

APPENDICES

**with the advisory review of the
Environmental Impact Statement
Kerawalapitiya reclamation project,
Sri Lanka**

(Appendices 1 to 6)

APPENDIX 1

Letter of DGIS dated February 14th 1994, in which the Commission is asked to submit an advisory report

Ministerie van Buitenlandse Zaken

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Commissie voor de m.e.r. OS	
Ingingedatum:	23-02-94
Nummer:	286-94
0007/007-1 (OS)	
Sc. Pres. Ima/Bies	

Netherlands Commission for Environmental Impact Assessment
att. Mr. J.J. Scholten
Postbus 2345
3500 GH Utrecht
The Netherlands

Directorate-General
International Cooperation

Date: February 14th 1994

Re: Kerawalapitiya Reclamation Project
WW/92/850, nr. 5
(JRC 381-93)

Ref: DDI-DST
ML/94/089

With reference to conversations between Mr. Christiaanse and Mrs. Wevers of DGIS and Mr. Post of the Commission, I send you the Environmental Impact Assessment Report, december 1993 of the Sri Lanka Land Reclamation & Development Corporation - Kerawalapitiya Reclamation Project, as part of implementation of the Masterplan for Muthurajawela and Negombo Lagoon.

With reference to the Agreement of March 26, 1993, the Commission is requested to form a Working Group for the purpose of reviewing the above mentioned EIA-report, to inform the ministry of the participants and the estimated costs and subsequently to prepare the review-advice about the EIA-report.

The Commission has to take into consideration the fact that the EIA-report is part of the contract that has been negotiated and approved by Srilaut and Zanen V. In this contract a reservation upto a certain amount has been made for mitigating measures.

For further details and preparation of the mission of the Working Group Mr. Christiaanse (DPO/BL The Hague) and Mr. Staring (RNE Colombo) can be contacted. Project proposal, the contract and other relevant documents have been handed over to you already.

THE MINISTER FOR DEVELOPMENT COOPERATION
For the Minister

The Head of the Environment Programme


F.L. Schlingemann

APPENDIX 2

Project information

Proposed Activity:

Realisation of a 162 hectare landfill in Muthurajawela marsh. The fill material is assumed to be medium coarse sand to be extracted by a Suction Dredger from the sea bottom at a borrow area located at least 3 km from the shore line and to be transported as sand/water mixture by means of a pipe. Momentum is to be provided by pumps on the dredger and by a booster station. On the landfill industrial and residential development are foreseen.

Categories:

Sri Lanka National Environmental Act, No. 47

Part 1, categories 2, 6 and 12

Part 3, category 2

World Bank Operational Directive
categories XI, XII,

DAC-CRS code: 91082

Project numbers: WW/92/850, nr. 5 (JRC 381-93)

Progress:

An Environmental Impact Statement has been submitted for review. Tenders have been passed and contracts signed. The Advisory Review has been submitted to the Dutch Ministry of International Cooperation on 29th June 1994.

Composition of the working group of the Commission for EIA:

mr. W.J. Heijnen;

mr. H. de Iongh;

mr. J.W. Kroon (chairman);

mr. I. van der Putte;

mr. J.H.J. Terwindt.

Technical secretary: mr. R.A.M. Post

APPENDIX 3

List of Publications Used

- NEAP 1993
- Update NEAP 1994
- Environmental profile of Muthurajawela and Negombo Lagoon
- Feasibility report of community development and Kerawalapitiya Sandfill project, April 1993
- BEMO LK 006201/1993 Muthurajawela landaanwinning
- Rapport Evaluatiemissie R.P.A. Rodts, juni 1992
- TOR for EIA Development of Muthurajawela marshes Renawalapitiya reclamation project
- National environmental act No.47 of 1980
- The Gazette of the Democratic Socialist Republic of Sri Lanka 772/22, 24th of June 1993
- Environmental Management Strategy for Colombo Urban Area

APPENDIX 4

Review framework for the EIS

Introduction to this review framework

The main objective of Environmental Impact Assessment is to make available information on environmental impacts of a certain number of relevant solutions for (a) specified problem(s). The availability of this information enables decision makers to make their decision judiciously and balancedly. A description of the legal and institutional setting, in which decisions will be made, defines the place of EIA in the decision making.

To identify solutions to (a) problem(s), the problem(s) must be made explicit, (points of departure) and be analysed (problem analysis). From this analysis, operational objectives for action can be derived. Alternative interventions that respond to these objectives may be identified. One of these interventions may be preferred by the institution that is responsible for solving the problem(s). Actions to mitigate adverse effects must be seen as an integral part of the intervention. As impacts on the environment must be assessed, the existing situation and the expected development without any intervention must be (quantitatively) described. Then, description of the impacts of each alternative enables comparison and sound decision making. All these elements are key elements in the EIA process. Omission of any of these elements compromises the value of EIA for decision making.

The present review framework should be seen as a near to complete checklist of subjects that might have been addressed in the EIS. It lists all EIA-related aspects that might be relevant for decision making. As in the case of Kerawalapitiya Land Reclamation Project some relevant decisions have already been made, some of the points mentioned are of limited relevance. The relevance of each chapter or paragraph is indicated in the first phrase of the chapter (printed in cursive script). The review framework has been used by the Commission to check whether all aspects have been covered in the EIS. Review findings are formulated on headlines, which summarise most of the relevant aspects mentioned in this review framework.

The review framework lists the following EIA elements:

1. points of departure, problem analysis, objectives and decision making;
2. the intended activity, alternatives and accompanying mitigating measures;
3. description of the prevailing condition of the environment and its evolution in case no activity would be undertaken;
4. environmental impact of the intended activity and its alternatives;
5. comparative screening of the intended activity and its alternatives on environmental impact;
6. remaining gaps in knowledge and post-project evaluation;
7. summary.

1 Points of departure, problem analysis, objectives and decision making

As mentioned in the introduction all points in this chapter are key elements in the EIA process and must be addressed in the EIS

- 1.1** The EIS must indicate the points of departure on which the project is based. These points may be formulated as statements that clarify the necessity of intervention. For Muthurajawela marsh they may include aspects of degradation of the environment due to illegal and legal settlement, aspects of public health and wellbeing, overpopulation of the Colombo urban area, public participation, economic and social circumstances (including gender-related issues), (inter)national significance of the wetland and the necessity to conserve it and considerations with regard to the institutional capacities to successfully accomplish interventions in the wider sense (including the Master plan).
- 1.2** The problem analysis would include a clear description of bottlenecks with regard to aspects as described under paragraph 1.1, with special emphasis on environmentally detrimental developments in the project area, public participation, social and economic circumstances, legal facilities and institutional capacities to contain and reverse these developments. The analysis is to attempt to assess the risks of, and possible reasons for failure of the intervention.
- 1.3** The objectives of the intended activity must be formulated explicitly and will be rooted in the problem analysis as described under 1.2. They must cover all aspects of this analysis with exception of those, addressed by other existing or scheduled initiatives. These initiatives are to be described in a separate chapter (see 1.4). Problem analysis and objectives must be formulated independently of the intended activity and in such a way that they may equally apply to all relevant alternative initiatives.
- 1.4** Development programmes and policies limiting or influencing the scope of the objectives might be discussed in the EIS.
- 1.5** The EIS must clearly state the decision in support of which it is written. Moreover it will contain an overview over previous decisions and legal provisions conditioning the actual decision to be made.

2 Intended activity, secondary effects, alternatives, mitigating measures

The points mentioned under this chapter are essential in the EIA-process and must be addressed in the EIS.

- 2.1** The intended activity and the alternatives must lead to a realisation of the objectives formulated.
 - Observes the EIS, in addition to the intended activity, possible alternatives sufficiently? One can think of alternative locations for the establishment of industrial zones and/or settlement of the population, alternatives for the landfill, alternatives for the means of landfilling.
 - To what degree does the intended activity (and its alternatives) contribute to an improvement of the condition of the environment on a short term basis and may it be preventive for structural (long term) improvement of the environment?

2.2 The *intended activity* must be clearly and completely described, particularly those parts influencing the environment. Special attention is to be paid to the institutional setting, in which the activity and the subsequent establishment of residential and industrial zones must be realised and in which facilities and measures to protect the environment on a long term basis must function. Three stages can be distinguished in the realisation of the intended activity:

2.2.1 The preparatory stage (feasibility-study)

Base-line data

Review and assessment of the reliability of available relevant data

- hydrological data (recorded flows, groundwater);
- information concerning beneficial uses and functions of the wetland (irrigation, water supply, fisheries, wildlife);
- data on the demographic situation and trends;
- collection of remaining missing base-line data;
- methods and scope of sensing populations attitudes towards intended initiatives.

Most of these data are contained in the environmental profile.

Long term planning

- description of the overall long term planning for the area and review of this planning on national policies (NEAP) and international guidelines. Long term preview of effects of scheduled industrial and residential developments on development of the wetland, its hydrological functions and its ecosystems.

Institutional aspects and sustainability

- description and appreciation of the institutional framework in which realisation of the landfill, establishment and management of industrial and residential zones and management of the wetlands will take place;
- public acceptance, involvement and participation.

2.2.2 The stage of landfilling and establishment of the project infrastructure

Technical data on the initiative

The Borrow site and the dredging activities

- description of the method of selection of the borrow site. Justification of its location, (the environmental profile and the feasibility study make mention of a borrow site at 5 km distance from the shoreline);
- description of techniques to be used to withdraw, transport and deliver the required material;
- description of the required equipment;
- security arrangements;
- design-related mitigating measures to avoid environmental damage under normal functioning of the equipment and in case of calamities;
- facilities for employees (safety, health);
- mitigating measures (prevention and repair of erosion, disturbance of the borrow site(s) or environmental damage caused by construction activities).

The landfill site

- description of the method of selection of the landfill site. Justification of its location and extension;
- justification of the quantity of fill material needed;
- detailed description of the procedure of land filling;
- detailed description of the fill site at delivery;
- mitigating measures to avoid salt intrusion in the marsh by means of superficial and/or subterranean transport;
- mitigating measures to avoid disturbances of the marsh and lagoon ecosystems;
- resettlement program of inhabitants.

2.2.3 The stage of evaluation of performance

- has a long term monitoring and evaluation plan been foreseen?

2.3 Have all eventual secondary effects of the initiative and its alternatives been identified and described (including measures to prevent or diminish environmental damage thereof)?

2.4 Have all relevant alternatives been identified and described (according to the aspects mentioned under 2.2)?

2.5 Does the EIS describe the alternative most friendly to the environment for the various parts of the alternative? Does the EIS describe the no action alternative?

2.6 Do mitigating measures (measures to prevent or diminish environmental damage) form an integral part of the description of the intended activity and its alternatives?

3 Description of the prevailing environmental conditions and its evolution in case no activity would be undertaken

As no alternatives for the landfill have been described in the present EIS, description of these points can be limited to the intended activity

3.1 The prevailing condition of the environment is described in order to facilitate forecasting of:

- the environmental impact of the intended activity and its alternatives;
- the autonomous development of the environment in case the intended activity nor its alternatives are implemented.

As a consequence the description of the prevailing condition of the environment can be limited to those aspects that will be subject to change as a result of implementation of the intended activity or its alternatives.

The description of the autonomous development of the environment serves as reference for the comparison of the environmental impact of the intended activity and its alternatives. It also identifies future environmental bottlenecks in case no action is undertaken and thus provides clues on whether the 'no action' alternative can be observed as realistic.

3.2 The location and extent of the study area, for which the EIS was established must be clearly delimited and motivated. It may vary per type of environmental effect.

- 3.3** The following aspects may be relevant in the description of the prevailing situation and the autonomous development of the environment in the study area:

Borrow site

Abiotic aspects

- geological, geomorphological, edaphical, geo-hydrological, hydrological and hydrographic situation and the development thereof;
- location, nature, texture, and characteristics of the material to be used for filling;
- actual use and functions of the borrow area.

Biotic aspects

- ecosystems and habitats.

Other aspects

- archaeological and cultural objects;
- presence of nature reserves.

Land fill site

Population

- demographic data like actual population and population growth;
- source of income and dependence on natural resources as far as they might be affected by the intended activity or its alternatives. (agriculture, silviculture, fisheries, hunting, trade, transport, recreation). This is important to evaluate possible economic impacts;
- the socio-economic situation of the population and their perception of the sanitary conditions in which they live. Assessment of the financial capacity and willingness to pay for, or accept improvement of these conditions.

Health

- the actual state of health of various groups of the population is to be analysed and related to basic health, availability and quality of drinking water, sanitary and housing facilities.

Physical aspects

- geological, geo-hydrological and hydrological situation and development;
- soils;
- land and water quality and use.

Biotic aspects

- marine, lagoon, marsh and adjacent land ecosystems, population data for fish, other animal and plant species.

Culture

- valuable cultural objects.

Nature reserves

- possible presence of nature reserves in the study area.

4 Environmental impact of the intended activity and its alternatives

As no alternatives for the landfill have been described in the present EIS, description of these points can be limited to the intended activity. Impacts of executional variants, however, must be described as well.

4.1 Impacts are to be described for the intended activity *and its alternatives*.

4.2 Both positive (orderly establishment of industrial and residential zones facilitating containment of pollution) of and negative effects (increased risk of occurrence of environmental effects and calamities by the landfill activity itself and by industry and population) must be described.

4.3 Research methods and their limitations are to be discussed.

4.4 The following aspects are to be observed in describing the impact of the intended activity and its alternatives:

Borrow site (if offshore)

- effects on offshore geological and geomorphological patterns;
- effects on stream patterns and coastal line;
- effects on marine ecosystem and species;
- effects on water quality;
- emissions, noise and nuisance;
- risk of calamities.

Landfill site and borrow site (if on mainland)

Population

- temporal or permanent decline or increase of the sources of income for (parts of) the population in the study area;
- changes in agricultural, piscicultural or other economy related potential; possible effects on population figures by increased attractiveness by improved living conditions;
- opinion of the local communities involved in relation to the intended activity and the alternatives;
- degree of involvement/participation of local communities and effects on communal identity and organisation;
- disturbance of hydrological and geo-hydrological systems and their functions, changes in water quantity, quality and composition;
- environmental effects and risks of superposing a layer of fill materials on a peat layer;
- effects of the decrease of the surface of the wetland on ecosystems and species.

Health

- change of sanitary conditions and effects on public health.

Risks and security

- legal aspects concerning land ownership;
- risk of occurrence of malfunction of the institutional framework in which management of the landfill, the wetland and the adjacent residential areas will take place and environmental effects hereof;
- risk of occurrence of financing deficits and its environmental effects;
- risks of use of reclaimed areas (industrial/residential pollution pressure on the wetland);
- risks and effects of floods on industrial/residential pollution in the wetland;
- risk and effects of indifference of the population in relation to the functioning of the proposed infrastructure;
- risks of the technology used for filling.

Soils and land

- effects on land use;
- effects on valuable landscapes, religious, archaeological and cultural values.

5 Comparative screening of the intended activity and its alternatives on environmental impact

As in the present EIS no alternatives have been described and no variants have been fully worked out, the points in this chapter are of limited relevance for this review.

- 5.1** The *alternatives must be compared per type of impact*. The autonomous development of the environment as described under chapter three may serve here as situation of reference.
- 5.2** The EIS must indicate *to which extent each of the observed alternatives achieves the objectives formulated*.
- 5.3** The *comparison* of the alternatives on environmental impact *and on achievement of objectives* will lead to an order of preference per impact. Combination of these orders will culminate in formulation of the '*preferred alternative*', which may differ from the intended activity due to the process of EIA.

6 Remaining gaps in knowledge and post-project evaluation

In order to evaluate and value the relevance of the information presented and lacking in the EIS the following points are of importance

- 6.1** The EIS must include an overview of *remaining gaps in knowledge* and their significance for the intended activity. Uncertainties with respect to environmental impacts are part of this overview.
- 6.2** The EIS must schedule an *evaluation programme* including:
- a research programme filling remaining gaps in knowledge as far as relevant for the implementation of the intended activity;
 - a monitoring programme, evaluating actually emerging impacts on the environment and the effectiveness of mitigating measures implemented.

7 Summary

As the public has been extensively involved in the EIA and preceding processes it is important to present a concise summary, written in diction accesible to the general public.

The Summary is to present the main elements of the EIS.

APPENDIX 5

Missing Studies

- Hydrographic study of borrow site and mooring site
- Study assessing the protective function of the reef
- Study assessing the effects of the removal of sand from the borrow site
- Study assessing the mobility of turbidity plumes
- Study assessing the effects of turbidity on marine, flora and fauna
- Hydrologic study assessing the effects of the landfill on flooding frequency, on concentrations of salt, nutrients and pollutants in the marsh and the lagoon
- Survey of existing levels of fishing activities
- Survey of marine fauna and flora
- Survey of the locations and seasonality of spawning areas and the seasonality of other biologic resources

APPENDIX 6

Elements for an Operational Safety Plan

Elements to be included in an operational safety and healthy working conditions plan are amongst others:

- All workers need training on health and safety issues
- Equipment/machinery must meet safety requirements
- The area which is being "filled" are to be marked and no unauthorized persons must be allowed to enter the marked area
- All persons who carry out any activities in the marked area are to be provided with at least boots and safety helmets
- Ear plugs would be available for all machine operators and for labourers who carry out (manual) work near noise producing machines
- All moving parts in the booster station must be covered
- Welders must be provided with adequate protective clothes and other protective aids (eye-shield, gloves et cetera)