment of facilities/sites for sanitary landfill and hazardous waste treatment	82	95	87	264
07	• improvement of water use efficiency (domestic, irrigation)	104	101	58	263
08	• harmonisation of the extent and distribution pattern of protected areas with actual management capacities	98	88	60	246
09	• promotion and improvement of agroforestry and community forestry	72	73	81	222
10	• establishment of a sustainable fisheries management system (stock assessment, regulations, data collection, management)	75	64	77	204
11	• determination of the carrying capacities of protected areas	68	74	59	203
12	• introduction of a strict pesticide use regulation, based upon integrated pest management	68	68	65	202
13	• establishment of property registration/taxation and a land titling system	63	68	61	185
14	• streamlining of EIA procedures	55	54	66	167
15	• improvement of fisheries post-harvest procedures (quality management; offal and waste processing)	59	52	54	165
16	• promotion of the development of alternative sources of energy	59	53	48	160
17	• introduction of systems to decrease exhaust gas pollution	50	51	58	159
18	• preparation of a country-wide policy and action plan for air quality management	57	47	49	153
19	• establishment of water quality standards for stream flows and for groundwater	50	42	58	150
20	• improvement of productivity of plantations	49	43	49	141
21	• promotion of environmental self-audit systems for industries	47	38	47	132
22	• promotion and stimulation rain water harvesting	37	32	56	125
23	• formulation of a strategy and action plan to cope with invasive plant and animal species	41	33	50	124
24	• improvement of monitoring of the ornamental fish trade	32	32	53	117
25	• concentration of industries requiring similar effluent and waste treatment	35	34	42	111
26	• step-wise replacement of rice by less water consuming crops	36	33	36	105
27	• phasing out of short-term lease agreements of land to facilitate long-term investments	30	37	35	102

Table 22 - Results of prioritisation of specific issues

The results of the prioritisation exercise can be summarised as follows:

- all workshop participants filled in the forms, and a general agreement was expressed for the process. There was light criticism regarding the general terms in which some of the issues were expressed, and regarding the fact that the rather long lists might cause some bias towards the first listed issues;
- there were no issues that were not at all rated, illustrating that all of them have at least some relevance for the sector;
- as far as the “general” issues (Table 21) are concerned:
 - ⇒ the first seven issues of Table 21 were rated more or less important by all participants; they can be considered issues of top priority. They have all to do with strengthening institutional mechanisms, but at various levels of resource management. For most of these issues, relevance, urgency and feasibility were considered equally high. Participants considered “better education and awareness” something that should start immediately (high feasibility), whereas the feasibility of co-ordination between institutes as well as elimination of mismatch between stated and implemented policy is seen as relatively low (no direct solutions available);
 - ⇒ the second group of issues (nos. 08 and 09), rated with medium priority, have to do with development of mechanisms to alleviate the financial burden of resources management;
 - ⇒ the third group of issues of Table 21 (the bottom five) were either rated low, or only seen as important by some of the participants. This is a rather surprising result as far as issue 10 (improved data collection, data management, and monitoring) is concerned, since this a basic requirement for improvement of all resource management activities, and was reported ineffective or unsatisfactory in virtually all data sheets. This low rating of typical “field-based” activities might be the result of the fact that most of the workshop participants were administration-directed rather than realisation-directed.
- as far as the more “specific” issues (Table 22) are concerned:
 - ⇒ as could be expected, the rating was more evenly spread over the 27 issues, caused by the fact that virtually all participants rated those related to their own fields of responsibility highest, or at least high;
 - ⇒ one issue came out as “top priority issue”: the preparation of a national land use plan. The workshop participants herewith indicated that they realised that sustainable management of any of the natural resources will only be possible after setting area-based conservation and development objectives, and through aiming at management structures that exceed administrative (divisional, district, and even provincial) boundaries;
 - ⇒ other issues that were rated high (nos. 02-12) were of different character, but all clear-cut. For some of them (protected areas distribution and zoning, improvement of water use efficiency) the feasibility was rated relatively low, indicating that development of mechanisms to deal with those issues should receive high priority. On the other hand, the feasibility of development of an eco-tourism strategy and regulations was rated relatively high, showing that participants expect this to materialise soonest;
 - ⇒ all other issues in Table 22 (nos 13-27) can be considered to have medium priority: the cuts in the table between “high priority”, “medium priority”, and “lower priority” are subjective, and might shift up and down. A striking high priority was given to the “streamlining of EIA procedures”: adequate procedures are in place in Sri Lanka, and streamlining therefore has largely to be considered synonymous with “improved application of existing procedures”;
 - ⇒ as in Table 21, also here a general higher priority was attributed to administration-related issues (planning, policies, strategies), rather than to field-related issues. The fact, however, that some of the field-related issues appear in the upper part of the table (issues 03, 06, 07, 09, 10, 11 and 12) emphasises their significance.

During the workshop, the participants were requested to forward eventual additional issues in a table. Seven tables were received, with one to a few issues each. Subsequent analysis of these issues, however, showed that all of them were either of a too general nature (“sector reform”, “devolution”,

“governance”), or already covered by one of the issues in the lists, or they were earlier considered subordinate to issues in the list, and therefore not included separately. One exception was “stop the depletion of the natural resources (sand, coral) for building material purposes”. The coral part was included in the original long-list of issues, but later considered subordinate to “fisheries management” in general. Sand and other mineral resources (gemstones, ores) were not included in the present study.

3.3 Impact of dealing with issues

During this study, a series of identification and selection processes was used, finally resulting in the priority listing of issues in Tables 21 and 22. Before turning to recommendations for (co-)financing of projects dealing with these issues, their potential impact on the process of natural resources management has to be assessed. An issue can e.g. be marked with high priority, but marking may be biased by general pronounced policy, by general statements, or by unclear formulation or misinterpretation of the issues themselves. To assess their significance for the whole process of resources management, the issues are projected towards the various resource management components (“does dealing with the issue have a direct bearing on this component”) in Table 23.

Those issues expected to significantly improve natural resources management in general (impact on all or most of the process components) are shown *in red* in Table 23. These can be considered issues with the highest “sectoral” impact, in the sense that addressing them will result in positive effects on a number of components (technical and institutional) of the management of one or more natural resources.

It is not surprising, that these “red” issues of Table 23 correspond quite well with the priority listing in Tables 21 and 22. The following notes may be added:

- preparation of an eco-tourism strategy (issue 21-05) was rated high by the workshop participants, whereas its effect on resources management components will be limited. However, one of the components on which the effect may be substantial is “budgeting”: an implemented eco-tourism strategy might well decrease the heavy financial burden for the Government for e.g. park management. Therefore, the high priority rating is acceptable;
- some of the institutional mechanisms identified to improve the overall performance of natural resources management (issue 21-11 - centralised training, and issue 21-12 - institutes under one ministry) were rated somewhat lower by the workshop participants. This could be expected, since both issues are politically loaded, and not wholeheartedly supported by all those presently responsible for (single) resource management. The importance of these two issues for improvement of the performance of the whole sector, however, was stressed also in other documents (NEAP, ADB);
- some of the more technical issues from Table 22 were rated higher by the workshop participants than expected from their potential sectoral impact. Also this is not surprising: solving clear-cut technical issues (ratification of the (existing) national water resources policy, facilities for sanitary landfill, promotion of agroforestry, and others) could be done quickly, and although the overall impact might be relatively low, it shows that “something is done”;
- the promotion of an environmental self-audit system for industries might have a substantial impact on natural resources sustainability and quality, but was rated low, most probably since most workshop participants could not visualise the issue. In Europe, however, such systems (yearly awarded with EU prizes) have proven to be effective.

ACTIVITY ISSUE	policy setting	legis- lation, rules	extens- ion, PA	planning	budget -ing	data collect- ion	data base mgmt	imple- mentat -ion	enforce -ment	coordi- nation	monitor -ing
Table 21-01	X	X	X	X	X	-	-	X	-	X	X
Table 21-02	-	X	X	X	-	X	X	X	X	X	X
Table 21-03	-	X	X	-	X	X	X	X	X	X	X
Table 21-04	-	-	X	X	X	X	-	X	X	X	X
Table 21-05	-	-	X	-	X	-	-	X	X	-	-
Table 21-06	X	X	X	X	-	-	-	X	X	X	X
Table 21-07	-	-	X	X	X	-	-	X	X	X	-
Table 21-08	-	X	X	X	X	X	-	X	X	X	X
Table 21-09	X	X	X	X	X	-	-	X	X	X	-
Table 21-10	-	-	-	X	X	X	X	-	X	-	X
Table 21-11	-	-	X	X	X	X	X	X	X	X	X
Table 21-12	X	X	X	X	X	X	X	X	X	X	X
Table 21-13	-	-	-	X	-	-	X	X	X	X	X
Table 21-14	X	-	-	X	-	-	-	X	-	-	-
Table 22-01	X	X	X	X	X	X	X	X	X	X	X
Table 22-02	X	X	X	X	X	X	X	X	X	X	X
Table 22-03	X	X	X	X	-	-	X	X	X	X	-
Table 22-04	X	X	-	X	X	-	-	X	X	X	-
Table 22-05	X	X	X	X	X	-	-	X	X	X	X
Table 22-06	-	-	-	X	X	-	X	X	X	-	-
Table 22-07	-	-	X	-	X	-	-	X	X	-	X

3.4 Analysis of issues

3.4.1 Conformity with Dutch policies

For testing the conformity of identified priority issues with Dutch policies, two policy statements are relevant:

- the Dutch Environmental Policy, which is mainly directed towards the national environment, but is also considered a framework for international co-operation;
- the Dutch Policy for Development Co-operation.

The *Dutch Environmental Policy* rests on seven main pillars:

- to continuously improve the efficiency with which the environment is used, mainly through effective and long-term resource use planning;
- to make judicious use of science and technology, in order to bring sustainability closer;
- to focus on the quality of the overall living environment, in order to increase support for the overall policy;
- to increase integration and customisation of environmental issues, in order to induce the citizens to assume their responsibilities;
- to internalise environmental costs in prices, in order to encourage citizens to use energy and materials efficiently, and to stimulate a sustainable consumption pattern;
- to improve enforcement, in order to achieve full implementation of policy;
- to step up international activities, especially for reducing global environmental problems.

None of the identified issues contradicts the general Dutch environmental policy; all of the priority issues for natural resources management in Sri Lanka can be related to one of the seven “pillars”, and some even to more than one. Those issues which received highest priority are often very close to the seven “pillars” of Dutch policy: they are e.g. directed towards improved efficiency of the use of the environment, towards increased creation of environmental awareness on the significance of sustainable resources management for the quality of life, or towards improved enforcement.

Increased incorporation of environmental costs in prices of goods and services was not (yet) brought up as an important issue during the present Study, but the intentions to increasingly request payments or incentives for the use of natural resources (eco-tourism) indicate that it will soon become an issue.

The *Dutch Development Co-operation Policy* touches on environmental issues in many instances:

- in the overall programme for development co-operation. The central theme of the overall programme is *sustainable alleviation of poverty*. Poverty alleviation is conventionally measured by income or expenditure level that can sustain a minimum standard of living. Poverty alleviation can also be described, however, in terms of the degree to which basic needs (education, health, housing, safe drinking water, and a clean environment) are fulfilled. Poverty is both a cause and a consequence of environmental degradation; improvements in environmental quality therefore will always reduce poverty.
- in the environmental chapter of the overall programme. Themes are based upon targets set by various international conventions, such as UNCED. Focus is to be on:
 - Climate and energy;
 - Biodiversity, forests, and deserts;
 - Integrated water management;
 - International environmental policies and their instruments.

- in the South Asia chapter of the overall programme. Here one of the focal points is the promotion of regional co-operation.

The approach in Dutch development co-operation will increasingly be “sectoral”, meaning that support will be provided towards coherent and consistent packages of activities, within a clearly defined institutional and budgetary framework, for which the recipient government has formulated specific policies. Important components of any sector are:

- Priority setting. National priorities, expressed in sectoral planning documents, actions (defining priority actions, ensuring effective implementation, involvement of the right actors), budgets, and decentralised capabilities to deal with the actions;
- Policy reform. Market-based policies (cross-sectoral). Legal reform, leading to incentives and regulations, to data collection, and to monitoring;
- Institutional strengthening. Improving performance of public institutions. Capacity building. Co-operation;
- Increased investments. Public and private sector investments. Increased viability of investments. Donor involvement. Commercialisation of public infrastructure;
- Improved technologies (and their transfer). Public involvement, participation, education/awareness/ information.

Environmental management in Sri Lanka has already gone a long way towards becoming a functional sector, and a number of the identified priority issues indicate that key players are keen to have the final steps set. Consistency in sub-sectoral policies and legislation, and collaboration between public institutions are still far from adequate, but the intention to improve this is obviously present. This, as such, makes continued financial and technical assistance to the natural resources management sector of Sri Lanka worthwhile, in order to bring the final phase of the sectoral approach, i.e. financial programme support, soon within reach.

In Table 24 (components of) pipeline projects are compared with the priority issues, in order to determine their immediate relevance in addressing major natural resource management constraints. If project objectives and approaches are indeed addressing a number of priority issues, they can be considered justified. This will be the case for most of the projects in the pipeline, since the environmental sector in Sri Lanka is well aware of its priorities and requirements. In Table 24, the projects are also compared with the above main Dutch policy elements, in order to determine whether Dutch development co-operation should be advised to play a financial role.

3.4.2 Conformity of pipeline projects

A review of “donor assistance to environmental areas in Sri Lanka” was prepared by the WB in January 1999. From this document the Dutch, WB, ADB and UNDP pipeline projects were extracted; all others are not relevant for Dutch (co-)financing. This information was supplemented with details on project components, extracted from a set of project documents available with the RNE. The present status of the identified relevant projects is given in Table 24.

For the Netherlands Government, “environment” is already a priority area for assistance. In Sri Lanka recent focus was on wetland management, participatory forest management, and institutional strengthening of CEA. At present the main activity is an Integrated Resources Management Programme (1998-2002), intending to develop and test a model for biodiversity conservation-cum-economic development. Discussions on continuation of (or follow-up to) IRMP after 2002 have not yet started. The largest bilateral environmental project in the pipeline is the “Coastal Resources Management Project” (CRMP) by ADB, followed by a recent request from ERD to finance the

parallel component to the Forestry Development Project, on “biodiversity assessment and monitoring in conservation forests”.

Although the WB has a substantial project portfolio, supporting environmental conservation, their involvement in this sector in Sri Lanka is rather limited. At present, the EAIP is midway, focusing on institutional strengthening of M/F&E and CEA and on small-scale community-driven land conservation activities. Furthermore, the “Conservation and Sustainable Use of Medicinal Plants Project” is underway with GEF assistance, as well as a number of projects to control pollution, especially in Colombo. During the coming years the WB intends to support the ADB-initiated Protected Area Management and Wildlife Conservation Project (PAMWCP) through the Global Environmental Facility administrated by WB. WB will continue to focus on pollution abatement issues, and on community water supply and sanitation. There are provisional plans to focus on strengthening of sub-national levels of governance in natural resource and environmental management, and on enhancing environmental components of other projects, but none of these activities have so far materialised any further. WB will also assist Sri Lanka in power sector reform.

ADB applies the concept of “ecologically sensitive areas” in its lending policy. The main objective here is equitable distribution of costs and benefits of both conservation and exploitation, leading towards long-term sustainable use. At the moment, exploiting natural resources yields greatest profit for governments, traders, and industry, but not for the local people, who pay the environmental costs of overexploitation. Those who benefit should pay (more of) the costs of ensuring that resources are used sustainably. To meet this objective, ADB promotes various means, including education, participation, and planning and management of natural resources. In Sri Lanka, ADB assistance has been concentrated so far on forestry (including upper watershed management) and fisheries, on institutional strengthening of the water resources planning sector, and on water supply and sanitation. ADB expects to be a lead source of assistance in natural resources management in the coming years, with lending amounting to some US\$ 100 million. Focus will be on protected areas and wildlife, forest resources, coastal resources, and water resources.

In Table 24, the critical priority issues are indicated, leading towards co-financing recommendations.

donor	project title and relevant information	priority issues covered *)	suitable for co-financing
ADB	<p>FORESTRY RESOURCE MANAGEMENT US\$ 40 mio. Start end of 2000. Components:</p> <ul style="list-style-type: none"> • Participatory planning, extension and awareness. Sub-components: <ul style="list-style-type: none"> • Survey, delineation, demarcation and mapping. Data base management, boundary surveys and demarcation • Integrated management planning. Classification, resource inventories, zoning, land resource planning, operational plans • Extension and awareness. FD media department, national campaigns, extension, establishment of networks, school programmes, demo plots, co-operation with NGOs • Sustainable forest development and management. Sub-components: <ul style="list-style-type: none"> • Participatory forest development and management. Participatory planning, improved land use, increased rural income, land allocation (long lease terms), plantation establishment, improved plantation management, demonstration, training • Participatory rehabilitation and management of protected forests. Conservation forestry, buffer zone development, public awareness, improved tenure security, soil conservation, assistance to smallholders, community capacity building, enrichment planting • Production forest management. Commercial forestry, improved state plantations output, pilot leaseholds • Capacity building. Policy/institutional reforms, training, FD management, GIS, in-country courses for FD staff and private sector, workshops at community level, overseas training, facilities • Parallel component (US\$ 260,000 over 5 years): Biodiversity assessment and monitoring in conservation forests. establishment of a participatory system for assessing harvesting impacts, development of monitoring protocols, MIS 	<ul style="list-style-type: none"> • <u>21-10;22-03; 22-08</u> • <u>21-02;21-04</u> • <u>21-02;21-04; 21-05; 22-09</u> • <u>21-02;21-04; 21-05;21-09; 22-09;22-20; 22-27</u> • <u>21-02;21-04; 21-05;21-08; 21-09;22-02; 22-03;22-09; 22-13;22-20; 22-27</u> • <u>21-04;22-20; 22-27</u> • <u>21-02;21-04; 21-06;21-10; 21-11</u> • <u>21-02;21-03; 21-04;21-09; 21-10;22-08</u> 	<ul style="list-style-type: none"> • no • no • yes, will improve environm. conditions • yes, will improve environm. conditions • yes; build on IRDP Ratnapura experience; environm'l focal point • no • yes, but not for facilities. Better governance • yes, environm'l focal point; will improve environm. conditions

ADB	<p>WATER RESOURCES MANAGEMENT (WESTERN RIVER BASINS DEVELOPMENT) US\$ 35 mio. Start end of 2000. Components:</p> <ul style="list-style-type: none"> • institutional development. Sub-components: <ul style="list-style-type: none"> • establishment of NWRA • improvement of data bases. Surface water and groundwater quantity and quality • capacity building in conflict resolution. Water allocation in selected basins, starting with the Menik Ganga (SE) and the Deduia Oya • infrastructure for water resources management. Sub-components: <ul style="list-style-type: none"> • Kelani conservation barrage • low flow weirs for measurement of river flows 	<ul style="list-style-type: none"> • <u>21-02;21-03;22-04</u> • <u>21-02;21-10;22-07;22-19;22-26</u> • <u>21-01;21-02;21-03;21-04;21-06;22-07;22-19;22-25;22-26</u> • 22-07 • 21-10;22-07;22-19 	<ul style="list-style-type: none"> • yes, environm'l focal point • yes, environm'l focal point, • yes, improved governance • no • no
ADB	<p>PROTECTED AREA MANAGEMENT and WILDLIFE CONSERVATION US\$ 10 mio. Start end of 2000. Preliminary components:</p> <ul style="list-style-type: none"> • institutional strengthening of DWLC. GIS, MIS, training, institutional co-ordination, improved legislation • management of 7 field sites. Including zoning, prevention of overexploitation, service concessions to private sector • setting up of an endowment fund (GEF funds). To assist community-based activities, benefit-sharing, prevention of missed income opportunities 	<ul style="list-style-type: none"> • <u>21-01;21-02;21-03;21-05;21-06;21-12;22-05;22-08;22-11</u> • <u>21-02;21-04;21-08;22-03;22-11</u> • <u>21-02;21-04;21-07;21-08;21-09;22-08</u> 	<ul style="list-style-type: none"> • yes, environm'l focal point; improved governance • yes, use of IRMP/WCP experience; environm'l focal point • yes, use of IRMP/WCP experience, will improve environm. conditions
ADB	<p>CAPACITY BUILDING for NATURAL RESOURCES MANAGEMENT US\$? Fact finding/preparatory TA ongoing</p>	<ul style="list-style-type: none"> • <u>21-01;21-02;21-03;21-06;21-07;21-08;21-09;21-12;22-08</u> 	<ul style="list-style-type: none"> • yes, improved governance

ADB	COASTAL RESOURCES MANAGEMENT US\$ 80 mio. Start mid 2000. Components: <ul style="list-style-type: none"> • <i>coastline stabilisation. Engineering interventions</i> • <i>coastal environment and resource management. Co-ordination with communities, awareness building, SAM preparation; conservation management interventions</i> • <i>fisheries resources management and quality improvement. Development of systems and infrastructure to prevent overexploitation and to improve product quality, monitoring, special studies</i> • <i>institutional strengthening. M/FAR and community organisations, training, data management, special studies</i> 	<ul style="list-style-type: none"> • <i>22-27</i> • <i><u>21-01;21-02;</u> <u>21-04;21-05;</u> <u>21-08;22-11</u></i> • <i><u>21-10;22-03;</u> <u>22-10;22-15</u></i> • <i><u>21-01;21-02;</u> <u>21-03;21-04;</u> <u>22-08</u></i> 	<ul style="list-style-type: none"> • <i>no</i> • <i>yes, use of IRMP/WCP experience; will improve environm. conditions</i> • <i>no</i> • <i>yes, improved governance</i>
ADB	RESOURCES MANAGEMENT EAST COAST US\$? Fact finding completed, preparation expected	<ul style="list-style-type: none"> • <i><u>21-04;21-07;</u> <u>22-08</u></i> 	<ul style="list-style-type: none"> • <i>yes, dependent on final design</i>
ADB	COST RECOVERY MECHANISMS FOR COASTAL ZONE PROTECTION US\$? Fact finding planned	<ul style="list-style-type: none"> • <i><u>21-02;21-04;</u> <u>21-08;22-05;</u> <u>22-08;22-15</u></i> 	<ul style="list-style-type: none"> • <i>yes, dependent on final design</i>
ADB	MODERNISATION LAND ADMINISTRATION Planned	<ul style="list-style-type: none"> • <i><u>21-01;21-03;</u> <u>21-10;22-01;</u> <u>22-13;22-27</u></i> 	<ul style="list-style-type: none"> • <i>yes, dependent on final design</i>
ADB	SOUTH ASIA COASTAL and MARINE RESOURCES MANAGEMENT & POVERTY ALLEVIATION (regional) US\$? Fact finding proceeding	<ul style="list-style-type: none"> • <i><u>21-02;21-03;</u> <u>21-04;21-06</u></i> • <i><u>22-08;22-10;</u> <u>22-15</u></i> 	<ul style="list-style-type: none"> • <i>yes, dependent on final design; regional cooperation</i>
WB	MAHAWELI RESTRUCTURING AND REHABILITATION US\$ 57 mio. Partly started. Components: <ul style="list-style-type: none"> • <i>commercialisation programme</i> • <i>river basin management component (erosion control, water/groundwater management)</i> • <i>rehabilitation component</i> 	<ul style="list-style-type: none"> • <i>none</i> • <i><u>21-04;22-01;</u> <u>22-02;22-19</u></i> • <i>none</i> 	<ul style="list-style-type: none"> • <i>no</i> • <i>yes; environm'l focal point</i> • <i>no</i>

WB	COMMUNITY WATER SUPPLY AND SANITATION <i>Planned. Mainly technical interventions and capacity building in communities</i>	• <u>21-04</u> ;21-05; 22-07	• no
WB	LAND TITLING <i>US\$ 15 mio. Planned</i>	• <u>21-01</u> ;21-05; <u>21-07</u> ;21-09; 21-10; <u>22-01</u> ; <u>22-13</u> ;22-27	• yes, will improve environm. conditions
WB	RURAL ENERGY <i>Planned; cleaner fuel in rural areas</i>	• <u>21-04</u> ;21-05; 22-16	• yes, dependent on design; environm'l focal point
EU	GROUNDWATER MASTER PLAN <i>Euro 8 mio. Planned</i>	• 21-10;22-07; <u>22-19</u> ;22-25; 22-26	• support advised; environm'l focal point
UNDP	SUSTAINABLE LAND RESOURCES POLICY DEVELOPMENT <i>Planned</i>	• <u>21-01</u> ;21-02; <u>21-03</u> ;21-06; <u>22-01</u> ;22-02; 22-25;22-27	• yes, if required; support advised
UNDP	CONSERVATION OF BIODIVERSITY IN SELECTED COASTAL ECOSYSTEMS <i>Planned. Rekawa Ussangodan and Kalametiya participatory management</i>	• <u>21-04</u> ;21-08	• support advised; use of WCP/IRMP experience
UNDP /GEF	CONSERVATION OF THE UNIQUE BIODIVERSITY IN THREATENED RAIN FORESTS IN THE SW OF SRI LANKA <i>Planned. Will include participatory management and buffer zone development</i>	• <u>21-02</u> ;21-03; <u>21-04</u> ;22-03; <u>22-08</u> ;22-09	• support advised; environm'l focal point
FAO	CONSERVATION AND MANAGEMENT OF SELECTED RAIN FORESTS IN SRI LANKA <i>Planned</i>	• <u>21-01</u> ;21-02; <u>21-04</u> ;21-10; <u>22-08</u> ;22-11	• yes; environm'l focal point
*) The figures indicate the issues in Tables 21 and 22; red figure issues were highly rated in the workshop; underlined figure issues have substantial effect on the sector as a whole.			

Table 24 - Pipeline projects and their significance

4 RECOMMENDATIONS

4.1 General conditions

The present analysis of suitability of projects for financing is based upon the conformity between project objectives, Dutch policies, and priority issues in natural resources management. The analysis does *not comment on the quality of the project proposals themselves*. Further decisions on (co-) financing of projects will depend on:

- the quality of the proposed interventions (appropriate to meet project objectives);
- linkages with other and previously supported projects;
- priorities of government (ERD); and
- availability of funds.

4.2 Recommendations for co-financing

Provided that the conditions in section 4.1 are met, *co-financing will be justified and is recommended for the following pipeline projects or project components*, all expected to start in 2000:

- **ADB - Forestry Resources Management Project:** the Extension and Awareness sub-component of the Participatory Planning, Extension and Awareness Component, the Sustainable Forest Development and Management Component, but without the Production Forest Management sub-component, the Capacity Building Component, but without the regional infrastructure (offices), and the Parallel Component on Biodiversity Assessment and Monitoring in Conservation Forests. The selected (sub-) components address priority issues; the Sustainable Forest Development Component (in Ratnapura) might substantially build upon the Dutch IRDP and Master Planning experience.
- **ADB - Protected Area Management and Wildlife Conservation Project:** the Institutional Strengthening Component, the Site Management Component, and the Endowment Fund Component. The project addresses only priority issues, and will make use of the Dutch WCP/IRMP experience. Also for this project a parallel component on Biodiversity Assessment and Monitoring is planned, for which ADB has already identified IUCN.
- **ADB - Coastal Resources Management Project:** the Coastal Environment and Resource Management Component, and the Institutional Strengthening Component, both with due regard to the conditions set by the Netherlands expert mission in February 2000. These two components address a number of priority issues, and build on Dutch experience in Muthurajawela/Negombo.
- **ADB - Water Resources Management Project** (previously Western River Basins Development). The Institutional Development Component, dealing with a number of priority issues and requiring typical Dutch expertise.
- **WB - Mahaweli Restructuring and Rehabilitation Project:** the River Basin Management Component (need for funding unclear as yet).

For projects somewhat deeper in the pipeline, *co-financing might be considered given the conformity of the general objectives of the projects with the sector priorities, but should be based upon further analysis of project documents*, once available. These include:

- **ADB - East Coast Resources Management Project;**
- **ADB - Capacity Building for Natural Resources Management Project;**
- **ADB - Cost Recovery Mechanisms for Coastal Zone Protection Project;**
- **ADB - Modernisation of Land Administration Project;**

- ADB (regional) - *South Asia Coastal and Marine Resources Management and Poverty Alleviation Project*;
- WB - *Land Titling Project*;
- WB - *Rural Energy Project*.

Finally, if required at all, **it is recommended to provide support to, or at least to seek co-ordination with, the following pipeline projects** of other international donors:

- EU - *Groundwater Master Plan*;
- UNDP - *Sustainable Land Resources Development Project*;
- UNDP - *Conservation of Biodiversity in Selected Coastal Ecosystems*;
- UNDP/GEF - *Conservation of the Unique Biodiversity in Threatened Rain Forests in the South West of Sri Lanka*.

4.3 Recommendations for bilateral actions

A number of smaller, rather technical issues are not covered by any of the above planned or recommended support arrangements. These issues, with modest priority, but still of importance for the sector, are:

- promotion of the development of alternative sources of energy.
Introduction of simple methods for production of alternative energy will have to start with demonstrations. WB considers funding of a Rural Energy Project, aiming at introduction of cleaner fuel in rural areas. Shell (Sri Lanka) indicated interest in development of solar energy, whereas simple methods for biogas production and for use of wind energy are well-known. **It is recommended to bring interested parties together in a workshop, with the purpose to found a "national" demonstration plot.** CEB, CEA and/or IUCN could be requested and supported for organisation of the workshop (e.g. with assistance from IRMP), and to make space available for a demo plot.
- promotion and stimulation of rain water harvesting.
The Rain Water Harvesting Forum has already done good work in Sri Lanka, partly with support from the RNE. **It is recommended to include a demonstration of the various rainwater harvesting systems at a demonstration plot**, e.g. in connection with a protected area visitor centre; combination with a demo plot for alternative energy production could be considered.
- action plan to control invasive flora and fauna.
A number of exotic plant species are threatening the functioning of ecosystems, habitats, and protected areas by competing with native flora, whereas they remain free from stress from natural enemies. For a number of these species suitable biological control mechanisms are developed (*Opuntia* spp. (prickly pear); *Eichhornia crassipes* (water hyacinth), *Pistia stratiotes* (water lettuce)), or under development (*Lantana camara*, *Ulex* spp.). For the invasive tree species *Anona glabra* control might be achieved through identification of opportunities of economic use of the species. **It is recommended to consider bilateral financing of introduction of one of these programmes, in co-operation with M/F&E.** M/F&E and IUCN have already prepared a full-fledged project proposal, fully in line with the recommendations of the Convention on Biological Diversity (ratified by Sri Lanka), and proceeding from the "national list of threatened flora and fauna", issued by IUCN in 1999.
- conservation and management of selected rain forests in Sri Lanka.
This project covers a number of priority issues, and is in agreement with one of the Dutch international focal points (conserving the worlds' biodiversity). The project was to be executed with assistance from FAO. Execution, however, did not yet materialise; ERD has indicated its wish to assess the priority of this project in relation to activities in the ADB pipeline.

4.4 Recommendations for other activities

A number of high priority issues or issues of wide sectoral importance are not addressed by the present set of pipeline projects of the international financing agencies. These are:

- establishment of facilities/sites for sanitary landfill and hazardous waste treatment.
It is recommended to bring this priority issue to the attention of the international financing organisations, or to actively seek an agreement between the Sri Lankan government and relevant Dutch companies, using the opportunities of Dutch ORET/MILIEV financing.
- reformulation and simplification of legislation with relevance to natural resources management.
This will only marginally be addressed by some of the pipeline projects, and only for some of the sub-sectors. However, the long list of acts with relevance to natural resources management (see *Annex F*) and the resulting long periods needed for legal actions are a severe threat to effective management of resources. *It is recommended to bring this priority issue to the attention of the international financing organisations, especially to ADB, with the request to include consideration of this issue in the preparation of the "capacity building for natural resources management project".*
- establishment of a centralised training system for aspects of resources management.
It is recommended to bring this priority issue to the attention of the international financing organisations, especially to ADB, with the request to include consideration of this issue in the preparation of the "capacity building for natural resources management project".
- streamlining of EIA procedures.
It is recommended to consider establishment of a formal relation between the Dutch EIA Committee ("MER-Commissie) and the CEA.
- introduction of a strict pesticide use regulation, based upon integrated pest management.
It is recommended to bring this priority issue to the attention of FAO/UNDP.
- preparation of a country-wide policy and action plan for air quality management.
It is recommended to bring this priority issue to the attention of the international financing organisations; a twinning arrangement could be suggested with the Netherlands Institute for Environmental Management in Zeist, possible with MILIEV support.
- promotion of environmental self-audit systems for industries.
It is recommended to bring this issue to the attention of the EU, which supported development and introduction of a very efficient and highly appreciated system in Europe.

These recommendations could be attended to by the Environmental sector Specialist, expected to be assigned to the RNE from mid-2000.

Since ERD requested RNE to closely co-operate with the ADB as the lead donor in the field of natural resources management, it is highly recommended that the Sector Specialist supports the development and establishing of a *mechanism for co-ordination between donors* in the natural resources management sector, with the government "in the driving seat"; this mechanism might further develop into a much-needed *national co-ordination committee for natural resources management*.

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ANNEXES

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ANNEX A

Terms of Reference

ANNEX A

TERMS of REFERENCE for ENVIRONMENTAL SECTOR STUDY – SRI LANKA

A. Objectives

At the request of the Sri Lankan authorities the environmental sector has been identified as a priority area for long-term cooperation with The Netherlands, and in order to benefit from specific Dutch expertise a strategic partnership with the Asian Development Bank (ADB) has been suggested by the authorities, although cooperation with the World Bank is certainly not excluded. In the area of natural resources management the ADB has agreed to be the lead-donor, and The Netherlands have been requested by the authorities to work together with the ADB in this field because of the proven track-record and long experience of the Dutch in Sri Lanka.

The proposed environment sector analysis will serve the Netherlands Embassy to establish whether support for the area of natural resources management offers sufficient scope for the realisation of Dutch policy in this area (accountability). Secondly, whether the selected sub-sectors and approach of the ADB as the lead-donor in this field in Sri Lanka sufficiently reflects local priorities and offers scope for a coherent and well co-ordinated contribution from The Netherlands.

The study will consist of two parts:

- I. A “quick scan” of the environmental sector: a description and analysis of the present technical and institutional functioning. Emphasis will be on “natural resources management”, given urgency by the Government of Sri Lanka, but the situation in the “brown” part of the sector (waste, sewage and pollution management) will have to be taken into consideration as well. The scan will result in a selected list of areas in need of development support, prioritised in time.
- II. An in-depth analysis of the identified priority areas. The analysis will review the priority areas from the point of view of the Netherlands policies for the environmental sector, and indicate conditions for support. As far as natural resources management is concerned, opportunities for, as well as interest in, a participatory approach for sustainable economic development will be indicated. The analysis will also test the relevance of planned environmental support programmes of ADB and WB for both the identified priority areas and for compatibility to the Netherlands policy, with an emphasis on the ADB.

B. Terms of Reference for a “quick scan” of the sector

The first part of the “quick scan” consists of data collection. This part will be based upon existing information from various policy documents and sectoral reports, supplemented by interviews with resource persons from relevant Ministries, Authorities, Departments, and NGO's. It will result in a report, with the following contents:

1. Introduction
 - 1.1. Background and scope
 - 1.2. Methodology
2. Characterisation of the environment in Sri Lanka
 - 2.1. General trends and issues
 - 2.2. Land and land use
 - 2.3. Water resources and use
 - 2.4. Forests
 - 2.5. Wildlife
 - 2.6. Aquatic resources (incl. Marine)
 - 2.7. Biodiversity
3. Policies and Masterplanning
 - 3.1. Objectives and significance of National Environmental Action Plan, Biodiversity Action Plan, Coastal 2000, Forestry Master Plan, Water Master Plan
 - 3.2. International conventions
 - 3.3. Regional programmes
 - 3.4. Implementation capabilities
4. Institutional framework
5. Planning and programming: past, present and future activities (national and donor-supported)

The second part of the scan consists of an analysis of the collected data, resulting in the following chapters of the report:

6. Sector dynamics; an assessment of present and future requirements
7. SWOT analysis of policies
8. SWOT analysis of institutions
9. SWOT analysis of procedures (prioritising, programming, co-ordination)
10. Selection of priority issues for development support (short and long-term)

C. Terms of Reference for in-depth analysis of identified priority areas

Following the “quick scan” the same team of consultants will carry out the in-depth analysis. As indicated above, the in-depth analysis will focus on the following aspects:

11. Options and strategies for development support in the environmental sector, with first focus on sustainable management of natural resources and its institutional conditions
12. Identification of potential programmes
13. Relation of selected options/programmes to Netherlands policy priorities and sectoral strengths; setting of priorities
14. Relation of planned ADB and WB programmes to both identified needs and Netherlands priorities
15. Scope for and added value of Netherlands assistance (short-term and longer-term)

ANNEX B

Itinerary

ANNEX B

ITINERARY

(During the period 01-10 March 2000 IUCN started collection and processing of information in matrices prepared in, and sent from, the Netherlands)

TH 09/03	Travel Arnhem to Amsterdam. Departure flight TG 7681/921 from Amsterdam to Bangkok.
FR 10/03	Arrival Bangkok. Short visit to ESCAP library. Flight TG 307 to Colombo.
SA 11/03	Reading and preparatory activities. Briefing on progress by Mrs Yasaratne. Discussions with Mr Rolloos. Evening: participation in party at residence of Mr van Wijngaarden/Mrs van Krimpen.
SU 12/03	Reading information collected by IUCN. Meeting with Dr Samarakoon and Mr Hans Rolloos on IRMP matters and on logistics, with Mr Ton Jansen, and with Mr Peter Kuperus.
MO 13/03	First team meeting at IUCN. Explanation of processing systems and distribution of matrices. Time planning. Start processing data.
TU 14/03	Processing collected resource management data. Arrangements workshop. Logistics.
WE 15/03	Processing collected resource management data.
TH 16/03	Processing collected resource management data.
FR 17/03	IUCN progress meeting. Processing reference data.
SA 18/03	Processing reference data. Set up mission report.
SU 19/03	Start SWOP analysis.
MO 20/03	SWOP analysis. Progress discussions with Mrs Yasaratne and senior staff.
TU 21/03	Meeting with Mr Thosapala Hewage, Add. Secr. Planning M/F&E. SWOP analysis. Meeting with Mr Peter Kuperus, RNE.
WE 22/03	Meeting with Mr A.P.A. Gunasekara, Director DWLC, and his senior management team. Meeting with Mr Nissanka Perera, Director CCD. Meeting with Mr Lionel Jayasinghe, DG CEA. Visit to and discussions with staff of CEA and IRMP.
TH 23/03	SWOT analysis. Meeting with Mr Kondo, ADB.
FR 24/03	Stakeholder analysis.
SA 25/03	Visit to Muthurajawela with the Country Team from the Netherlands Ministry of Foreign Affairs. Presentation of sector study approach and progress. Finalisation of analyses.
SU 26/03	Reading and processing of literature data; preparation of longlist of issues.

MO 27/03 Reading and processing of literature data; adjustment of issues.

TU 28/03 Concentration and consolidation of issues. Preparation of interim report.

WE 29/03 Progress discussion with Mrs Yasaratne. Preparation of Workshop. Evening discussion with Mr Philip Dearden, Team leader PAMWCP appraisal mission.

TH 30/03 Preparation of hand-outs for workshop. Consensus-building workshop in Transasia.

FR 31/03 Processing of workshop outcomes. Preparation of prioritised lists of issues. Discussions with IUCN staff.

SA 01/04 Free day; trip to Galle.

SU 02/04 Work on conclusions of prioritisation process and on report. Telephone conversation with Mr Sumith Pilapitiya, WB.

MO 03/04 At the Embassy, extraction of information from project documents. Detailed report discussion with Mrs Yasaratne. Work on report. Telephone discussion with Mr Peter Logan, ADB.

TU 04/04 Work on report.

WE 05/04 Final consensus meeting with Mr Hewage, M/F&E. Work on report.

TH 06/04 Work on, and printing of draft Final Report.

FR 07/04 Printing of draft Final Report, and delivery to Mr Kuperus, RNE.

SA 08/04 Departure flight TG 308, Colombo to Bangkok, and flight TG 920/TG 7680, Bangkok to Amsterdam.

SU 09/04 Arrival Amsterdam; travel to Arnhem.

ANNEX C

Basic data matrices

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 1

RESOURCE: NATURAL FLORA

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Yes, National Herbarium, D/Agriculture	Yes, done with experts in the field	Yes, National Herbarium	More trained staff needed	? Previous revision flora of Ceylon was through ODA funding	Not known
National policy	Yes, BCAP'99; Forestry Master Plan'95; policy to cope with invasive plants being prepared by M/F&E	Yes	N/A	N/A	N/A	N/A
Internat. obligations	Yes, CBD'92,94	Yes	N/A	N/A	N/A	N/A
Legislation	F & F Prot. Ord. 1993 (being revised); Plant Prot. Act (No.39,'99)	Needs revision to address cross-cutting issues	Yes, DWLC and FD	Yes	Not known	Not known
Definitions, mandates	FD; DWLC; AD	Should be in one hand	No	Yes, but dispersed	N/A	N/A
Institutions	FD; DWLC; AD; National Herbarium & Botanical Gardens; HORDI; PGRC; Ayurvedic Dept.	No co-ordination; some management aspects neglected	No	Yes, but skill training might be required	Not known	Not known

Extension, awareness	Mainly by Universities & FD	Inadequate awareness	Yes	More trained staff needed		
Resource users	General public; Researchers, Industrial Entrepreneurs	N/A	Not to prevent over-exploitation	Yes	Yes	Yes
Management plans	For some communities only (eg. for mangroves - IUCN)	Not based on adequate ecological studies	Yes, IUCN and others	Yes	No	No
Procedures	For some communities only (eg. for mangroves - IUCN)	Not based on adequate ecological studies	No	No	?	?
Implementation	Only for mangroves, not for e.g. non-wood forest products	Not implemented properly	FD	Yes; not identified for activities. Training needed	No	No
Monitoring	University researchers, in specific areas	Too localized. Should be FD	No	No trained staff	No	No

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 2

RESOURCE: MEDICINAL PLANTS

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Separate data base available (March 2000)	High quality; considerable background and history well documented N/A	Developing through M/H&IM N/A	Yes, through WB/GEF project N/A	No, could be enlarged N/A	No N/A
National policy	Under development	N/A	N/A	N/A	N/A	N/A
Internat. obligations	Most international conventions regarding ecology and biodiversity	Specific obligations under development	Through M/H&IM	Yes	Yes	Yes
Legislation	Being developed	Being developed	N/A	N/A	N/A	N/A
Definitions, mandates	Being developed	N/A	N/A	N/A	N/A	N/A
Institutions	M/H&IM	Yes	Yes	Yes	?	?
Extension, awareness	Inadequate	Low quality, low intensity	No	No	No	No
Resource users	Commencing, but to be expanded	Developing; needs coordination through various agencies	No	No	No	No

Manage- ment plans	No; under development for some localized areas	Needs expansion	No	No	No	No
Procedures	no, but initial development for localized situations	Needs expansion	No	No	No	No
Implement- ation	Not developed yet	Needs expansion	No	No	No	No
Monitoring	Initial development through WB/GEF project for localized areas	Needs expansion	No	No	No	No

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 3

RESOURCE: FORESTRY - PRODUCTION FOREST

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Forestry inventory (1993), FD	Yes	Forest Management System, in FD	Yes; training required	No	No
National policy	National Forest Policy, approved by Cabinet in 1995. Policy/management of private forests/tree resources	Prepared following long deliberations with stakeholders	M/F&E, FD and other relevant stakeholders.	N/A	No	Yes
Internat. obligations	CBD, ratified in 1994; UN framework climate change (1992 Kyoto Prot.); RAMSAR convention (mangroves)	Conventions ratified, or party, through careful examination	Yes	No	No	No
Legislation	Forest Ordinance 16, 1907, 12 amendments; Tree Ordinance 1848; National Env. Act & Regulations 47, 1980.	Needs revision; draft amendments to Forest Ordin. reviewed by the M/F&E	No efficient/ sustainable management; no adequate organizational framework	Yes; external support for past amendments; training needed	Yes.	No
Definitions, mandates	Production forests fall under Class III (multiple use for.) and IV (plantations, agro-for.); Forest Dept.	No consensus; criteria being developed under ADB project	Yes	No, shortage	Not adequate	Yes

Institutions	Forest Department; State Timber Corporation; CBOs, Private Sector.	Proposed, no consensus yet. New plans aim at involvement private sector and CBOs in managing prod. forests	No, needs changes	FD: shortage of trained personnel at top/middle level. STC/ Priv. sector: no shortage	No	No
Extension, awareness	Forestry education and extension capacity available within FD	No; to be reoriented to joint management in future	No	No	No	No
Resource users	Villagers, Government, STC, Private organizations (per- mission to tap pines; leasing out of plantations planned.	Resource users identified. Details in Forestry Master Plan	More refined and needs oriented organizational framework required	No	No	No
Management plans	Only few available for large forests; more earmarked under ADB project. National Conservation Review lists 30 forest areas in the Wet Zone to be conserved	N/A	Not sufficient for intensive management; needs to be strengthened.	No: more human resources needed for intensified management	No; expected to be supplemented under the ADB project	No; expected to be supplemented under the ADB project
Procedures	Clear strategies identified in National Forest Policy and Forest Sector Master Plan	Basic procedures identified. Need to be verified	Yes; joint implement- ations FD/STC in large prod. forests.	No	No	No
Implementa- tion	Yes, by FD	According to plans but restricted to mahogany, teak, and pine plantations only	Yes, implementation officers attached to divisional offices	No	FD needs more; STC has adequate finances	No
Monitoring	Yes; but illicit felling continues	No	No	No	No	No

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 4

RESOURCE: FORESTRY - PROTECTION FOREST (forest reserves and proposed reserves)

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Environmental information mgmnt system (EIMS) in FD, following National Conservation Review (NCR); other data collection under NCR	Yes, accepted as methodical structure	No	No trained staff	No	No
National policy	National Forest Policy includes management of State Forest Resources; Biodiversity Action Plan.	Prepared after long deliberations with stakeholders/specialists	No	N/A	No	No
Internat. obligations	CBD, ratified in 1994; UN Conv. Climate Change-Kyoto Protocol (1992); RAMSAR (mangroves); World Heritage Convention on natural heritage (M&B reserves); CITES, Agenda 21	No, not addressed properly	No	No	No	No
Legislation	Fauna & Flora protection ordinance 2, 1937; Nat. Heritage and wilderness areas act; Forestry Ordin.	Existing legislation inadequate; needs further improvement	No	Yes, but training needed	No	No

Definitions, mandates	All Protection forests (National Parks, Sanctuaries, SNRs) under DWLC; all Production forests (Forest reserves, proposed forest reserves, other state for.) under FD. Mandates with FD and DWLC	No. Forestry Master Plan has defined categories of natural forest with different status of management	No, confusion	No	No	No
Institutions	FD, DWLC, NGOs, CBOs	Not structured	No	No	No	No
Extension, awareness	National Forestry Extension Program in place in FD. Education & awareness programs in both DWLC and FD	No. Many extension offices, but no real adequate extension work	Re-orientation and proper co-ordination required	More staff with higher motivation needed	Not adequate	No
Resource users	Communities in and around forests; tourists; researchers and study groups	Community management strategy necessary	No appropriate organizational framework in place	No	No	No
Management plans	Mgmt. Plans prepared for 12-conservation forests. Balance yet to be prepared	To be updated during implementation	No	No	No	No
Procedures	Inadequate; suitable procedures still to be defined	Existing basic procedures adhered to	Organizational framework DWLC/FD not procedurally organized to address issues	Yes, but not co-ordinated/harmonized	No	No
Implementation	FD, through its environmental management division. Implementation commenced in Knuckles/Singharaja forests	Yes	No	Yes	Limited	No
Monitoring	Is done, but not in a structured manner	No	Existing; not structured for objective monitoring	New cadres recruited, need training	No, funding required	No

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 5

RESOURCE: FORESTRY - MANGROVES

	Is it done? Is it clear what has to be done?	If done, is there consensus on quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	No, only fractional	Needs centralization and updating	No	Yes	?	?
National policy	Forestry Sector Masterplan (1996); Coastal Zone Management Plan (1997); Biodiversity Action Plan (1999)	Yes; all developed through a participatory process	Yes; M/F&E and FD	Yes; several organisations are involved	N/A	N/A
Internat. obligations	CBD (1992); Ramsar Convention (1971)	N/A	In place	Training required	?	?
Legislation	Overlapping legislation under several Ordinances and Acts, causes some confusion	Yes, for Forest Ordinance and Coast Conservation Act	Overlapping legislation results in contradicting mandates	Not enough trained staff	N/A	N/A
Definitions, mandates	FD responsible for mangroves in state lands; CCD has jurisdiction over those within the coastal zone; a National Mangrove Committee under NSF co-ordinates research and management	Overlapping mandates create ambiguity and mangroves on privately owned lands are not under jurisdiction of any state organisation	No - needs clarification in terms of responsibility	Inadequate staff in the state organisations to manage mangroves effectively	Necessity for more resources specifically dedicated to mangroves	?
Institutions	FD, CCD, CEA, SLLRDC, M/FAR	N/A	Yes - but mandates are contradictory	Shortage of trained staff	No special funds for mangroves	Not specifically for mangroves

Extension, awareness	At site specific level by certain NGO's and by FD	Not clear	No - does not cover all mangrove areas	Not adequate	Not adequate	Not adequate
Resource users	Communities adjacent to mangrove areas, educational/research organisations	N/A	No organisational framework for extension and awareness	N/A	N/A	N/A
Management plans	For 10 Selected Mangrove Sites in NW (1996), Conservation Management Plan for Mangrove Habitats South of Colombo (Draft), Forestry Sector Masterplan	Prepared through a participatory approach and consensus building workshops	Yes - in government and non-governmental organisations involved	Yes	Yes	N/A
Procedures	Procedures according to regulations applicable to the institutions involved	Yes - but can be more efficient and effective	Yes - as multiple organisations are involved	Yes-but not adequately trained for mangroves	?	?
Implementation	Implementation of some management plans in progress	Not assessed	Yes - the framework is in place	Yes-but not adequately trained for mangroves	No - not specifically set apart for mangroves	?
Monitoring	Some monitoring done by FD and CCD within areas under their control	No	The organisational framework is adequate	No - lack of training	Monitoring not considered a priority	?

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 6

RESOURCE: FORESTRY - COMMUNITY FOREST (privately owned or managed)

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	No	N/A	Yes	N/A	N/A	N/A
National policy	FD allocates blocks of land and supplies, to be managed by individuals, or leases out blocks of forest for 25 years ("farmer's wood lots"). Community forests for "non-wood forest products" managed by District Secretaries/ Grama Nidhari's	Not discussed	Yes	N/A	N/A	N/A
Internat. obligations	None	-	-	-	-	-
Legislation	Used opportunities allowed under existing laws	No, overexploitation common	No	-	-	-
Definitions, mandates	Not clear	-	-	-	-	-
Institutions	Mainly FD	-	-	-	-	-
Extension, awareness	Missing	-	No	No	No	No

Resource users	Consider themselves owners, and are not interested in more involvement FD	No co-ordination	No	Yes	Yes	Yes
Management plans	None existing	-	-	-	-	-
Procedures	Only lease procedures	Exploitation arrangements needed	-	-	-	-
Implementation	Various social forestry programmes by communities, mostly based upon traditional knowledge and on trial-and-error	Not sustainable; hardly modern methods used	No	-	-	-
Monitoring	None	Urgently required	No	Yea	No	No

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 7

RESOURCE: NATURAL FAUNA, TERRESTRIAL VERTEBRATES

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Yes, data at DWLC, IUCN, NGOs, Universities	Yes, but should be centralized. For birds centralized at Ceylon Bird Club (annual census)	Yes, but no co-ordination mechanism	Yes	?	?
National policy	Yes, BCAP'99; NEAP; Revised WL Policy (99/00).	Yes, participatory process. No policy on privatization, cost recovery	Yes, but no co-ordination mechanism	N/A	N/A	N/A
Internat. obligations	CBD'92/94; CITES; BONN; Ramsar'71	Yes	No; DWLC expected to take the lead	N/A	N/A	N/A
Legislation	Flora & Fauna Prot. Ord. (Amm.'93)	Needs to be revised	Yes	Yes	?	?
Definitions, mandates	DWLC - responsible for conservation	Yes, but has cross-cutting problems with other Departments	No co-ordination	Yes, but training required	Expected through ADB/GEF	Expected through ADB/GEF
Institutions	DWLC; many activities by others (CEA, NGOs)	Needs restructuring to improve efficiency	No co-ordination	Yes, but training required	Expected through ADB/GEF	No

Extension, awareness	Yes, by various actors and on restricted animal groups	Not enough awareness creation, and sometimes inadequate quality	Yes, but no co-ordination	Yes, but training required	Expected through ADB/GEF	No
Resource users	Tourists; Local communities; Researchers	No sustainability	No co-ordination	N/A	N/A	N/A
Management plans	Specific mgmt plan for Elephant (DWLC) and for localized reptile groups. More in preparation	More awareness- than management- directed	No co-ordination	Yes, but training required	No	?
Procedures	Some in preparation, but none for licenses (cost recovery). Fining system in place	Needs improvement and expansion	No co-ordination	Yes	Yes	?
Implementation	DWLC, for elephant only	Far inadequate, even for elephant	Yes, DWLC with field staff	Yes	No	No
Monitoring	DWLC	Can only be adequate after practical management plans have been developed	Yes, DWLC with field staff	Yes, but training required	?	?

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 8

RESOURCE: NATURAL FAUNA, TERRESTRIAL INVERTEBRATES

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	No, data have to be gathered on many groups	N/A	Yes, through NGOs, but requires co-ordination	Yes, but taxonomic skills to be upgraded	Not known	Not known
National policy	Yes, BCAP'99	Yes, through participatory process	N/A	N/A	N/A	N/A
Internat. obligations	Yes, CBD'92,94; CITES	Yes	No, no initiatives and no co-ordination	N/A	N/A	N/A
Legislation	F & F Protection Ordinance	Needs revision and consensus on cross-cutting issues	No, no initiatives and no co-ordination	Yes	Not known	Not known
Definitions, mandates	DWLC; D/Agriculture	DWLC and D/A have contradictory mandates	No co-ordinative discussions started	Yes, but need to be trained	Not known	Not known
Institutions	DWLC; D/Agriculture	No specific activities	No co-ordination	Yes	No	No
Extension, awareness	Inadequate or absent	Should be prepared or upgraded	Yes, at DWLC and elsewhere; no co-ordination	Yes, but need to be trained	Not known	Not known

Resource users	Researchers; Farmers; Companies (silk, honey, pollination of crops)	N/A	N/A	N/A	N/A	N/A
Management plans	No (only for agricultural pests)	For pests: yes	No co-ordination	Yes	Not known	Not known
Procedures	Yes (only for agricultural pests)	Yes, only for agricultural pests	Yes	Yes	Not known	Not known
Implementation	Only for pest control	Yes, only for pest control	Yes	Yes	Not known	Not known
Monitoring	Only pests, no other invertebrates	Pests only; for others no management plans	Yes	Yes (needs to be trained)	Not known	Not known

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 9

RESOURCE: NATURAL FAUNA, AQUATIC (freshwater)

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Vertebrates - Yes; Invertebrates - very limited	Vertebrates - Yes; Invertebrates - for groups documented	Yes for vertebrates	Yes	Not known	Not known
National policy	BCAP'99	Yes	N/A	N/A	N/A	N/A
Internat. obligations	CBD'92, 94	N/A	N/A	N/A	N/A	N/A
Legislation	F & F Protection Ordinance; NARDA Act; Fish & Aquatic Resources Act	Needs revision to address cross-cutting issues	Yes	Yes	Not known	Not known
Definitions, mandates	DWLC, NARA, M/FAR, fishermen groups	More co-operation required	Yes	Trained staff needed for invert's	Not known	Not known
Institutions	DWLC, NARA, M/FAR, NGOs	Yes	Reasonable good co-operation	Trained staff needed for invert's	Not known	Not known
Extension, awareness	Yes, only fish of commercial importance	Inadequate	Yes	Needs more trained staff	Not known	Not known

Resource users	Fishermen, Researchers, Ornamental Fish breeders	N/A	Fishermen organize themselves increasingly	N/A	N/A	N/A
Management plans	For commercial fisheries only	Through participatory process	Low co-operation with other institutions	Yes	Yes	Yes
Procedures	Licence systems; enforcement by fishermen; culture systems for ornamental fish	Here and there good quality	Only fisheries directed	Yes	Yes	Yes
Implementation	In a few places	Inadequate; still overexploitation of native fish species for aquarium trade	More guidance required	Yes	Yes	Yes
Monitoring	In a few places; by fishermen groups	Yes	More guidance required	Yes	No	No

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 10

RESOURCE: PROTECTED AREAS

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Yes, with DWLC	Not sufficiently need-based; not enough in Wet Zone; not enough corridors	Yes	Yes	Yes	Yes
National policy	BCAP'99; Forestry Master Plan'95; Wildlife Policy being revised	Prepared through a participatory process	N/A	N/A	N/A	N/A
Internat. obligations	CBD - 92/94 ; Ramsar Conv. '71; WHC'72	Yes	Yes; responsibility with DWLC	N/A	N/A	N/A
Legislation	F & F Protection Ordinance; NHWAA	Needs revision to address legal loop holes	Yes	Yes	Yes	Yes
Definitions, mandates	DWLC; FD; Provincial Councils	Overlaps	No collaboration on cross-cutting issues	Yes	Not known	Not known
Institutions	DWLC; FD; partly CCD	DWLC - needs to be upgraded	No collaboration on cross-cutting issues	Training needed	Not known	Not known
Extension, awareness	Yes, by DWLC	No, inadequate extension	Yes	Yes	Not known	Not known

Resource users	Local communities; Visitors; Hoteliers; Researchers; Govt.	No: access problems; overexploitation	No partnerships, no co-ordination	Yes	Yes	Yes
Management plans	Prepared for some by DWLC, others being prepared; also plans prepared by FD, CEA	In general good quality	Sometimes indicated, often no participation local communities; conflict resolution not well addressed	Yes	GEF; ADB	Yes
Procedures	Indicated in legislation and most management plans	Not always clear; interpretation flexible	No co-operation resource users	Yes	GEF; ADB	Not known
Implementation	DWLC; FD; CEA (research); DWLC plans not implemented	In early stage. Enforcement of rules low; no cost recovery. Too many small pockets, resulting in inefficient use of resources	No co-operation resource users	Yes	GEF/ADB; need to recover costs	No
Monitoring	DWLC; FD	No - Inadequate monitoring	No co-ordination; No co-operation with resource users	Yes	Yes	Yes

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 11

RESOURCE: ECO-TOURISM

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Still in initial stage, data to be gathered and centralized	Quality data unclear	CTB & M/AT; no co-ordination with DWLC	Yes	Not known	Not known
National policy	TMP (for tourism in general, but eco-tourism has not been highlighted adequately). TMP ('92-'01) is being revised, based upon positive contribution of eco-tourism to budget	Ecotourism needs more attention, incl. role of conservation authorities	CTB & M/AT; no co-ordination with DWLC	Yes	Funds from revenue available to CTB for pro-motion and marketing	Yes, the Hoteliers would also contribute
Internat. obligations	None as such, but various conventions (incl. CBD) contain relevant chapters	N/A	N/A	N/A	N/A	N/A
Legislation	CTB Act No. 10 of 1966	To be revised to address negative impacts and indicate role of DWLC/FD	Yes	Yes	Yes	Yes
Definitions, mandates	CTB, M/AT; not clear for management of resources or visitor centres	Marketing/Promotion of good quality; no sustainability issues	No	Yes	Yes	Yes
Institutions	CTB, M/AT	Yes	No co-ordination with conservation authorities	Yes	Yes, Govt. funds	Yes

Extension, awareness	By CTB and some hotels	Inadequate emphasis on impacts and risks	Need to be co-ordinated with DWLC	Yes	Yes, Govt. funds	Yes
Resource users	Tourists; Hoteliers; Govt; Local communities; Shopkeepers; Entrepreneurs	Often not quality-directed, only for short gains	No adequate co-ordination with conservation authorities	Yes	Yes	Yes
Management plans	No site-specific eco-tourism management plans, except for Muthurajawela	Urgently needed to improve sustainability	Not yet existing	Yes, but training required	?	?
Procedures	With CTB, but need more emphasis on eco-tourism and on cost recovery	Development urgent	Co-operation needed with conservation authorities	Yes	Yes	?
Implementation	CTB, M/AT, CEA (model development), DWLC	No; hardly directed towards conservation or even information	None	Yes	Not sufficient	Not sufficient
Monitoring	CTB, M/AT	Inadequate from environmental view: directed towards visitors only	None	Yes	Yes	Yes

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 12

RESOURCE: COASTAL AND MARINE RESOURCES - CORAL REEFS

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	At NARA, Coral Reef Unit	NARA has the necessary expertise	At NARA	No special staff	Needed for expansion	No
National policy	Coastal Zone Management Plan (1997) and the Biodiversity Action Plan (1999)	Developed through a participatory process	Yes - at relevant Ministries and government institutions	Yes	N/A	N/A
Internat. obligations	CBD, UNCLOS, Framework convention on Climate Change	Yes	Yes	Yes	Not known	Not known
Legislation	Fisheries and Aquatic Resources Act 1996, Coast Conservation Act, F&F Protection Ordinance, National Aquatic Resources Research and Development Act	Yes, no conflicting chapters	Yes	Yes	N/A	N/A
Definitions, mandates	Available, and divided over a number of agencies	There are a few overlaps	No co-ordinated actions, no regular exchange of knowledge	Yes	N/A	N/A
Institutions	CCD for reefs in the coastal zone; M/FAR for offshore reefs; DWLC for reefs within Marine Protected Areas; NARA for research	Overlapping institutional mandates give rise to confusion and lack of consensus	No co-ordination mechanism	Yes	Not sufficient trained personnel	Shortage in equipment for coral reef work

Extension, awareness	Some awareness activities by NARA, CCD and some NGOs	Not assessed	None of the organisations is specifically geared for this	Not enough trained staff	No	No
Resource users	Coral miners, ornamental fish collectors and exporters, spear fishermen, tourists and recreational divers	No sustainable use systems	Only tourism activities are under a proper organisational framework	Yes	Yes	Yes
Management plans	Special Area Management Plans for Hikkaduwa and Rekawa by CCD	Need to be expanded to cover more areas	Prepared through a participatory process	Insufficient trained staff	Not adequate to ensure updating	Yes
Procedures	Procedures followed according to mandates of the organisations responsible	Would be more effective if procedures were more practical in field	The framework is adequate, but co-ordination is lacking	Yes	Inefficient due to lack of resources	Inefficient due to lack of resources
Implementation	Management plans and legal statutes implemented by the relevant organisations	Implementation and law enforcement are weak	The organisational framework is in place, but lacks co-ordination	Lack of personnel	Insufficient resources	Insufficient for detection of offences
Monitoring	Some monitoring is carried out by the relevant authorities, specially NARA and CCD	Assessments have not been done	Institutional framework for monitoring is weak	No trained personnel	Not enough resources	No

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 13

RESOURCE: COASTAL AND MARINE RESOURCES - FISHERIES

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	No, but urgently required as a basis for management	N/A	N/A	Yes	No	No
National policy	BCAP; no fisheries policy	Developed through a participatory process	Yes - at M/FAR	Yes	YES	Yes
Internat. obligations	CBD, UNCLOS, CITES, MARPOL	Yes	Yes	Yes	Yes	Yes
Legislation	Fisheries and Aquatic Resources Act of 1996, F&F Protection Ordinance, National Aquatic Resources Research and Development Act	Yes	Yes - in the Ministry of Fisheries, Dept. of Fisheries and NARA	Yes	N/A	N/A
Definitions, mandates	M/FAR mandated to implement fisheries act and regulations. NARA mandated to do research in fisheries sector. DWLC mandate to prevent protected species from being taken	Yes	Yes, but co-ordination unclear	Yes	N/A	N/A

Institutions	M/FAR, Department of Fisheries, NARA, and DWLC	Yes	Yes, no clear-cut co-ordination	Yes	No	No
Extension, awareness	Some awareness activities by M/FAR and NARA	Not been assessed	Yes	Yes	Not known	Not known
Resource users	Fishermen	Overexploitation and illegal catches common	Fisheries co-operatives, but mainly focused on procurements, not on stock management	Yes	Yes	Yes
Management plans	General plans, with general rules and regulations available	Not based upon stock assessments	N/A	N/A	N/A	N/A
Procedures	Procedures only based upon act; followed according to the mandates of the organisations responsible	Enforcement low	No	Yes	No	No
Implementation	M/FAR responsible	Yes, as far as plans are applicable	Yes, within M/FAR; no co-ordination with other stakeholders	Yes	No	No
Monitoring	Some catch monitoring by NARA for research purposes	Not assessed	Yes	Yes	Not known	Not known

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 14

RESOURCE: COASTAL AND MARINE RESOURCES - MARINE PROTECTED AREAS

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Not existing	N/A	Yes, at DWLC	?	?	Yes
National policy	National Policy on Wildlife Conservation (1990); Biodiversity Conservation Action Plan (1999)	Yes - done through a participatory process	Not geared to management of MPAs	Shortage of personnel trained in marine work	N/A	N/A
Internat. obligations	UNCED; Rio Declaration 1992; Agenda 21; CBD; UNCLOS (1982 - 1994) and Ramsar Convention	Yes	Multiple organisations involved; no local coordination	Not trained specifically for this	Not known	Not known
Legislation	F&F Protection Ordinance 1993; Fisheries and Aquatic Resources Act (1996); Coast Conservation Act (1981)	Various loopholes, since existing legislation for terrestrial areas is being applied in the marine context	Not adequately geared for implementation in the marine sphere	No trained marine lawyers	Yes	Yes
Definitions, mandates	DWLC for marine sanctuaries/reserves declared under the F&F Ordinance; M/FAR for declared Fisheries Reserves; CCD for areas within the coastal zone and where SAM plans are developed	No - Mandates are overlapping and lead to confusion with regard to law enforcement and other responsibilities	Organisations in place, but co-operation and coordination not well addressed	Inadequate for mandated work	Not known	Inadequate for monitoring and enforcement activities

Institutions	DWLC and M/FAR, including NARA and CCD	Overlapping mandates and jurisdiction create some conflicts and contradictions	MPAs are a new concept; the organisational framework is not adequately geared for it	Not trained for the marine sector	Not known	No sufficient equipment/ facilities for marine areas
Extension, awareness	Not at all, except by hotels	Inadequate	Yes, DWLC	?	?	?
Resource users	Fishermen, ornamental fish collectors, tourists and recreational users	Some activities are illegal and endanger sustainability	No platforms or other co-ordination mechanisms	Yes	Yes	Yes
Management plans	Special Area Management Plan for Hikkaduwa; others not available	Limited in area of coverage and success is questionable	Framework for developing management plans in place, but inadequate	Not enough trained personnel	Some funding available	Yes
Procedures	Procedures described in the mandates of organisations involved	No - procedures are adaptations of those for terrestrial areas and sometimes difficult to apply in the marine field	No - not geared to the marine sector	Not enough trained personnel	No	Insufficient
Implementation	Implementation of management plan Hikkaduwa is in progress; enforcement of law within MPA's is inadequate	No consensus on the quality of work in progress	DWLC needs restructuring to meet needs of marine protected areas; no stakeholder involvement	Insufficient for the marine sector	Insufficient funds are set aside for MPAs	Insufficient equipment, transportation, etc.
Monitoring	Yes - only in SAM plan area at Hikkaduwa. Scientific biophysical monitoring on coral reefs done by NARA in the 2 MPAs	Scientific monitoring is of high quality; the quality of management monitoring is not known	No organizational co-operation; no stakeholder involvement	Lack of marine area monitoring personnel	No funds specifically set aside for this	Insufficient equipment, transportation, etc.

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 15

RESOURCE: COASTAL AND MARINE RESOURCES - COASTAL WETLANDS

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	No full data base; data base on selected coastal wetlands at CEA	CEA data of good quality	National Wetland Steering Ctee (NWSC), but not functioning	Yes	No	Yes
National policy	Coastal 2000; National Policy on Wildlife Conservation, and the BCAP (1999); none specifically for wetlands	All have been done through a participatory process	Draft for wetlands prepared by CEA in 1998	Yes	Yes	Yes
Internat. obligations	Ramsar Convention; CBD; Framework Convention on Climate Change; UNCLOS.	Yes	DWLC mandated to follow up and report	Yes	N/A	N/A
Legislation	F&F Protection Ordinance; Fisheries Ordinance; Coast Conservation Act. National wetland Act in draft	Draft Wetland Act gives adequate cover, since all disciplinary interests are served	National Wetland Steering Ctee (NWSC), but not functioning	Yes	N/A	N/A
Definitions, mandates	CCD has jurisdiction over wetland areas within the coastal zone; DWLC over wetlands within protected areas; SLLRDC over low-lying areas; FD over mangrove stands; M/FAR over fisheries	Mandates overlap and give rise to confusion	National Wetland Steering Ctee (NWSC), but not functioning. In Muthurajawela a special Management Committee, with all agencies and other stakeholders	Yes	N/A	N/A

Institutions	M/FAR, including CCD, and DWLC. CEA is developing a management model	Jurisdictional overlaps occur	Organisational co-operation mostly adequate, but would profit from revival of NWSC	Yes, more training needed	Yes, because of donor assistance	Yes, because of donor assistance
Extension, awareness	M/FAR in relation to fisheries aspects; CEA in general; DWLC through National Wetland Day	Good quality	Co-operation ceased when NWSC stopped functioning	Shortage of trained staff	Not given enough priority	No
Resource users	Fishermen, local communities living around coastal wetlands, tourists	Uses often not sustainable	No, except in Muthurajawela and Rekkawa	Yes	Yes	Yes
Management plans	Prepared for many areas by CEA (Wetland Conservation Project). CCD prepared a Special Area Management Plan for Rekawa lagoon	Developed through participatory methods. Not all areas are covered	Yes, in the areas for which plans were made	Yes	Yes	Not known
Procedures	Procedures in accordance with the mandates of the organisations involved	Sometimes not adequately field oriented	National Wetland Steering Ctee (NWSC), but not functioning	Yes	Not known	Not known
Implementation	Various plans being implemented through government- or donor-supported programmes	Sometimes good, sometimes not. No set pattern; CEA is developing a model for replication	Yes, when one agency takes the lead. Stakeholder participation progressing	Lack of skilled staff	No	No
Monitoring	Done wherever management plans are being implemented, and if management plans show indicators to be monitored	Adequate, where baselines were available	Not all interested parties participate in monitoring	Yes	Yes	Yes

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 16

RESOURCE: COASTAL AND MARINE RESOURCES - TRADE IN MARINE SPECIES

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Not developed, most activities are illegal	N/A	N/A	N/A	N/A	N/A
National policy	National Policy on Wildlife Conservation (1990) and Biodiversity Conservation Action Plan (1999)	Both have been developed through a participatory process	Yes	Yes	N/A	N/A
Internat. obligations	Convention on International Trade in Endangered Species of Fauna and Flora (CITES)	Yes	Organisational framework for meeting international obligations is in place	Need for trained customs personnel for prevention of illegal export	Inadequate for training and enforcement	Not known
Legislation	Fisheries and Aquatic Resources Act and Fauna and Flora Protection Ordinance	Adequate cover, but quite some overlap, creating some contradictions	Yes	Yes	Yes	Yes
Definitions, mandates	M/FAR; DWLC; Police Department, and Customs Department mandated to detect violations and to act against illegal trade.	Contradictions in legislation create confusion with regard to the mandates of organisations involved	No co-ordinative framework	Lack of staff for effectuation of mandates	Not known	Not enough equipment, training materials, etc.

Institutions	M/FAR, DWLC, NARA, Customs Department; Police Department	Overlapping mandates impede efficiency	No co-ordinative framework	Insufficient trained staff	No - marine sector not prioritised	Insufficient
Extension, awareness	Some awareness creation by NARA and by NGOs (IUCN)	No set criteria or consensus on methodology used	Institutions not geared to handle awareness on marine species	No trained specialist staff	No	No
Resource users	Fishermen, fish traders, consumers, ornamental fish collectors and exporters.	Not (yet) interested in sustainability	No mechanisms to involve stakeholders in resources management	Yes	Yes	Yes
Management plans	None existing	N/A	N/A	?	Yes	Yes
Procedures	Procedures are described, according to the mandates of the respective organisations.	Procedures are not geared to accommodate conservation of marine species	No co-ordination, resulting in no actions	Not adequate	Yes	Yes
Implementation	No resource management, since no plans are existing. Some law enforcement is carried out by the responsible government organisations	Even in law enforcement there are overlaps and discrepancies	Police and Customs Departments are not focusing on the marine sector	Staff not adequately trained in marine species	No	Inadequate equipment and training materials
Monitoring	Some monitoring by NARA	This is a relatively new field; therefore no consensus	Relevant agencies not geared for monitoring trade in marine species	No trained personnel	Inadequate financial resources	Inadequate equipment

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 17

RESOURCE: BIODIVERSITY - HABITATS AND ECOSYSTEMS

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	No national database; DWLC presently developing its own database, excluding coastal and marine habitats	Needs adaptation and centralization	Yes	Yes	No	Yes
National policy	1992 DWLC policy; no policy in M/F&E; coastal policy not stated, but extractable from Coastal 2000	Expected to be revised under ADB-funded project ; needs consolidation	No co-operation structured or planned	Yes	Yes	Yes
Internat. obligations	A large number; most relevant are CBD 1992, Ramsar 1971, MARPOL 1973/78, UN Conv. Law of the Sea 1982, London (Dumping) Conv., UNFCCC 92	Yes	Partly with M/F&E, partly with DWLC; no co-ordination mechanisms	Yes	Yes	Yes

Legislation	F&F Prot. Ordinance 1937/93, Forest Ordinance 1907/amendments, Fisheries and Aquatic Resources Act 1996, National Heritage Wilderness Act 1988; Plant Protection Act 1999 a.o.	Needs review, amendments and mutual concurrence	No working group established	Yes	N/A	N/A
Definitions, mandates	DWLC, FD, and M/FAR have direct authority over establishment and management of PAs and biodiversity found outside PAs. DA and DWLC responsible for introductions	No correspondence between laws and policies; mandates not all in laws; overlaps	No initiatives taken to streamline the situation	New staff have been recruited, but ongoing training required	Yes	Yes
Institutions	DWLC, FD, M/FAR, M/F&E, DA, CCD, CEA, Department of Animal production and Health	Mandates not all clear; overlaps	No co-ordination	Training needed	Not Known	Tools for generating/ processing of data needed
Extension, awareness	Yes, mainly by NGOs and universities/researchers	Could be further upgraded	No co-ordination	Yes	No	No
Resource users	State, local communities, industry (including extraction of raw materials and disposal of externalities), research community, public/citizens	No principles of sustainability	Co-ordination between resource users needed	Yes	Yes	Yes
Management plans	DWLC for PAs; DA for agro-ecosystems; Coastal Zone Management Plan for SAM areas; CEA for 22 wetlands (+ general guidelines)	Variable quality, but suitable foundations for management	Only here and there steering groups. Transfer of govt. staff affects continuity and ownership	Yes, but periodic training needed	No	Yes

Procedures	Not for designation of PAs, Fisheries Act allows PAs for both conservation and management. Procedures species- and not ecosystem directed	Most procedures confusing and not easy to enforce. Cumbersome survey procedures	No. Planning and budgeting processes in many state sectors do not reflect management activities required, due to lack of co-ordination	Yes	Yes	Yes
Implement- ation	(Partial) implementation of legislation and management plans only if a donor or NGO is interested	Yes, if done	No co-ordination platform; no pressure from responsible agencies	Training needed	No	No
Monitoring	None; no mechanism, except in the framework of management projects	Yes, if done	No high-level government institution to monitor	?	Not known	Not Known

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 18

RESOURCE: BIODIVERSITY - GENETIC POOL

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	No national database. Data dispersed Plant Genetic Resources Centre, Microbial germplasm storage centres, Zoological Survey of Sri Lanka, National Herbarium, Royal Botanical Gardens, Zoological Gardens, Universities and State research institutions (crop-directed)	Yes for agricultural crops, No for others	No national initiative to consolidate data	Trained personnel needed	?	Technologies outdated and inadequate
National policy	None, except in the case of agricultural and export crops	Yes, if present	Required in the framework of the BCAP	Yes	?	?
Internat. obligations	CBD 1992; CITES 1973; Bonn Convention 1979	Yes	None	N/A	N/A	N/A
Legislation	Limited (in National Heritage Wilderness Areas Act, 1988) and inadequate	Needs revision, to address conservation at the genetic level or of gene pools	Initiatives taken by M/F&E with IUCN assistance	Training of staff required	Yes	Yes

Definitions, mandates	None, except for crop research institutes	N/A	Will follow from initiative M/F&E	Yes	Yes	Yes
Institutions	Department of Animal Production and Health, Agricultural research Institutes, Medical Research Institute, Botanical Gardens, National Herbarium, National Museum, and others	No special new institution; no clear definitions and mandates as yet for the existing ones, except for crop research institutes	N/A	Training of staff will be required	No	No
Extension, awareness	Only for agricultural crops	Inadequate	Requires a mandated institution	N/A	N/A	N/A
Resource users	Farmers, horticulturists, livestock farmers, academic and commercial researchers	N/A	Only for agriculture and domestic animals	N/A	N/A	N/A
Management plans	In the agricultural research institutions	Yes, if present	Yes, if present	Yes	Yes	Not known
Procedures	Established in crop research institutes; none developed for other genetic resources	Yes, if present	N/A	N/A	N/A	N/A
Implementation	N/A	N/A	N/A	N/A	N/A	N/A
Monitoring	N/A	N/A	N/A	N/A	N/A	N/A

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 19

RESOURCE: SURFACE WATER QUANTITY

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Data collection by Irrigation Department, Mahaweli Authority of Sri Lanka, Housing Ministry, National Water Supply and Drainage board; availability scattered	Consolidation of data bases required; draft National Water Resources Policy identifies need for improved quality, accessibility and efficiency of data	Plans are underway for National Water Resources Authority as water sector apex body, resp. for co-ordinating, planning, regulating and monitoring national water resources	Institutions involved have adequate manpower for the management of database	No, but ADB NORAD and AUSAID fund programs under National Water Resources Secretariat	Yes. Several detailed River basins studies are underway under bilateral assistance programs
National policy	National Water Resources Policy (incl. management) has been formulated and is presently awaiting cabinet approval	Policy drafted thr. consultative process and co-ordinated by Committee under the Ministry of Finance and Planning	Institutional arrangements have been recommended for the implementation of the policy	Will be, when NWRA is set up	Donor funds available	Final draft of the policy document is available
Internat. obligations	Global Water Partnership, which is represented in Sri Lanka through SASTAC	Presently inadequate	Proposed NWRA will provide framework for international obligations	Not at present	Some funding may be required	No
Legislation	Scattered at present; National Water Resources Act is in the final draft stage	Will become adequate when NWRA Act is enacted	NWRA Act drafted through several consultative processes	Envisaged under the new Act	Sector inadequately funded	Sector inadequately funded

Definitions, mandates	Actions have been identified in the draft action plan	Yes	Yes	Yes	Capacity building required	Internal process funded	Inadequate
Institutions	Establishment of NWRA is under consideration for January 2001	Decision is based on the needs identified in the national policy	Draft organizational Framework ready	No	No	No	No
Extension, awareness	Not adequately done	Pilot projects are carried out with the assistance of the Ministry of Education and higher education	Extension/awareness mostly carried out by NGOs. Activities coordinated by the Water Resources Secretariat thr. existing agencies	No	No	No	No
Resource users	Resource Users have been identified in the major river basins	Yes, but all the river basins have not yet been studied	Being identified in the detailed assessments; no user organizations	Assessments being carried out	Some donor funding available	Not adequate	Not adequate
Management plans	Not adequately covered. Attempt has been made to prepare management plans based on River basins. This activity is on-going	Being done through stakeholder participation	Being identified in the detailed assessments	Under study at present	Some donor funding available at present	Not adequate	Not adequate
Procedures	Some guidelines available in existing agencies	Inadequate	To be re-assessed after formulating NWRA	No	No	No	No
Implementation	At present surface water management is a function of several institutions	Gaps being identified in the newly drafted policy	Draft policy identifies preparation of river basin plans, to serve as management plans under responsibility of NWRA	Mahaweli Authority, Yes; proposed NWRA, No	No	No	No
Monitoring	Proposed NWRA will take over the monitoring functions	No consensus now. Will improve when NWRA is set up	Will be set up after the new authority is established	To be trained	Some funding available but inadequate	No	No

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 20

RESOURCE: SURFACE WATER QUALITY

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Database scattered over CEA, CISIR, NBRO, Dept. Irrigation, dependent upon needs	No, collating/consolidation required	Yes, by CEA	Specialized training required.	Some financial resources required	Laboratories available for qual. analysis
National policy	National Water Resources policy (in draft form); Industrialisation policy	Yes, done thru intensive participation	Not at present	To be built up	Some required	N/A
Internat. obligations	Compliance with ISO 9000 and ISO 14,000	Not yet	Industrialists being supported in achieving obligations	Training required to achieve ISO 14,000	Some funding is required	Laboratory strengthening required
Legislation	National Environmental Act and Acts relating to Provincial Environmental Agencies	Yes	Yes, with CEA	Yes	Yes	Yes
Definitions, mandates	River and ground water management plans to be prepared including environmental assessment	To be achieved	To be assessed	Capacity building needed	Funding required	No

Institutions	Proposed NWRA will fully co-ordinate with CEA and Provincial Environmental Agencies; standards and tolerance limits set by Standards Institute	Not at present; no authority responsible for ambient water quality.	Yes	Yes	Funding required	No
Extension, awareness	Undertaken by CEA and provincial environmental agencies	Targeted awareness for specific stakeholders required	Yes	Yes	Funding required	Yes
Resource users	Population as a whole	No awareness; no quality management	No water users organizations planned	Yes	Yes	Yes
Management plans	Links to be established between basins and ground water plans	Not yet established	Requires agency coordination at high level	Yes	Yes	Yes
Procedures	Standards available for point source discharge from tanneries, rubber and textile factories into surface, coastal and irrigation waters. No plan for stream flows to maintain ambient quality	Requires continuous updating and expanding to other sources	No international links (twinning) established	Staff training required	No	No
Implementation	CEA, Local Governmental authorities and Provincial Env. Agencies are involved in implementation of quality management, mainly in GCA	Still to much case-based; no routines and not related to groundwater	Yes, between agencies, but not with local population	Yes	Some funding is required	Local authorities need additional material support
Monitoring	Water quality monitoring is done regularly by the CEA on selected sites in association with local government authorities	Monitoring is done in keeping with the accepted standards, but on relatively small scale	In place. NWRA will strengthen existing organizational framework. Some devolution required	Additional training will be required	Additional funding may be required	Laboratory arrangements to be improved, esp. at provinc. level

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 21

RESOURCE: GROUNDWATER

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Water management agencies collect data for own use, and at ad-hoc or project basis. No national models on quantity or quality. Several studies and well-drilling data available	Not adequate; data collection and info management to be strengthened, focusing on proximity to aquifers	Proposed setting up of NWRA and Water Resources Board will provide adequate organizational framework	Yes	No	No
National policy	Ground water management policy stated in Draft National Water Resources Policy; quality issues not properly addressed	Inadequate; ground water is essentially seen as unregulated resource	Ownership and management responsibilities not clearly defined	Yes, capacity building required	Funding required	Yes
Internat. obligations	Global Water Partnership	Yes	Currently not adequate	N/A	N/A	N/A
Legislation	State Lands Ordinance, Irrigation Ordinance, MASL Act. NWSDB Law & Act, 13 th Amendment in Constitution, Water Resources Board Act	Inadequate. No legislative basis for proper assessment, planning and management	To be arranged under NWRA	No	Yes	No
Definitions, mandates	Ownership/management responsibilities not clearly defined in legislation	To be improved	To be arranged under NWRA	Yes	Yes	Yes

Institutions	Water Resources Board, National Water Supply and Drainage Board, Agricultural Development Authority involved in ground water investigation and management	Not adequate	None of the agencies is responsible for (co-ordination of) management of the ground water resources in the country	No	No	No
Extension, awareness	Awareness on value of water, adverse effects from extraction from vulnerable aquifers and opportunities for water conservation to be promoted through public education/awareness activities	Inadequate	No mandated organization	No	No	No
Resource users	Mainly industries and private deep tubewell users; fast-growing extraction	No awareness of limitations/quality	Not involved in management planning	Yes	Yes	N/A
Management plans	Not available	Action plans required for water users and government agencies to achieve demand management objectives	No responsible agency	No	No	No
Procedures	Not formally assigned to any agency, involvement of agencies is a consequence of other mandates	Inadequate to sustain quality and quantity; proper legal basis to be established	No responsible agency	No	Yes	Yes
Implementation	Being an essentially unregulated resource, problems/issues dealt with on ad-hoc basis	Inadequate; objectives to be set	No responsible agency	No	No	No
Monitoring	No on-going monitoring	To be established	No responsible agency	No	No	No

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 22

RESOURCE: LAND USE PLANNING

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Scattered in several agencies; no data bank on physical losses, loss of fertility, water logging, pesticide residues	Data and maps have to be upgraded (GIS) and consolidated	No co-ordinating agency;	Training required	No	No
National policy	Draft Land Use Policy Document, prepared by LUPPD; National Policy Framework for agriculture, but no national soil conservation policy	Not sufficient detail to allow decentralized planning; Draft policy document prepared in participatory process; does not focus on sustainable use of soils	No national co-ordinating body for soil conservation	Training required	No	No
Internat. obligations	CBD 1992/94; Agenda 21 requests a land use policy from signatories	Yes	No national co-ordinating body; Land Commissioner should take initiative	Yes	N/A	N/A
Legislation	Land Acquisition Act 1958/ 64; Land Development Ordinance 1969/71; Land Reform Law 1972/75; Land Reform Act 39, 1981; Mines and Minerals Act 1992; Land Settlement Ordinance 1996	Overlapping areas create confusion and need to be identified. Soil conservation legislation lacking	No existing forum; probably M/F&E is mandated to review and consolidate legislation	No	No	Yes

Definitions, mandates	Sectoral, resulting in many agencies dealing with land issues, incl. Land Commissioner, SLLRDC, LUPPD, UDA, MASL, M/F&E, at national, provincial, district and divisional levels. No suitable programmes to address loss of soils and soil fertility	Unsatisfactory, especially for overlapping and cross-cutting issues. Responsibilities for soil conservation not clear	No existing forum; probably M/F&E is mandated to review and consolidate legislation	No	No	No (GIS)
Institutions	Sectoral, e.g. LUPPD for agricultural matters, Land Commissioner for cadastral matters, CEA for pollution	Inadequate; requires improvement and settling of crosscutting issues	Needs national approach, preferably combined with property tax issues	No	No	No
Extension, awareness	None	Inadequate	No national co-ordinating body	No	No	No
Resource users	General public, farmers, State and State organizations, industries	Conflicts common because of inadequate management. Farmers not aware of impacts; soil use unsustainable	No national co-ordinating body; Land Commissioner and DA should take initiatives	No	No	No
Management plans	Indicative Land Use Plans at Divisional Secretariat level in preparation (thr LUPPD). No detailed planning for improved soil use, incl. reclamation and settlement	No relation to national or cross-border (of divisions) issues. Detailed Land Use Planning required	No national co-ordinating body	Yes, but more training needed	Yes	Yes
Procedures	Not clear, except for ownership and pollution	Need national and regional planning	No national co-ordinating body	No	No	No

Implement - ation	Divisional Secretaries for Indicative Land Use Plans	Inadequate; cross- cutting issues are not considered, and long- term effects of interventions not well known	No national co-ordinating body	Yes	Yes	Yes
Monitoring	Divisional Secretaries for Indicative Land Use Plans	Inadequate; for local matters only	No national co-ordinating body	Yes	Yes	No (GIS)

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 23

RESOURCE: SOLID WASTE/SOIL POLLUTION

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Only available for Greater Colombo Area (GCA). Ad hoc data for other areas	Extensive work done by Western Provincial Council; consensus for GCA only	No	Training required at local authority level	No; some WB assistance through CEIP	No
National policy	Not available. National solid waste management strategy prepared by M/F&E; to be updated when new processing techniques become available	National policy should be developed to facilitate implementation of strategy	Policy should encourage private sector involvement/privatization in solid waste collection/disposal	Need for multisectoral partnerships	Some funding available	R&D and new techniques required (re-cycling, re-use, etc.)
Internat. obligations	Basel Convention for Hazardous Waste	Yes	Yes; focal point M/F&E, implementation by CEA	Yes	Some thr. Convention	Yes
Legislation	Solid waste legislation adequately provided in local Government Acts, municipal ordinances, Urban Council ordinance, Pradeshiya Sabha Act, National Environmental Act (EIA)	Yes	Local authorities responsible for collection and disposal of solid waste	Yes	No	No

Definitions, mandates	Responsibilities for solid waste clearly devolved to local authorities	Yes	No. Establishment of Waste Mgmt Authority proposed to co-ordinate planning in GCA	Yes, when community participation is achieved	Yes	Yes
Institutions	None; suitable institutional set-up required for implementation of solid waste strategy. DA to look after loss of soil fertility, water logging, pesticide residues	None	National co-ordination initiated by President; at provincial and local level required	Yes	No; local auth. should be given financial incentives	No; local authority should be given technical incentives
Extension, awareness	Well defined in draft strategy; presently carried out by NGOs and some local authorities. Reduction/re-use/recycling being promoted	Yes	Localized; no central authority	Yes	Some funding available	Yes
Resource users	Strategy unclear in this respect	Strategy lacks extension/education for private sector	No participatory approach	Yes	?	?
Management plans	Absence of coherent plan for GCA and elsewhere. CEIP formulated actions for improved solid waste mgmt in GCA	Planning of infrastructure required	No. Establishment of Waste Mgmt Authority proposed to co-ordinate planning in GCA	No	No	No
Procedures	Key recommendations for long/short term actions made to Presidential Task Force on solid waste mgmt	Yes, but implemented ad-hoc only	Localized; no central authority	No	?	?
Implementation	Inadequate and ad-hoc	Inadequate and ad-hoc	Localized; no central authority, no awareness creation, no community participation	No	No	No sanitary or hazardous waste disposal facility
Monitoring	None	N/A	No central authority	Yes	Yes	No

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 24

RESOURCE: RIVERS AND WATERSHEDS

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Only for the Upper Watershed of the Mahaweli basin	No	No. Riverbasin committees proposed to be set up to link to provincial/district/divisional/local governments and to other stakeholders at a local level	No	No	No
National policy	Addressed in the National Water Resources Policy (in draft)	Yes	Yes, to be carried out through various line agencies and Ministries	Yes	No	No
Internat. obligations	Global state partnership					
Legislation	Mahaweli Authority Act (only for Mahaweli Basin); Crown lands Ordinance; Irrigation Ordinance	Only for Mahaweli Basin	Adequate only for the Mahaweli Basin	Only for Mahaweli	No	No
Definitions, mandates	MASL - responsible for management of Mahaweli river. Devolved administrative structure	Relationship between MASL and the proposed NWRA to be cleared	Inadequate	No	No	No

Institutions	Co-ordinated approach to river basin planning and management is lacking	Integrated river basin management required	Scattered in various state agencies	scattered	No	No
Extension, awareness	Inadequate and ad-hoc. Mainly focused on Mahaweli basin	No	No	No	No	No
Resource users	Management of river basins by all its resource users is unrealistic, but they should be aware of each others interests	Not yet existing	Lack of co-ordination; NWRA will co-ordinate	Yes, spread out over different national/local agencies	No	No
Management plans	Lacking - currently being undertaken for some river basins for declaration as water management areas and basin plans	Not at present	Not co-ordinated at present. Will emerge from basin management plans	No	No	No
Procedures	Not available for most major river basins - only available for Mahaweli	N/A	N/A	N/A	N/A	N/A
Implementation	Good implementation arrangements at MASL. NWRA will co-ordinate all implementation once established	N/A	N/A	N/A	Planned by ADB	N/A
Monitoring	Only for Mahaweli. Rest on an ad-hoc basis	Not clear	Not co-ordinated at present. Will emerge from basin management plans	Yes	Yes	?

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 25

RESOURCE: AIR QUALITY

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Soma data with CEA and NBRO	For Colombo only: not systematically collected	Yes, in CEA	Yes	No	Yes
National policy	National Policy on Air Quality Management, approved by Cabinet	Yes	Yes	Yes	No	Yes
Internat. obligations	Male Declaration on Prevention of Air Pollution and likely transboundary effects in South Asia; Montreal Protocol	Yes	Yes; CEA mandated	Yes	No	No
Legislation	National Environmental Act; Smoke emission standards for Diesel vehicles, National ambient air quality standards gazetted; Mobile vehicle emission standards and Fuel standards to be gazetted in July 2000 (Supreme Court order)	Yes	Yes	Yes	Yes	Yes
Definitions, mandates	Clear, following EA1P appraisal	Yes	Yes	Yes	Yes	Yes

Institutions	CEA; NBRO; Provincial Councils	Not equipped to meet standards	No clear co-ordination structure	Yes	No	No
Extension, awareness	Carried out by CEA	No; wider extension programmes for more stakeholders needed	Yes, at CEA	Yes	No	Yes
Resource users	General public	Complaints, but no action, largely due to lack of awareness and no enforcement	N/A	Yes	Yes	Yes
Management plans	Clean Air 2000 Action Plan	Yes	Yes	Yes	No; only 8 out of 55 emissions addressed	No
Procedures	Standards gazetted or being gazetted; legal actions set	Yes	Yes	Yes	Yes	Yes
Implementation	Being done by CEA and NBRO	No; haphazardly, ad-hoc, and sub-standard	Yes	Yes	No	No
Monitoring	Ad-hoc by NBRO; private sector involvement envisaged	No	No; responsibilities unclear	Capacity building required	No	Equipment required

MATRIX FOR IDENTIFICATION OF RESOURCE MANAGEMENT ISSUES, part 26

RESOURCE: ENERGY (from natural resources)

	Is it done? Is it clear what has to be done?	If done, is there consensus on the quality?	Adequate organizational framework?	Are there adequate human resources?	Are there sufficient financial resources?	Are there sufficient material resources?
Data Base	Some data available with the CEB	No, not systematic	Yes	Yes	Yes	Yes
National policy	Forestry Sector Master Plan (Biomass); Least cost energy generation plan; Energy policy	No reforms as reflected in the National Environmental Action Plan (NEAP)	Institutional responsibilities not focused	Yes	No	No
Internat. obligations	Transport policy. National Environmental Action Plan. Those that have a bearing on air pollution - like Montreal Protocol	Not taken into account by CEB	No co-ordination	Yes	Yes	Yes
Legislation	National Environmental Act; RDA Act; CEB Act	Updates being done	Co-ordination required	Yes	Yes	Yes
Definitions, mandates	Clear for energy sector from point of view of energy only; co-ordination lacking	No	Lack of co-ordination	Yes	Yes	Yes
Institutions	CEB, RDA, CEA	No; conflicting interests not solved	Lack of co-ordination	Yes	No	No

Extension, awareness	Done by the various sectoral agencies and by some NGOs in the framework of projects	No; inefficient and inadequate; no demonstrations	Yes	Yes	No	No
Resource users	Public, private sector, industrial sector	Sufficient interest in use of clean technology, but only few practice	No framework	Yes	Yes	?
Management plans	Least cost energy generation plan	Set up by energy sector in isolation; EA for the entire energy sector is required	No co-ordination between interested parties	Yes	Yes	?
Procedures	Should be clearly defined with shift in policy	Unclear at present	No co-ordination between stakeholders	Yes	No	No
Implementation	Carried out by CEB, RDA	Emphasis on engineering aspects only; no sustainability	No co-ordination between interested parties	Yes	Yes	No
Monitoring	Done on an ad-hoc basis	Emphasis on energy output only; no sustainability	No co-ordination between interested parties	Yes	No	No

ANNEX D

Stakeholders matrices

MATRIX FOR STAKEHOLDER ANALYSIS IN BIODIVERSITY MANAGEMENT

ACTIVITY STAKEHOLDER	policy setting	legislat- ion, rules	extension PA	planning	budget- ting	data collection	database mgmt	implement ation	enforce- ment	coordi- nation	monitor- ing
M/F&E	X	X		X	X	X	X		X	X	X
M/FAR	X	X	X	X	X	X	X	X	X	X	X
M/Agriculture	X	X		X	X	X	X	X	X	X	X
CCD	X	X	X	X	X	X	X	X	X	X	X
CEA	X	X		X	X	X	X	X	X	X	X
DWLC	X	X	X	X	X	X	X	X	X	X	X
NARA	X	X	X	X	X	X	X	X	X	X	X
Forest Department	X	X	X	X	X					X	X
Loc. Govt/Prad. Sabas	X	X		X	X	X	X	X	X	X	X
Provincial Councils	X	X	X	X	X	X	X	X	X	X	X
NGOs/INGOs	X		X	X	X	X	X	X	X	X	X
Public	X		X	X		X	X	X	X	X	X
Universities	X	X	X	X		X	X	X		X	X
Donors						X		X		X	X
Private sector	X	X	X			X		X		X	X
Customs/Quar. Dept.	X	X						X	X	X	X

MATRIX FOR STAKEHOLDER ANALYSIS IN FORESTS AND PROTECTED AREAS MANAGEMENT

ACTIVITY STAKEHOLDER	policy setting	legislat- ion, rules	extension PA	planning	budget- ting	data collection	database mgmt	implement ation	enforce- ment	coordi- nation	monitor- ing
M/F&E	X	X		X	X	X	X	X	X	X	X
FD	X	X		X	X	X	X	X	X	X	X
M/Agriculture	X	X		X	X	X	X	X	X	X	X
CEA	X	X		X	X	X	X	X	X	X	X
Land use pol.pl. unit	X	X		X	X	X	X	X	X	X	X
DWLC	X	X	X	X	X	X	X	X	X	X	X
M/Irrigation&Energy	X	X	X	X	X	X	X	X	X	X	X
MASL	X		X	X	X	X	X	X	X	X	X
Loc.Govt/Prad.Sabas	X	X	X	X	X	X	X	X	X	X	X
Provincial Councils	X	X	X	X	X	X	X	X	X	X	X
NGOs/INGOs	X		X	X	X	X	X	X	X	X	X
Public	X		X	X		X	X	X	X	X	X
Universities	X	X	X	X		X	X	X		X	X
Donors						X		X		X	X
STC	X	X				X	X	X	X	X	X

MATRIX FOR STAKEHOLDER ANALYSIS IN COASTAL RESOURCES MANAGEMENT												
ACTIVITY STAKEHOLDER	policy setting	legislat- ion, rules	extension PA	planning	budget- ting	data collection	database mgmt	implement ation	enforce- ment	coordi- nation	monitor- ing	
M/FAR	X	X	X	X	X	X	X	X	X	X	X	X
M/F&E	X	X		X	X	X	X		X	X	X	X
M/A&T	X	X		X	X	X	X	X	X	X	X	X
CCD	X	X	X	X	X	X	X	X	X	X	X	X
CEA	X	X		X	X	X	X	X	X	X	X	X
DWLC	X	X	X	X	X	X	X	X	X	X	X	X
NARA	X	X	X	X	X	X	X	X	X	X	X	X
SLLRDC	X	X		X	X					X		X
Loc.Govt/Prad.Sabas	X	X	X	X	X	X	X	X	X	X	X	X
Provincial Councils	X	X	X	X	X	X	X	X	X	X	X	X
NGOs/INGOs	X	X	X	X	X	X		X	X	X	X	X
Public	X		X	X		X	X	X	X	X	X	X
Universities	X	X	X	X		X	X			X	X	X
Donors	X		X	X	X	X		X		X	X	X
Private sector	X	X	X			X		X		X		X

MATRIX FOR STAKEHOLDER ANALYSIS IN WATER QUANTITY AND QUALITY MANAGEMENT											
ACTIVITY STAKEHOLDER	policy setting	legislat- ion, rules	extension PA	planning	budget- ting	data collection	database mgmt	implement ation	enforce- ment	coordi- nation	monitor- ing
M/Housing & PU	X	X		X	X	X				X	
M/F&E	X	X			X		X			X	
NWSDB	X		X	X	X	X	X	X	X	X	X
Dept. Nat. Planning	X			X							
Local Gov. authorities	X	X	X	X	X	X	X	X	X	X	X
Provincial Councils	X	X	X	X	X	X	X	X	X	X	X
Nat. Water Secret.	X	X		X		X	X			X	
Comm. W&S&S project			X	X	X			X		X	
Dept. of Irrigation			X	X	X	X		X		X	X
M/Irrigation-Energy	X	X			X					X	
MASL	X	X	X	X	X	X	X	X		X	X
Water Resources Brd	X		X	X		X	X	X	X	X	X
CEA	X	X	X			X	X		X	X	X
Local NGOs			X			X		X	X	X	
INGOs			X					X		X	
Donors					X					X	
General public	X		X	X				X	X	X	X
Universities			X			X	X	X		X	X
CEB	X	X	X	X	X	X	X	X	X	X	X
M/Finance & Planning		X		X	X		X			X	

MATRIX FOR STAKEHOLDER ANALYSIS IN LAND, LAND USE AND SOIL QUALITY MANAGEMENT											
ACTIVITY STAKEHOLDER	policy setting	legislat- ion, rules	extension PA	planning	budget- ting	data collection	database mgmt	implement ation	enforce- ment	coordi- nation	monitor- ing
M/F&E	X	X	X	X	X	X	X	X	X	X	X
M/Lands	X	X	X	X	X	X	X	X	X	X	X
DWLC	X	X	X	X		X		X	X	X	X
FD	X	X	X	X		X		X	X	X	X
Land Comm. Dept.	X	X	X	X	X	X	X	X	X	X	X
CEA	X	X	X	X			X		X	X	X
SLLRDC	X	X	X	X		X	X	X	X	X	X
Police									X		
Attorney-General									X		
Private sector	X	X	X							X	X
Dept. of Agriculture	X	X	X	X	X	X	X	X	X	X	X
Universities	X										
Research organisat's	X			X		X					
NGOs/CBOs	X	X	X	X				X	X	X	X
Farmers	X	X	X	X				X	X	X	X
Teachers/schoolchild.			X						X		
Provincial Councils	X	X	X	X	X	X	X	X	X	X	X
MASL	X	X	X	X				X	X	X	X
Dept. of Irrigation	X	X	X	X				X	X	X	X
Survey Department			X			X				X	X

MATRIX FOR STAKEHOLDER ANALYSIS IN AIR QUALITY MANAGEMENT

ACTIVITY STAKEHOLDER	policy setting	legislat- ion, rules	extension PA	planning	budget- ting	data collection	database mgmt	implement ation	enforce- ment	coordi- nation	monitor- ing
M/F&E	X	X		X	X	X	X	X		X	
M/Industries	X	X		X	X	X	X	X	X	X	X
BoI	X	X	X	X		X	X	X	X	X	X
CEA	X	X		X		X	X	X	X	X	X
M/Transp. & Highways	X	X		X		X	X	X		X	X
Comm. Motor Traffic	X	X	X	X	X	X	X		X	X	X
M/Housing & Pub. Util	X	X		X	X		X	X		X	X
UDA	X	X	X	X	X	X			X	X	X
Loc. Govt/Prad. Sabas	X	X	X	X		X	X	X	X	X	X
Provincial Councils	X	X	X	X	X	X	X	X	X	X	X
NGOs/INGOs	X		X				X	X		X	X
RDA	X	X			X	X					
NBRO						X	X				X
Public	X		X	X		X	X	X	X	X	X
Universities	X		X	X		X	X	X		X	X
M/Planning & Finance	X	X		X	X						
Private sector	X			X	X			X		X	X
Development banks	X								X	X	
Police Department	X	X				X	X		X	X	X

ANNEX E

Agenda of the Consensus-building Workshop

ENVIRONMENTAL SECTOR STUDY

Consensus-building Workshop, 30 March 2000,

Hotel Transasia, Empress Suite, 15.30-17.00

PROGRAMME

- 15.30*** ***Welcome; background and objectives of the Study***
Mr Peter Kuperus, Head Development Co-operation,
Royal Netherlands Embassy, Colombo
- 15.45*** ***Approach to the Study; Data collection***
Mrs Shiranee Yaseratne, Country Representative IUCN
- 16.00*** ***Data analysis, followed by prioritisation of issues***
Mr Hans van Zon, Senior Consultant Natural Resources
Management, Arcadis Euroconsult, the Netherlands
- 16.40*** ***Discussion on results of prioritisation*** *x 20 minutes*
- 17.00-18.00*** ***Drinks and snacks; informal continuation of discussion***

ANNEX F

Legislation with impact on resources management

ANNEX E

LEGISLATION WITH IMPACT ON RESOURCES MANAGEMENT

TITLE	YEAR	AMENDMENTS (YEARS)
Agrarian Research and Training Institute Act	1972	1981, 1995
Agricultural products (Regulation) Ordinance	1964	
Animal Diseases Act	1992	
Animal Feed Act	1986	
Ayurveda Act	1961	1962, 1969, 1977, 1978
Ayurvedic Medical Council Ordinance	1961	
Botanic Gardens Ordinance	1973	
Ceylon Tourist Board Act	1966	1988
Ceylon Tea Board Act	1970	1975
Ceylon State Plantations Corporation Act	1958	1962, 1979, 1985
Chank Fishery Act (repealed by Fisheries Act)	1996	
Coast Conservation Act	1981	1988, 1992
Coconut Development Act	1971	1975, 1986, 1986, 1987, 1987, 1988
Coconut Development (Special Provisions) Act	1984	1987
Coconut Products Ordinance	1962	1967, 1984
Coconut Research Ordinance	1957	1959, 1961, 1984
Code of Intellectual Property Act	1979	1982, 1983, 1990, 1999
Contagious Diseases (Animals) Ordinance	1957	1992
Control of Pesticides Act	1980	1994
Co-operative Societies Act	1978	
Co-operative Societies Law	1972	1974, 1982, 1983, 1992
Co-operative Societies Ordinance	1958	1961, 1964
Co-operative Societies (Special Provisions) Act	1972	
Co-operative Societies (Special Provisions) Act	1968	
Co-operative Societies (Special Provisions) Act	1970	
Co-operative Societies (Special Provisions) Act	1969	
Cultural Property Act	1988	
Customs Ordinance (Cap. 235)		
Dangerous Animals Ordinance (Cap. 49)		
Department of Agriculture Ordinance (Cap. 441)		
Elephant Kraal Ordinance (Cap. 471)		
Enlargement of Powers (Urban Councils, Town Cs & Village Committees) Act	1958	
Fauna and Flora Protection Ordinance	1937	1964, 1970, 1993, 1996
Felling of Tress (Control) Act (Cap. 452)		
Fertilisers Act	1961	
Fisheries and Aquatic Resources Act	1996	
Fisheries (Regulation of Foreign Fishing Boats) Act	1979	1982
Forests Ordinance	1907	1966, 1979, 1982, 1988, 1995, 1996
Imports and Exports (Control) Act	1969	1985, 1987
Industrial Development Act	1969	
Irrigation Ordinance (Cap. 453)	1968	1973, 1983, 1990, 1994
Land Acquisition Act (Cap. 460)	1958	1964, 1969, 1979, 1973, 1986
Land Development Ordinance (Cap. 464)	1969	1971, 1973, 1973, 1978, 1981, 1983, 1993, 1995, 1996
Land Reform Law	1972	1975, 1981, 1981, 1983, 1986
Land Reform (Special Provisions) Act	1981	1986, 1986
Land Settlement Ordinance	1996	
Local Authorities Housing Act	1965	1979
Mahaweli Authority of Sri Lanka Act	1979	1993

Mahaweli Development Board Act	1970	1976, 1983
Mahaweli Development Board (Repeal) Act	1983	
Marine Pollution Prevention Act	1981	
Marine Pollution Prevention Act	1976	
Mines and Minerals Act	1992	
Municipal Council Ordinance (Cap.252)	1957	1958, 1959, 1961, 1961, 1967, 1967, 1968, 1969, 1971, 1973, 1974, 1975, 1975, 1977, 1977, 1979, 1979, 1979, 1981, 1981, 1981, 1983, 1983, 1983, 1985, 1986, 1987, 1987
National Aquaculture Development Authority of Sri Lanka Act	1998	
National Aquatic Resources R&D Agency Act	1981	1996
National Environment Act	1980	1988
National Heritage Wilderness Areas Act	1988	
National Housing Act (Cap. 401)	1958	1966, 1978, 1981
National Housing Development Authority Act	1979	1982, 1988
National Institute of Plantation Management Act	1979	1981, 1987
National Water Supply and Drainage Board Law	1974	1992
National Zoological Gardens Act	1982	
Plant Protection Act	1999	
Provincial Councils Act	1987	1990, 1990
Quarantine and Prevention of Diseases Ordinance (Cap.222)		
Road Development Authority Act	1981	1998
Road Development (Special Provisions) Act	1988	
Rubber Research Ordinance (Cap. 439)	1957	1957, 1959, 1961, 1976, 1979, 1978, 1983, 1987
Science and Technology Development Act	1994	
Sri Lanka export Development Act	1979	
Sri Lanka Fruit Board Law	1973	
Sri Lanka Land Reclamation and Development Board Act	1968	1976, 1982
Sri Lanka Ports Authority Act	1979	1984, 1984, 1992
Sri Lanka Ports Authority (Special Provisions) A	1970	
Sri Lanka Tea Board Law	1975	1978, 1983, 1985, 1990
State Agricultural Corporation Act	1972	1980
State Lands (Special Provisions) Law	1972	
Sugar Cane Research Institute Act	1981	1982
Tea Control Act	1957	1962, 1966, 1974, 1975, 1978, 1983, 1983, 1993
Tea Research Board Act	1993	
Tea Small Holdings Development Law	1975	1991, 1997
Tourist Development Act	1968	1981, 1987, 1991
Town and Country Planning Ordinance (Cap.269)	1981	
Urban Development Authority Law	1978	
Urban Council Ordinance (Cap.255)	1957	1958, 1959, 1961, 1961, 1961, 1967, 1968, 1969, 1971, 1975, 1977, 1977, 1979, 1979, 1979, 1981, 1981, 1983, 1983, 1983, 1984, 1985, 1986, 1987
Urban Development Project (Special provisions) Act	1980	
Urban Development Authority (Special Provisions) Act	1984	
Water Hyacinth Ordinance (Cap.448)		