

SCOPE OF WORK
FOR
THE STUDY
ON
STORM WATER DRAINAGE PLAN
FOR THE COLOMBO METROPOLITAN REGION
IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

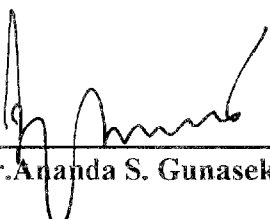
AGREED UPON BETWEEN

SRI LANKA LAND RECLAMATION & DEVELOPMENT CORPORATION
UNDER THE MINISTRY OF URBAN DEVELOPMENT
CONSTRUCTION & PUBLIC UTILITIES

AND

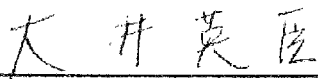
JAPAN INTERNATIONAL COOPERATION AGENCY

Colombo, March 7, 2001



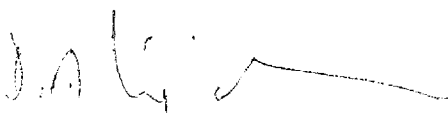
Mr. Ananda S. Gunasekera

SECRETARY
MINISTRY OF URBAN DEVELOPMENT
CONSTRUCTION & PUBLIC UTILITIES



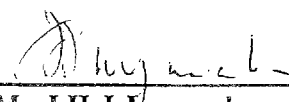
Mr. Hidetomi Oi

LEADER
PREPARATORY STUDY TEAM
JAPAN INTERNATIONAL COOPERATION
AGENCY (JICA)



Mr. Dileepa Wijesundera

CHAIRMAN
SRI LANKA LAND RECLAMATION &
DEVELOPMENT CORPORATION



Mr. J.H.J. Jayamaha

DIRECTOR
DEPARTMENT OF EXTERNAL
RESOURCES
MINISTRY OF FINANCE & PLANNING

I. INTRODUCTION

In response to the request of the Government of the Democratic Socialist Republic of Sri Lanka, the Government of Japan has decided to conduct the Study on Storm Water Drainage Plan for the Colombo Metropolitan Region in the Democratic Socialist Republic of Sri Lanka (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of the Democratic Socialist Republic of Sri Lanka. This document sets forth the scope of work with regard to the Study .

II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. To formulate the master plan of Storm Water Drainage Plan for the Colombo Metropolitan Region and to conduct feasibility study on priority projects identified in the master plan, and
2. To carry out the technology transfer to counterpart personnel in the course of the Study.

III. STUDY AREA

The study area shall cover the part of Colombo Metropolitan Region as shown in Annex 1.

IV. SCOPE OF THE STUDY

Phase 1: Formulation of the Master Plan

[Basic Study]

1. Collection and review of related data and information
 - (1) natural conditions, including meteorological, hydrological and geological data, and topographic map
 - (2) social and economic conditions(including sanitation)
 - (3) environmental conditions(water quality, waste water collecting and treatment system, vegetation and animals, etc.)
 - (4) history of flood damage
 - (5) national, regional and urban development plans
 - (6) laws, regulations, policies and customary practices
 - (7) existing drainage, sewerage and water supply facilities
 - (8) institutions, organizations, administration and their function
 - (9) social and economic infrastructures
 - (10) land use
 - (11) on-going / planned projects and plans
 - (12) other relevant data and information
2. Review of studies and plans relevant to the study
3. Field reconnaissance and field survey, as required
 - (1) hydrological, topographical and geological conditions
 - (2) existing drainage facilities including outlets to the sea and rivers
 - (3) water quality
 - (4) land use
 - (5) inundation condition and damages
 - (6) environmental conditions
4. Analysis and examination of the result of basic study

[Formulation of the Master Plan]

1. Hydraulic and hydrological study
2. Confirmation of planning framework
 - (1) socio-economic framework, including population increase and housing requirement
 - (2) design storm water flow
 - (3) planning area
3. Formulation of the Master Plan
 - (1) Identification of retention/detention and filling areas
 - (2) Establishment of alternatives and selection of the optimum plans
 - (3) Preliminary design of facilities
 - (4) Non-structural measures
 - (5) Operation and maintenance plan
 - (6) Institutional development plan including review of regulation
 - (7) Cost estimation and financial plan
4. Initial Environmental Examination(IEE)
5. Evaluation of the Master Plan
 - (1) economic evaluation
 - (2) social evaluation
 - (3) technical evaluation
 - (4) financial evaluation
6. Selection of priority projects

Phase2:Feasibility Study on the Priority project(s)

1. Supplemental data collection and analysis
2. Supplemental field survey
3. Confirmation of planning framework
4. Formulation of plans for the priority project(s)
 - (1) Identification of retention/detention and filling areas
 - (2) Design of facility(ies)
 - (3) Non-structural measure(s)
 - (4) Operation and maintenance plan
 - (5) Institutional development plan
 - (6) Cost estimation and financial plan
5. Environmental Impact Assessment(ELA)
6. Project evaluation
 - (1) economic evaluation
 - (2) social evaluation
 - (3) technical evaluation
 - (4) financial evaluation
7. Formulation of implementation plan
8. Recommendation

V. STUDY SCHEDULE

The Study shall be carried out in accordance with the attached schedule(provisioned) for approximately seventeen(17) months (Refer to Annex 2).

VI. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Sri Lanka.

1. Inception Report (IC/R)
Thirty (30) copies of IC/R at the commencement of the Study.
2. Progress Report(1)(PR/R(1))
Thirty (30) copies at the end of the first field survey
3. Interim Report (IT/R)
Thirty (30) copies at the end of phase 1. This report shall contain the results of the phase 1 survey and outline of phase 2 study program.
4. Progress Report(2)(PR/R(2))
Thirty (30) copies at the end of the second field survey
5. Draft Final Report (DF/R)
Thirty (30) copies at the end of the third field survey. Sri Lanka side shall comment on the report within one (1) month after the receipt of the report.
6. Final Report (F/R)
Final Report shall be prepared incorporating the comments from Sri Lanka side and sixty(60) copies shall be submitted within one (1) month after the receipt of the comments.

VII. UNDERTAKING OF THE GOVERNMENT OF THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

1. To facilitate smooth conduct of the Study, Sri Lanka side shall take the following measures.
 - (1) To secure the safety of the Japanese Study Team (hereinafter referred to as "the Team");
 - (2) To permit the members of the Team to enter, leave and sojourn in the Sri Lanka for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees;
 - (3) To exempt the members of the Team from taxes, duties and other charges on equipment, machinery, and other materials brought into and out of Sri Lanka for the conduct of the Study;
 - (4) To exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowance paid to the member of the Team for their services in connection with the implementation of the Study;
 - (5) To provide necessary facilities to the Team for the remittance as well as utilization of the funds introduced into Sri Lanka from Japan in connection with the implementation of the Study;
 - (6) To secure permission for entry into private properties or restricted areas for the conduct of the Study after having necessary consent from the concerned authorities and individuals;
 - (7) To secure permission for the Team to take all data and documents (including maps and photographs) related to the Study out of Sri Lanka to Japan as per the Sri Lanka law; and
 - (8) To provide medical services as needed. However, those expenses will be chargeable to the member of the Team.

2. Sri Lanka side shall bear claims, if any arises against the members of the Team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.
3. SLLRDC shall act as the counterpart agency to the Team and also as a coordinating body in relations with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.
4. Sri Lanka side shall, at its own expense, provide the Team with the following in cooperation with other organizations concerned:
 - (1) Available data and information related to the Study,
 - (2) Counterpart personnel,
 - (3) Suitable office space with necessary equipment, and
 - (4) Credentials and identification cards.

VIII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

- (1) To dispatch, at its own expense, the Team to Sri Lanka; and
- (2) To pursue technology transfer to the Sri Lanka counterpart personnel in the course of the Study.

IX. CONSULTATION

Sri Lanka side and JICA shall consult with each other in respect of any matters that may arise from or in connection with the Study.

DANDUGAM OYA

Annex 1 : PROJECT AREA

COLOMBO

INDIAN OCEAN

BOLGODA LAKE

JICA



(大井)

h

7
2

Annex 2

| work | month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|----------|-------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|-----|----|
| | | | | | | | | | | | | | | | | | | |
| schedule | | <div style="border: 1px solid black; height: 20px; width: 100%;"></div> | | | | | | | | | | | | | | | | |
| report | | | | | | | | | | | | | | | | | | |
| | | ▲ | | | | | | | | | | | | | | | ▲ | |
| | | IC/R | | | | | | | | | | | | | | | F/R | |

IC/R : Inception Report

F/R : Final report

(K#)

f
d

MINUTES OF MEETINGS
ON
SCOPE OF WORK
FOR
THE STUDY ON STORM WATER DRAINAGE PLAN
FOR THE COLOMBO METROPOLITAN REGION
IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

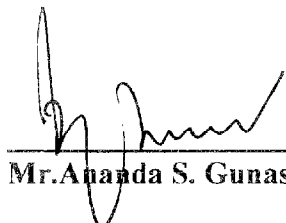
AGREED UPON BETWEEN

SRI LANKA LAND RECLAMATION & DEVELOPMENT CORPORATION
UNDER THE MINISTRY OF URBAN DEVELOPMENT
CONSTRUCTION & PUBLIC UTILITIES

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

Colombo, March 7, 2001



Mr. Ananda S. Gunasekera

SECRETARY
MINISTRY OF URBAN DEVELOPMENT
CONSTRUCTION & PUBLIC UTILITIES



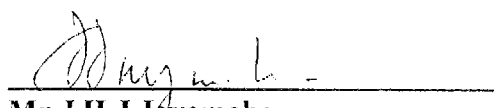
Mr. Hidetomi Oi

LEADER
PREPARATORY STUDY TEAM
JAPAN INTERNATIONAL COOPERATION
AGENCY (JICA)



Mr. Dileepa Wijesundera

CHAIRMAN
SRI LANKA LAND RECLAMATION &
DEVELOPMENT CORPORATION



Mr. J.H.J. Jayamaha

DIRECTOR
DEPARTMENT OF EXTERNAL
RESOURCES
MINISTRY OF FINANCE & PLANNING

The Japan International Cooperation Agency(JICA)dispatched the Preparatory Study Team to Sri Lanka from March 1 to March 7, 2001 to discuss and agree with the Scope of Work (S/W) for "The Study on Storm Water Drainage Plan for the Colombo Metropolitan Region in the Democratic Socialist Republic of Sri Lanka" .

The Team carried out field surveys of the study area, and held a series of discussions with Sri Lanka Land Reclamation & Development Corporation (hereinafter referred to as "SLLRDC") and other authorities concerned.

The Minutes of Meetings summarize the result of discussions held between the JICA Preparatory Study Team and the concerned agencies of the Government of Sri Lanka. The list of attendants is attached in the Appendix.

1. The Study Title

Both sides agreed that the Study title should be "THE STUDY ON STORM WATER DRAINAGE PLAN FOR THE COLOMBO METROPOLITAN REGION IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA."

2. Scope of Work

Both sides agreed on the Scope of Work for the Study with some amendments made to the draft of the Scope of Work presented by the Preparatory Study Team

3. The Counterpart Personnel

Both sides agreed that SLLRDC would organize a counterpart team which would cooperate with the Study Team. The members of the counterpart team would be nominated in advance of the commencement of the Study. It is preferable for the counterpart team to include personnel in charge of institutions and public relations as well as technical planning and designs.

4. The Steering Committee

Sri Lanka side will set up the Steering Committee for the smooth implementation of the Study. The members of the Committee would be comprised of representatives of concerned agencies and should be nominated in advance of the commencement of the Study. The chairman may invite representatives from other relevant ministries, departments and agencies, whenever necessary. Sri Lanka side proposes that the concurrence of the Committee should be obtained at each stage of the Study described under item VI-Reports of the Scope of Work.

5. Seminars/Workshops

Sri Lanka side requested that seminars/workshops should be held for the technology transfer and public awareness in the course of the Study at least three times at the beginning, the middle and the end of the Study. The Team recognized the necessity and promised to convey the request to JICA Headquarters for consideration.

6. Counterpart Training

Sri Lanka side requested to conduct the counterpart training in Japan for a smoother technology transfer during the Study. The team promised to convey this request to the JICA Headquarters for consideration.

7. Undertaking of Sri Lanka side

- (1) In reference to VII 1 (1) of the Scope of Work, Sri Lanka side shall inform the Study Team of the security conditions of the study area and shall take necessary measures to secure the safety of the Study Team especially during field works.
- (2) In reference to VII 1 (6) of the Scope of Work, Sri Lanka side shall take necessary measures so that the permission regarding the entry into private properties or restricted areas shall be obtained from the concerned authorities and individuals without delay.
- (3) In reference to VII 1 (7) of the Scope of Work, the permission regarding data and documents should be obtained from concerned authorities as early as possible so that the Study Team may use such materials especially maps and aerial photos from the beginning of the Study.
- (4) In reference to VII 4 (3) of the Scope of Work, SLLRDC agreed to provide an office with a suitable space. However, SLLRDC mentioned that it would be difficult to provide facsimile machine, copy machine, vehicle(s) and computers and requested JICA to provide these equipment. The Team promised to convey this request to JICA Headquarters.

Handwritten signature and initials, including a circled mark containing the characters "大井" (Ōi).

APPENDIX

LIST OF ATTENDANTS

(Sri Lanka side)

Sri Lanka Land Reclamation & Development Corporation(SLLRDC)

| | |
|---------------------|------------------------|
| Dileepa Wijesundera | Chairman |
| D.T. Talagala | General Manager |
| Keerthi Jayawardena | Deputy General Manager |
| K.M.M.N Retnegrice | Engineer |

Ministry of Urban Development Construction & Public Utilities(MUDC & PU)

| | |
|----------------------|--------------------------|
| Ananda S. Gunasekera | Secretary |
| L. W. Jirasingha | Additional Secretary |
| M.W. Dayananda | Director of Construction |
| M.I.A. Latiff | DD/WS |
| T.R.J. Fernando | DD(C) |

Department of External Resources

| | |
|-----------------|----------|
| J.H.J. Jayamaha | Director |
|-----------------|----------|

Urban Development Authority(UDA)

| | |
|-----------------|------------------|
| W.A.Siriwardena | Director General |
|-----------------|------------------|

Municipal Council(MC)officials

| | | |
|---------------------|-------------------------|--------------------------|
| L.H.M. Dayananden | Municipality | Engineer |
| H.N.P. Wanigasekera | Sri Jayawarnapura | |
| | Kotte Municipal Council | Chief Municipal Engineer |

(Japanese side)

Preparatory Study Team

| | |
|------------------|---------------------------|
| Hidetomi Oi | Team Leader |
| Satoru Otani | Drainage Improvement Plan |
| Yasutaka Kageta | Study Planning |
| Takuro Terashima | Drainage Planning |
| Toshiro Iwahashi | Hydraulics/Hydrology |

Embassy of Japan

| | |
|---------------|------------------|
| Kenji Seiyama | Second Secretary |
|---------------|------------------|

Japan Bank for International Cooperation

| | |
|------------|----------------------|
| Naomi Miwa | Chief Representative |
| Kei Toyama | Representative |

JICA Sri Lanka Office

| | |
|-----------------|-----------------------------------|
| Seiji Kaiho | Resident Representative |
| Hiroyuki Tanaka | Assistant Resident Representative |

Y: Available, N: Not Available

| No | Item | Availability (Y or N) | Data Source | Name of Data |
|-----|---|--------------------------|------------------------------------|--------------|
| 1 | CLIMATIC AND HYDROLOGICAL INFORMATION | | | |
| 1.1 | Location map of climatological and hydrological observatories | | | |
| | a. Climatological and rainfall stations | Yes | See collected data and information | |
| | b. Hydrological gauging stations (water level and discharge) | Yes | See collected data and information | |
| 1.2 | List of aforementioned stations showing | | | |
| | a. Station name | Yes | See collected data and information | |
| | b. Location/address | Yes | See collected data and information | |
| | c. Classification of observatory or code No., if any | N/A | | |
| | d. Observation items indicating equipment in use | Yes | See collected data and information | |
| | e. Period of observation | Yes | See collected data and information | |
| | f. Authorities concerned | Yes | See collected data and information | |
| 1.3 | General climatic conditions in the Study Area | | | |
| | a. Monthly average at major climatological stations | Yes | See collected data and information | |
| 1.4 | Rainfall data in the Region | | | |
| | a. Monthly average rainfall at major stations | Yes | See collected data and information | |
| | b. Daily rainfall at major stations | Yes | See collected data and information | |
| 1.5 | Water level and discharge data | | | |
| | a. Monthly average and daily water levels/discharges, if any | No | | |
| | b. Equation and/or curve showing relationship between water level and discharge | No | | |
| | c. Sediment observation record (bed load and suspensions load) | No | | |
| 1.6 | Relevant previous hydrological study reports | | | |
| | a. study by Nippon Koei | Yes | See collected data and information | |
| | b. study by WS Atkins International | Yes | See collected data and information | |
| | c. Others, if any | Yes | See collected data and information | |

Y: Available, N: Not Available

| No | Item | Availability (Y or N) | Data Source | Name of Data |
|-----|--|--------------------------|------------------------------------|--------------|
| 1.7 | Map showing catchment basin (or drainage basin) in and around the Study Area | Yes | See collected data and information | |
| 4 | ENVIRONMENT | | | |
| 4.1 | Organization | | | |
| (1) | Latest organization for environmental protection for the Study Area (government, donors, NGOs and private companies) | Yes | See collected data and information | |
| | a. Organization chart | No | | |
| | b. Role and responsibility of each organization | No | | |
| 4.2 | Environmental impact assessment (EIA) | | | |
| (1) | Law and regulations regarding EIA | Yes | See collected data and information | |
| (2) | Technical guideline for EIA | N/A | | |
| (3) | Environmental quality standard | N/A | | |
| (4) | Information and study reports of the projects which would affect environmental aspect | N/A | | |
| (5) | Previous reports of relevant environmental assessment and monitoring | | | |
| | a. Initial Environmental Examination (IEE) | Yes | See collected data and information | |
| | b. Environmental Impact Assessment (EIA) | Yes | See collected data and information | |
| (6) | Environmental distribution maps for the Study Area | | | |
| | a. Environmental vulnerable areas | N/A | | |
| 5 | LOCAL CONSULTANTS AND UNIT PRICES | | | |

Y: Available, N: Not Available

| No | Item | Availability (Y or N) | Data Source | Name of Data |
|-----|--|--------------------------|------------------------------------|--------------|
| 5.1 | Consultants and survey companies | | | |
| | List of consultants and survey companies which are capable for conducting works together with JICA full-scale study team | Yes | See collected data and information | |
| | (Name, representatives, telephone and facsimile number, e-mail, address, number of engineer, holding equipment, capital and relevant previous results) | | | |
| | a. Installation of rainfall gauging stations | Yes | See collected data and information | |
| | b. Installation of water level gauging stations on rivers and irrigation channels | Yes | See collected data and information | |
| | c. Installation of groundwater level gauging stations | Yes | See collected data and information | |
| | d. Hydrological observation (rainfall, river flow and groundwater level) | Yes | See collected data and information | |
| | e. Environmental Impact Assessment (EIA) | Yes | See collected data and information | |
| 5.2 | Unit prices | | | |
| | Unit prices and wages of local consultants and surveyors (per month) | Yes | See collected data and information | |
| | (senior engineer, engineer, assistant engineer, secretary, typist, CAD operator, driver and workers) | | | |

5. 主要面会者リスト

別紙 3

主要面談者リスト

(Sri Lanka side)

Sri Lanka Land Reclamation & Development Corporation(SLLRDC)

| | |
|---------------------|------------------------|
| Dileepa Wijesundera | Chairman |
| D.T. Talagala | General Manager |
| Keerthi Jayawardena | Deputy General Manager |
| K.M.M.N Retnegrice | Engineer |

Ministry of Urban Development Construction & Public Utilities(MUDC & PU)

| | |
|----------------------|--------------------------|
| Ananda S. Gunasekera | Secretary |
| L. W. Jirasingha | Additional Secretary |
| M.W. Dayananda | Director of Construction |
| M.I.A. Latiff | DD/WS |
| T.R.J. Fernando | DD(C) |

Department of External Resources

| | |
|-----------------|----------|
| J.H.J. Jayamaha | Director |
|-----------------|----------|

Urban Development Authority(UDA)

| | |
|-----------------|------------------|
| W.A.Siriwardena | Director General |
|-----------------|------------------|

Municipal Council(MC)officials

| | |
|---------------------|---|
| L.H.M. Dayananden | Municipality Engineer |
| H.N.P. Wanigasekera | Sri Jayawarnapura Kotte Municipal Council Chief Municipal Engineer |

(Japanese side)

Preparatory Study Team

| | |
|------------------|---------------------------|
| Hidetomi Oi | Team Leader |
| Satoru Otani | Drainage Improvement Plan |
| Yasutaka Kageta | Study Planning |
| Takuro Terashima | Drainage Planning |
| Toshiro Iwahashi | Hydraulics/Hydrology |

Embassy of Japan

| | |
|---------------|------------------|
| Kenji Seiyama | Second Secretary |
|---------------|------------------|

Japan Bank for International Cooperation

| | |
|------------|----------------------|
| Naomi Miwa | Chief Representative |
| Kei Toyama | Representative |

JICA Sri Lanka Office

| | |
|-----------------|-----------------------------------|
| Seiji Kaiho | Resident Representative |
| Hiroyuki Tanaka | Assistant Resident Representative |

JOCV Sri Lanka

| |
|-------------|
| Mrs.Imasato |
| Mr.Ikeda |