Section 7. Terms of Reference

Consultancy Services for Planning, Detailed Design and Procurement of Environment Management Services Component for Trincomalee, Dambulla, Kurunagela and Ratnapura cities in Sri Lanka

(Package No. SUDP DPC EP 01)

1. Background:

1) The Ministry of Megapolis and Western Development (MMWD), Government of Sri Lanka (GoSL) is planning to take up sustainable development initiatives in key strategic cities of the country with growth potential outside Colombo, which include Trincomalee, Dambulla and Kurunagela cities in Colombo - Trincomalee economic corridor and another important nodal city i.e Ratnapura which is a main commercial city of Sabaragamuwa Province. The location map of these cities is given vide Annexure 1. In this endeavor, Government of Sri Lanka and Asian Development Bank (ADB) have agreed to work together for the sustainable urban development project.

2) In order to ensure project readiness before approval of the main loan, ADB has agreed to provide an Urban Project Preparatory Facility (UPPF) through a Technical Assistance (TA) Loan for Sri Lanka which is envisaged to strengthen project readiness by completing advanced studies, feasibility analysis, detailed designs, and procurement actions meeting ADB financing requirements, and building capacities of implementing agencies in the urban sector prior to main project approval.

3) Environmental Management is one of the components taken up under this Project which basically includes (i) establishment of a sustainable Solid Waste Management Mechanism; (ii) Improvements to Urban Storm Water Drainage and develop a management system and initiatives for flood mitigation; (iii) Waste Water and sewerage management components (relevant to the above (i) and (ii) component).

4) This consultancy assignment is planned to be financed through the TA Loan mentioned above.

2. Objective(s) of the Assignment:

5) The main objectives of the assignment are to:

(i) Update the present status of the service sector(s) with regard to Storm Water Drainage and Solid Waste Management in the above 4 cities for baseline information ;
(ii) Prepare a city based Solid Waste Management strategy for the four cities and prioritize the investments to be taken up under the Project;

(iii) Prepare Master Plans for Storm Water Drainage Management for the four cities and prioritize the investments to be taken up under the Project;
(iv) Take up necessary allied works such as surveys and investigations required to design and implement the subprojects identified;
(v) Prepare feasibility reports, detailed designs, drawings and cost estimates for implementation of priority subprojects to be taken up under Solid Waste Management component and Strom water Drainage management and flood mitigation interventions based on the recommendations of the Master Plans prepared for these sectors, to the extent of availability of funds under the Project. The reports on measures on environmental and social safeguards (resettlement requirements / indigenous people issues if any) need to be prepared. The climate change factors should be considered in the designs.
(vi) Prepare detailed project reports for all the subprojects identified.
(vii) Work out the technical, financial, economic, environmental and social feasibility of each package;
(viii) Assist in the procurement of works and goods (mainly includes preparation of bid documents, procurement plan, assisting in bid evaluation until award of works.); and
(ix) Assist the implementing agencies in project readiness activities for commencement of construction work.

3. Scope of Services, Tasks (Components) and Expected Deliverables

3.1 General Scope of Services:

6) The scope of work mainly but not limited to include services for Kurunegala, Dambulla, Trincomalee and Ratnapura cities.(in case of Rathnapura both the Ratnapura New city and old city shall be considered)

7) The Sector-wise Terms of Reference which indicates the main activities are provided in Annexure 2 to this TOR.

8) The main sectors covered under this component are:

(a) Solid Waste Management in all four cities;
(b) Improvements to Urban Drainage system and flood mitigation measures in four cities.
(c) Improvements to waste water and sewerage systems to cover the requirements of completeness of other subprojects (if any) and as initiatives to preserve the natural water bodies and groundwater resources etc.

9) Detailed Master Plan for next 30 years Horizon shall be prepared for both (i) Solid Waste Management; and (ii) City wise Storm Water Drainage management; in accordance to the National regulatory framework. The Master Plans should clearly identify and list the prioritized development initiatives and timeline of implementation with proper phasing of works with the first phase works to be taken up with the funds available under the project.

10) A tentative total investment package for the environmental management component would be around US $ 76 million for all four cities (Kurunegala US$ 18 million, Dambulla US$ 24 million, Trincomalee US$ 16 million and Rathnapura US$ 16 million) based on the priorities identified. The Master Plans and the studies should be followed up with prioritization of works based on the feasibility and availability of funds as mentioned above.

11) The Consultant is required to carry out feasibility studies for the identified priority sub-projects. Subproject feasibility should include technical, financial and economic analysis. Social and environmental risk analysis report shall be prepared for the subprojects. Social and environmental safeguard documents shall be prepared for the feasible priority investments in compliance with ADB safeguard policies. The consultant also needs to prepare Detailed Project Reports including engineering designs, environmental and social safeguard reports and financial /economic feasibility reports and also prepare bidding documents for the project in compliance with ADB's procurement guidelines. Finalization of the list of sub projects shall be based on extensive consultations with the project steering committees, working committees, other relevant stakeholders and approval of respective city councils and asset owners.

12) The overall design would cater for a period of around 30 years horizon or as defined as per national planning norms and a projected population as determined by the consultant based on appropriate projection techniques. The designs shall conform to relevant/ latest applicable National Legislative Frameworks. Wherever such guidelines are not available, appropriate guidelines shall be followed in discussion with the client.

13) The designs should take into consideration the climate change factors.

14) The Master Plan and the designs should be finalized after a detailed consultation with all the relevant stakeholders.

15) The consultant needs to collect and update information regarding service levels of the sector taken up for development in the study area including inventory of existing systems before commencement of master plan and designs.

16) The consultant needs to collect related data for the study and for the purpose of engineering designs. The secondary data shall be collected and validated by the consultant. The consultant shall responsible for all the details provided in their reports on physical and site conditions, the execution methodology, and various other parameters etc. All data utilized in preparation of the reports shall be presented indicating the sources of the data and also the basis of assumptions, if any. i.e the design consultant shall be responsible for all the data or designs and drawings given by them.

17) The consultant shall carry out allied works such as topographical surveys, necessary geotechnical investigations etc. (any out sourcing by the consultant should follow the standard procurement process). The local body will provide the information on sub-project sites, their measurements and ownership details. The consultant shall be responsible for its verification and mapping. Soil tests as per relevant National Standards have to be conducted and necessary reports prepared by consultants to arrive at design parameters and submit the test reports.

18) The Consultant shall be use the latest versions of software packages in order to carryout data analysis, hydraulic modeling and any other relevant data analysis tools enabling to develop scenarios, models and designs to be presented to the client and the project stakeholders for the acceptance of the proposals.

19) The detailed cost estimates need to be prepared using the latest schedule of rates of the Province. Estimate associated costs such as road restoration charges/ shifting of utilities, resettlement etc. There should not be any lumpsum items in the bill of quantities. For items not covered under schedule of rates, market rates to be assessed. (Necessary documents on quotations received should be made for assessment of market rates) and also prepare contract packaging plan.

20) For the given purpose and functional use of the respective sub-projects, proper design has to be developed. The consultants have freedom to choose the type of sub structure and superstructure, provided National code specifications and standards are met. The drawings and designs shall include a general arrangement drawing and a detailed longitudinal section drawing of all components in size A1 or A2. The level of detailing shall be such so as to enable check of conformance with code provisions, including detailed construction drawings and bar bending schedules. The responsibility of the preparation and issue of detailed construction drawings is that of the Design Consultants which needs to be submitted along with the bid documents. All the reports produced under the allied studies such as soil investigations, stability reports, surveys reports etc., shall be submitted along with the detailed designs.

21) The consultant shall prepare the TOR for procuring a Supervision Consultant for the works packages which will be identified for the implementation under the project.

22) Assist completely in bidding, bid evaluation and award process in procurement of works, goods and materials in accordance to guidelines of ADB as required by the client.

23) The consultant needs to prepare project Implementation schedule and budget with cash flow forecasts, furnish network analysis such as Critical Path Matrix/ *Program Evaluation and Review Technique* (CPM / PERT) for purposes of effective project monitoring and regular reports.

24) The consultant needs to carry out social impact assessments of proposed development including land acquisition and its financial implication, and if found necessary, prepare a Resettlement Action Plan and/or an indigenous people plan in accordance with the resettlement Policy framework (RPF) and indigenous peoples planning framework (IPPF) agreed upon between the Government of Sri Lanka and ADB. In case there are no social / resettlement issues the consultant is required to prepare a Due Diligence Report (DDR) for social safeguards.

25) GRM: consultants will also provide capacity building support to executing and implementing agencies ensure: (i) grievance redress mechanisms can function effectively; and (ii) improved project communication skills of the implementing and executing agencies so that affected persons are well informed thus reducing the number of grievances arising due to the ensuing projects.

26) The Consultant needs to prepare necessary environmental assessment reports in compliance with the environmental assessment and review framework (EARF) agreed upon between the government and ADB and requirements of ADB procedures. Impacts shall be categorized as per the National Policy Framework and ADB Safeguard Policy Statement (SPS) if the sub projects are belongs to prescribed project category, the Consultant shall prepare the assessment reports in order to submit the same for obtaining TOR from the CEA for further assessments as per the recommendations by the CEA. In case there are no significant environmental impacts, the consultant is required to prepare the Due Diligence Reports for Environmental Safeguards. If it is the case the Consultant shall prepare Environmental Management Plans (EMP) for works packages separately.

27) The consultants will undertake rapid environmental assessments using a checklist of parameters in order to categorize the future urban sub-projects as A, B and C. Initial environmental examinations (IEEs) will be prepared for all category B future projects and due diligence reports (DDRs) for category C projects consistent with EARF. IEEs prepared for future projects will include environment management plans (EMPs). If existing facilities are involved an Environment Compliance Audit may also be needed The design team will work closely with environment team to ensure that environment requirements are incorporated into project design from start. The design team needs to work with environment team to ensure that environment requirements are incorporated into project design from start.

28) The environmental management plan will also be included in bidding documents and contracts. For the ensuing loan projects, this will include all the above provisions to be included in the contracts for contractors to carry out all environmental and social mitigation and monitoring measures outlined in their respective contract.

29) Prepare public awareness programs, communication plans and identify training requirements if any as necessary for the project partner agencies and asset owners on subproject construction, operation and maintenance.

30) Prepare action plan and report on implementing relevant part of the gender action plan of the project.

31) The design consultants shall identify and indicate in advance on the required approval processes with regard to national framework and assist the client in obtaining required statutory approvals for the subproject implementation from competent authorities.

32) The Consultant shall perform with reasonable skill and care the services for multi-disciplinary design services, necessary to achieve the completion of the Project in accordance with the Project requirements, including services that are necessary, but not expressly detailed in this scope of services.

33) Based on the costs estimates prepared and the project schedules approved by the client., the consultant should perform the following tasks:

(a) Preparing full set of working Drawings comprising of Architectural, Structural, Services Interior Décor, Landscaping etc which are suitable for construction shall be authorized by the professionals to the acceptance of the client ;
(b) Co-ordination with Employer's representatives and Technical Evaluation Committee members on finalizing extent and sufficiency of details presented in working drawings and contract packaging;
(c) Preparation of Bill of Quantities, and specifications.
(d) Consultant shall submit to the Employer the following documents necessary for inviting bids such as:

(i) Pricing Preambles,
(ii) Specifications;
(iii) Bills of Quantities;
(iv) Instructions to bidders (based on ADB standard documents);
(v) General Conditions and Particular Conditions of Contract (based on ADB standard documents;
(vi) Warranties / Guarantees requirements;
(vii) Instructions of Supervision of works;
(viii) Program of Works;
(ix) Full set of Architectural, Structural and Services working drawings;
(x) Bidding documents for procurement of works / goods etc.

34) Bidding and Negotiating Stage**:** During this stage, the consultant shall obtain the approval of the Employer to all Bidding Documents.

(i) Assist the Employer to invite bids for the project, based on the bid document approved by the Employer;
(ii) Assist to conduct pre-bid meetings, answer queries and advise Employer and bidders on all technical and procedural matters during bidding;
(iii) Advise and attend to the closing of bid receipt and opening of bids;
(iv) Assist in evaluation of the bids;
(v) Assist the Employer to select a Contractor including negotiations with bidder on finalizing the Contract;
(vi) Advise the Employer on issue of Letter of Acceptance and Award of Contract by providing a suitable draft letter;
(vii) Arrange contract documents for the signing of the Contract by the Employer and the Contractor;
(viii) Arrange to hand over the site and the relevant documents to the Contractor; and
(ix) Review and finalize the construction program and other instructions.
(x) Prepare Quality Assurance Document for quality implementation of works. .

3.2 Downstream Work

35) The Design Consultants would be required to address the design issues during the Construction Stage as and when required. All corrective actions attributable to the consultants' mistakes to be addressed by the consultants at no additional cost to the client.

3.3 Training as a specific component of the assignment

36) There is no specific training component in the assignment.

4. Team Composition &Qualification Requirements for the Key Experts and Key Activities

37) **Key Experts - International and National:** The list of Key Experts (International and National are given in Table 1 below.

Table 1 - Key Staff

No.	Details of the Expert	Number	Months / Qty
International Expert			
1	Team Leader Cum Sr. Environmental Engineer /Project Manager	1	15
2	Climate Change Specialist (for Designs with Climate change factor)	1	1
	Sub Total International Experts		**16**
Key National Experts			
1.	Deputy Team Leader cum Environmental Engineer (Storm Water Drainage Expert)	1	15
2.	Deputy Team Leader cum Environmental Engineer (Solid Waste Management Expert)	1	15
3.	Storm Water Drainage / Hydraulic Expert	1	14
4.	Drainage Modeling Expert	1	6
5.	Hydrologist	1	5
6.	Solid Waste Management Expert	1	14
7.	Civil / Infrastructure Engineer	2*14	28
8.	Structural Engineer	2*8	16
9.	Treatment Expert	1	4
10.	Water Quality Expert	1	4
11.	Financial Expert/Economist	1	4
12.	Senior Quantity Surveyor	1	10
13.	Safeguard Specialist (Environment)	1	8
14.	Safeguard Specialist (Social)	1	8
15.	Gender and Communications Expert	1	3
16.	Procurement Specialist	1	10
17.	Geotechnical Engineer / Expert	1	4

18.	Sewerage / Septage Management Expert	1	4
19.	GIS / Survey Expert	1	4
20.	Mechanical Engineer	1	6
21.	Documentation Expert	1	2
22.	Planning Engineer	1	6
23.	Electrical Engineer	1	6
24.	Ecologist	1	4
	Total National Experts	26	200

4.2 Key Staff - Qualifications and Key Responsibilities - International Experts

38) **Expected Qualification Requirements and Tasks assigned to the Key experts:** The Consultant is expected to propose experts adequately qualified and experienced to undertake efficiently the task/ responsibility assigned to them. The tasks/ responsibility assigned and detailed educational qualification and experience requirement for the respective expert are as mentioned below.

39) **Team Leader cum Sr. Environmental Engineer/ Project Manager**: The preferred qualification is a graduate civil / environmental engineer with post graduate degree in Environmental Engineering or equivalent with around 15 years of experience in senior positions in urban infrastructure development projects preferably funded by external funded agencies. The expert is responsible for overall management of the assignment and all the outputs. The expert would guide the team on submission of the quality deliverables on schedule. Team leader will be responsible for overall project management and administration, appraisal of subprojects as required, advice on procurement and bid process management. As a major experience requirement, the team leader should have experience in working in projects on planning and design Solid Waste Management or Storm Water Drainage in his previous projects.

40) **Climate Change Specialist**: Graduation in relevant field and around 5 years of experience in designing infrastructure. Has experience in designs based on climate change factors and preferably in externally funded projects. Has to guide the team in considering climate change factors in various designs of the assignment.

4.3 Key Staff - Qualifications and Key Responsibilities - National Experts

41) **Deputy Team Leader cum Environmental Engineer(Storm Water Drainage Expert):** The preferred qualification of the expert is graduation in civil / environmental engineering with post-graduation in Drainage /Hydrology or related discipline with around 12 years' experience in implementing the infrastructure development works in Environment Management Services sector in a senior position. Experience in the externally funded projects and in projects of Strom Water Drainage will be an added advantage. The Deputy Team leader will be responsible for overall implementation of the work of the respective discipline. The expert will coordinate with relevant

local authorities to deliver the required outputs. He/She is responsible for preparation of the Storm Water Drainage Master Plans for the four project cities and also for designs and preparation of the Detailed Project Reports. He will coordinate the work of all the team members of the respective discipline..

42) **Deputy Team Leader cum Environmental Engineer (Solid Waste Management Expert):** The preferred qualification of the expert is graduation in civil / environmental engineering with post-graduation in Solid Waste Management / environmental engineering or related discipline with around 12 years' experience in implementing the infrastructure development works in Environment Management Services sector in a senior position. Experience in the externally funded projects and in projects of Solid Waste Management will be an added advantage. The Deputy Team leader will be responsible for overall implementation of the work of the respective discipline. The expert will coordinate with relevant local authorities to deliver the required outputs. He/ She will be responsible for preparation of solid waste management plans for the project cities and preparation of the Detailed Project Reports. He will coordinate the work of all the team members of the respective discipline.

43) **Storm Water Drainage Expert**: The experts' preferred qualification is post-graduation in the relevant discipline and around 15 years in preparation of drainage master plans and detailed project reports for drainage projects in towns / cities preferably in externally funded projects. The expert should study the Storm Water Drainage situation in the project local authorities and recommend appropriate strategies for drainage management of the project towns. The expert should develop guidelines / templates on the surveys and investigations required for preparing a Storm Water Drainage Master Plans and prepare templates of Storm Water Drainage Master Plan and get the same approved by client before proceeding. The expert will be responsible for preparation of the Storm Water Drainage Master Plans for the project cities, preparation of the designs and detailed project reports for the works under the storm water drainage program. . .

44) Drainage Modelling Expert : The preferred qualification of the expert is graduation in civil / environmental engineering with post-graduation in Drainage Modelling or related discipline with around 10 years' experience in implementing the infrastructure development works in Environment Management Services sector on Drainage Modelling for Mitigation of Flood/Manage the storm Water etc. The expert is required to prepare the required models to assist in designing the systems / works.

45) Hydrologist: The preferred qualification of the expert is graduation in civil / environmental engineering with post-graduation in Hydrology or related discipline with around 10 years' experience in implementing the infrastructure development works in Environment Management Services sector on Water resource Planning and Preparation of reservoir and river flood risk assessment. The expert will assist in risk assessment, preparation of master plans and designs.

46) **Solid Waste Management Expert**: The expert's preferred qualification is a post graduate in Environment / Solid Waste Management or related field and has around 15 years of experience in the Solid Waste Management Projects preferably in externally funded projects. The expert will study the Solid Waste Management Systems in the Project Local Authorities and would

recommend suitable solutions. The expert will prepare an approach paper on preparation of the Master Plan for and design methodology of solid waste management system and design the interventions required for improvement of solid waste management in the Local Authorities. The expert would bring his / her expertise in adopting simple solid waste management system which is technically feasible and economically viable. The expert will prepare master plans and detailed project reports for works of all the four cities. . The expert will suggest the organisation structure and improved procedure for collection, transportation, treatment and disposal of solid waste in the project local authorities and work on other requirements of the ToR. He / She will propose and design all interventions required for efficient solid waste management in the area.

Civil Engineer / Infrastructure Engineer (Civil Engineer with experience in designing Infrastructure works): The preferred qualification is Master degree in Civil Engineering / Infrastructure design with around 5 years' experience. The responsibilities would be to assist in designs of all civil engineering structures and utilities.

47) **Structural Engineer:** The preferred qualifications for expert is post-graduation in structural engineering or equivalent with around 5 years of experience in relevant area. The expert should work on design of the structures that are taken up in the project.

48)

49) **Treatment Expert**: The preferred qualifications for expert is post-graduation in Waste Treatment or equivalent with around 5 years of experience in relevant area. The expert should work on Solid Waste Treatment Mechanisms in the project. He / she will suggest technology / mechanism for safe treatment and disposal of solid waste.

50) **Water Quality Expert:** The preferred qualifications for expert is post-graduation in Water Quality or equivalent with around 5 years of experience in relevant area. The expert should work on recommendation for the Water Quality analysis which required and Reporting to the identifying projects that are taken up in the project. The expert will analyze the quality of water in ponds (if any) which receive water from storm water and suggest treatment systems for purification of ponds / lakes as and if required.

51) **Financial Expert / Economist:** The preferred qualification and experience of the Finance Expert is a post-graduation in finance /economics / chartered accountant or equivalent qualification with relevant degree with around 8 years of experience of working on similar projects and local government financing. The expert will be working on the financial and economic analysis on the subprojects and the package as a whole and ensure that the packages which are financially and economically viable are taken up under the Project. Assist in preparation of the financial / economic analysis sections of the detailed Project report. The financial expert will guide the project in the subprojects earn the desired returns.

52) **Senior Quantity Surveyor:** The preferred qualification would be a graduation in quantity surveying with around 15 years of experience in quantity surveying work in various projects. The expert will prepare templates of quantity surveying of all the sectors. Review the estimates prepared by the sub-teams and assist the procurement specialist in preparation of the bid documents.

53) **Safeguard Expert (Environmental Safeguards):** The preferred qualification and experience of safeguard expert (environmental safeguards) is a relevant post-graduation degree with around 10 years of experience working on similar assignment on environmental safeguards preferably in externally funded projects. The expert will prepare the Environmental Impact Assessment Reports, in accordance to the project categorization under the National environmental act and assist the team in preparing the environmental safeguard reports for non-prescribed projects under NEA and submit them in the Detailed Project Report. The Environmental Impact assessment report for the sub projects specified under the list of prescribed projects shall be with the required information/data in order to obtain the TOR from the CEA to carryout IEE/EIA. Also, will prepare an Environmental Management Plan (EMP) for each sub project enabling to monitor the compliance in the construction sites. The expert will prepare brief awareness modules on environmental safeguards for project and contractors staff with list of compliance requirements. The experts' deliverables will be in accordance to the ADB - Safeguards Policy Statement as applicable to date and the relevant GoSL regulations / guidelines.

54) **Safeguard Expert (Social Safeguards):** The preferred qualification and experience of the safeguard expert (social safeguards) is a relevant post-graduation degree with around 10 years of experience working on similar assignments on social safeguards preferably in externally funded project. The expert will prepare the Resettlement Plans and Indigenous Peoples Plan as applicable to the subprojects. Also, will prepare the Diligence Reports for the Social Safeguards for category 'C' subprojects. The expert will prepare brief awareness modules on social safeguards for the project and contractor's staff with list of compliance requirements. The expert will also assist the team in preparation Social Safeguards section of the Detailed Project Report. The experts' deliverables will be in accordance to the ADB - Safeguard Policy Statement as applicable to date and the relevant GoSL Regulations / guidelines. The Social expert will also advice on implementation of the Gender Action Plan and train the project officers on collection of sex-dis-aggregated data and conducting gender sensitization programs and the procedure of consultation during design, implementation and post implementation of projects. .

55) **Gender and Communication Expert:** The preferred qualification and experience of the Gender and Communication Expert will be a relevant degree with around 8 years of experience of working on similar assignments on gender and communications preferably in external aided projects. The expert will assist in preparation of Gender Action Plan and Consultation Plan for the Project. The expert will also prepare the schedule for the awareness programs and training on gender sensitization programs. The expert will prepare formats for reporting progress on gender action plans and sex-dis-aggregated data and also train the project staff in filling the information.

56) **Procurement Expert:** The preferred qualification for this position is the graduation in civil engineering and experience as procurement of works in government projects for the last 10 years preferably in externally funded projects. The expert would be responsible to assist the project in the preparation of the bid documents for the specific subprojects. The procurement specialist will be stationed in the central office, will collect all the details from the sub-team offices and prepare the documents. Will assist the project in invitation of the documents, pre-bid meetings, evaluation and award of bids and obtaining the PCSS numbers for the awarded contracts. Will also prepare the procurement fact sheets for uploading in project website.

57) **Geotechnical Expert:** The preferred qualifications for the expert is graduation in civil engineering with post-graduation in Geotechnical Engineering. The expert will be responsible for deriving specifications and organizing all the soil investigations in accordance to the requirements of the project and also recommend foundation types based on the soil conditions. The expert will also advice on the land fill solutions in solid waste management sectors.

58) **Sewerage / Septage Management Expert**: The preferred qualification for the expert is graduation in civil engineering with post-graduation in Public Health / Environmental or relevant Engineering with around 10 years of experience in design of sewerage / septage management systems. preferably experience in external funded projects. The expert should design all the Sewerage / Septage Management schemes (if any) in the project.

59) **GIS / Survey Expert:** The preferred qualifications for the expert in a graduation in the relevant field with qualifications in GIS / Surveys. The expert will help the project team in surveys and mapping requirements of the project.

60) **Mechanical Engineer:** The preferred qualification for the expert is graduation in mechanical engineering with around 7 years or relevant experience. The expert will design all the mechanical components of the subprojects.

61) **Documentation Expert:** The preferred qualification is Graduation in Documentation Science / related discipline with 5 years' experience in documentation works of similar nature.The expert will assist in getting the records of the flooding in the area and provide it to design team. Will assist in collection of all details and historic data as required by the team and documentation expert will assist in all documentation works of the project. .

62) **Planning Engineer:** The preferred qualification for the expert is graduation in civil engineering / relevant discipline and post-graduation in urban with around 7 years or relevant experience. The work includes assisting in location of facilities of solid waste management based on planning requirements.

63) **Electrical Engineer:** The preferred qualification for the expert is graduation in electrical engineering with around 7 years or relevant experience. The expert will design all the electrical components of the subprojects.

64) **Ecologist:** The preferred qualification is Graduation in relevant discipline with 8 years of experience in ecological studies. The responsibilities are to assess the ecological impact of the proposed developments and advice the project accordingly. Suggest suitable mitigation measures to protect the ecology of the areas identified under solid waste management component of the project. He will prepare the Detailed Project Report of all the subprojects related to Solid Waste Management and prepare an operation manual for the solid waste.

5. Reporting Requirements and Time Schedule for Deliverables

1) *The General Deliverables with time lines of some common report are as follows:

Type of Report	Time Line
Inception Report	Within 15 days of Mobilization
Monthly Report	Within 5th of every month
Quarterly Progress Reports	Within the first quarter of every quarter.
Solid Waste Management Component	
Data Analysis Report on Baseline Condition of solid waste management four cities	As agreed during contract negotiations
Stakeholder Consultation report	As agreed during contract negotiations
Institutional Analysis Report	As agreed during contract negotiations
03 Scenarios (Options) on proposed Waste Management Systems with feasibility(environment, Social and financial) report	As agreed during contract negotiations
Interne Report	As agreed during contract negotiations
Final Master Plan with strategies	As agreed during contract negotiations
Storm Water Drainage improvement and flood Mitigation Component	
Baseline Report with data analysis Report	As agreed during contract negotiations
Stakeholder Consultation Report	As agreed during contract negotiations
Institutional Analysis report	As agreed during contract negotiations
Urban Drainage system modeling	As agreed during contract negotiations
Hydraulic modeling and modeling report	As agreed during contract negotiations
Flood Risk Assessment	As agreed during contract negotiations
Strategies and Feasibility Analysis Report	As agreed during contract negotiations
Master Plan with Feasibility Reports	As agreed during contract negotiations
For both components above	
Detailed Project Report for identified strategies with drawings and annexures (Contains feasibility study, resettlement report, estimates, all required drawings, social, environmental and financial analysis report, and all required sections) – Drawings to be sufficient for construction	As agreed during contract negotiations
Safeguard Reports	As agreed during contract negotiations
Other Reports as mentioned in the TOR	As agreed during contract negotiations
Bid Documents	As agreed during contract negotiations
Final Completion Report	Within one month of completion of the assignment

2) The consultant will need to submit any other reports as desired by the Project Management Unit and Project Implementation Units. The submission needs to be in 5 copies of each report with 2 Softcopies in CDs.

3) All reports need to be submitted to the particular Project Implementation Unit and Project Management Unit.

5.1 ***Working Hours***

4) The experts shall not be entitled to be paid for overtime nor to take paid sick leave or vacation leave.

5) The consultant should work all the days in the month excluding Sundays and Mercantile holidays for the eligibility of billable one month otherwise the remuneration will be proportionally. A working of 22 days will be considered as one billable month and each billable day is for 8 hours.

6. Client's Input and Counterpart Personnel

6.1 Services, facilities and property to be made available to the consultant by the client:

The maps and other data related to this work, to the extent available will be provided. All other logistics to be the responsibility of the Consultant.

6.2 Professional and support counterpart personnel to be assigned by the client to the consultant's team:

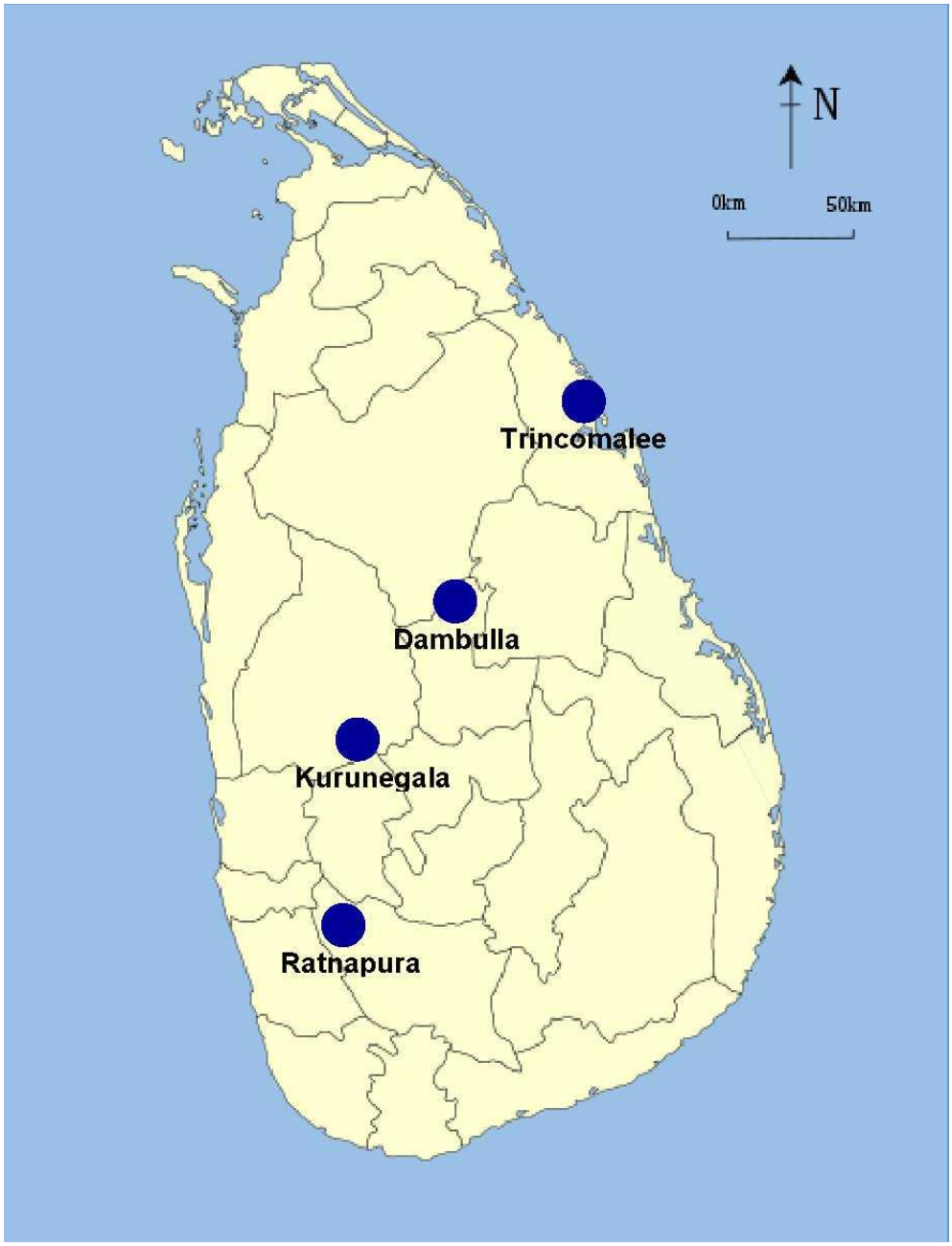
The client will facilitate the consultant through the staff of PMU and PIU when it is required. But there will not be any specific counterpart personnel assigned by the client to the consultant team.

7. Client will provide the following inputs, project data and reports to facilitate preparation of proposals:

6) The maps and reports as available with the client will be provided to the Consultant.

Annexure 1

Map Showing Location of the Proposed Project Towns - Sustainable Urban Development Project



Annexure 2

Terms of Reference for each sub-sector design and implementation

ToRs of all subsectors to be read in conjunction with the General Scope of work mentioned earlier in this document

1.0 Scope of Work- Improvement to Storm Water Drainage System.

The main objective is to prepare a Master Plan for Storm Water Drainage System for all four cities.

Specific tasks of consultancy on works related to Storm Water Drainage improvement apart from the general tasks described earlier are:

a) Using available maps, topographic sheets and by reconnaissance and detailed survey of the catchment and sub-catchment areas, determine storm water flow and show on a plan in the form of modules covering the catchment area.
b) Analyze rainfall data of the previous years (no. of years would be in accordance with the standard practice followed in the country) and estimate storm run-off per unit area for various storm frequencies;
c) Prepare an outline drainage plan for the area and identify missing links and prioritized program of improvement works.
d) For priority drainage area, carryout detailed topographic survey and leveling to prepare longitudinal sections of the system and cross sections of important and major channels and drains covering a width of 15 m on either bank generally at intervals of 10 m along with L-sections and detailing all the temporary and permanent structures met within that width. All the structures and encroachments will also be marked with enough details.
e) Indicate the details of other underground services, mainly sewers and water mains (electrical cables) which are in the vicinity of the storm water drainage system and show their distance from storm water drains with a view to know about the possibility of providing by-pass storm water drain and for deciding their location.
f) Indicate the inundation area clearly, showing probable depth of water accumulation in case of intensity of rainfall as agreed with the Local Authority.
g) Locate all ponds and flood water holding ponds/zones in part portions of open gardens or playgrounds – showing therein probable size duly dimensioned should be shown on plan along with various arrangements / devices to dispose-off the accumulated water to nearest outfall or conserve the water so as to reduce the shortage of water supply and to be shown in a tabular proforma.
h) Carryout analysis of existing situation of storm water drains to identify deficiencies and develop alternative strategies and options for expansion / augmentation of the existing system to address system deficiencies.
i) Prepare a Strom Water Drainage Master Plan for the entire area and identify the priority areas to be developed under the project.
j) Prepare detailed cost estimates for priority works to the extent of availability of funds. Estimate necessary road restoration charges wherever needed.
k) Prepare a traffic diversion plan as necessary and incorporate in bidding documents.
l) Prepare necessary safeguard and economic analysis reports.

m) The storm water drainage component should also include restoration of the silted tanks (if any) and planning for the catchment areas of these drains.

n) The designs should consider the climate change effects.

o) Environmental enhancement shall be considered as green initiatives and included to the designs.

2.0 Scope of Work: Sector Solid Waste Management – Specific tasks

(i) The scope of work covers but not limited to the following:

- Prepare the Solid Waste Management Plan for the four cities for a horizon of 30 years. The overall aim of the strategy is to develop a tailor-made and sustainable solid waste management system that is accessible and affordable to the city and minimize adverse impacts. The plan should be acceptable to the local partners and shall be conducted though a very comprehensive consultation of the stakeholders.

(ii) The various studies required to be conducted prior to preparation of the plan but not limited to is as below:

a) To conduct a waste characterization study in the city ;

b) To establish current status and baseline of solid waste management by each Local Authority;

c) Based on the above, analyze the technical, economic, environmental, financial and social feasibility for various components of solid waste management such as source segregation, collection, transportation, treatment and disposal by composting and landfill; Consultant shall look into viable options to fit into the city management mechanism.

d) In regard to collection and transportation

- establish criteria and standards for waste collection services in various zones and for various waste source characteristics (residential, commercial, industrial etc.)

- determine specific generation rates for the various waste generator characteristics and make necessary projections.

- determine waste generation for each zone for design of collection and transportation system.

- design appropriate collection and transportation systems which are appropriate for various areas such as low and high density residential areas.

Commercial areas, markets etc. Special emphasis should be placed on designing a suitable collection system for the urban poor and slum areas.

- assess the options contracting out collection services to the private sector including the involvement of NGOs and communities in providing the primary collection services assess alternative institutional and contractual arrangement.

- assess the institutional arrangement and options for contracting out transportation and disposal services.

e) The consultant will analyze the costs involved with complete breakups for the above methodologies of waste disposal for the Local Authority;

f) The consultant will carry out all the required investigations of the sites selected for of the landfill and other facilities proposed and the designs must meet the technical guidelines provided by the Central Environmental Authority (CEA);[1]

g) To identify clusters in addition to the Local Authorities mentioned for setting up common landfill facility based on cost benefit financial analysis and assess the feasibility of making such an arrangement;

h) To develop a financial model in order to have a cost-effective transportation solution;

i) Based on the above, work out cost-benefit analysis of individual Local Authorities involved in the cluster (if clusters are taken);

j) The consultant should consider waste minimization and recovery options;

(Not limited to the above the it is the consultant's responsibility to conduct all the required studies and surveys.)

(iii) The design of the interventions in the plan should be such that it should not be an isolated solution to a single problem, but an integrated and logical part of a whole system including the whole chain of events from the source to final treatment or disposal. Emphasis should also be on operation and maintenance of such a system, both in provision of funds and human resources, to ensure the sustainability of the project. The concept of appropriate technology should be adopted. This can include promotion of new technology (Pyrolysis or Gasification) and low-tech, labor- intensive solutions (eg. Composting) that meet the needs and suit the conditions of the question. The choice of technology or system can also depend on visions for renewable energy, green housing climate change etc.

(iv) The interventions to be inclusive all stakeholders to be encouraged to actively participate in the planning process. Gender aspects are crucial as women and children are more vulnerable to adverse effects of pollution and women are more often responsible for waste management in households, so they are vital for any development therein.

[1]Central Environmental Authority - Technical Guidelines on Solid Waste Management in Sri Lanka.

(v) After the plan is prepared, the consultant should prioritize the works to be taken up under the project with in the extent of funds available in the project.

(vi) Prepare detailed designs, drawings, estimates and bid documents for the facilities that are required for effective operation of the disposal facilities and maintaining the environmental standards.

(vii) The consultant should assist the client in obtaining clearances from various statutory authorities for developing the landfill and compost yard.

(viii) To suggest an institutional framework for the construction, operation and maintenance of the regional landfill if found feasible;

(ix) The consultant should assist in obtaining the necessary approvals from the CEA required, .

(x) The consultants are required to carry out the tasks in line with National Solid Waste Management Policy and CEA guidelines, others rules and regulations.