



Feasibility Study Guideline (FSG)

Major Projects Secretariat
Infrastructure Fund, TL



Agriculture
and Fisheries



Water and
Sanitation



Public Buildings



Electricity



Roads



Flood control



Telecom



Airports



Ports



Chapter I
GUIDELINE FOR FS IMPLEMENTATION



Chapter II
GUIDELINE FOR ECONOMIC
& FINANCIAL ANALYSIS



Chapter III
SAMPLE FORMS BY SECTORS
FOR THE FEASIBILITY STUDY



Chapter IV
EVALUATION OF THE
FEASIBILITY STUDY REEPORT

March 2020

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Chapter 1. What process is required for execution of IF Projects?

Currently, for selection of IF Projects, MPS requests to submit “*Application Standard Form*” and “*Project Brief*” to prepare recommendations of IF Projects to CAFI (“*Appraisal Report*”).

Now, MPS requests to carry out a **Feasibility Study (FS)** for major projects based on the *dispatch of the Prime Minister*¹ for the project appraisal procedure as shown in the Figure 1-1.

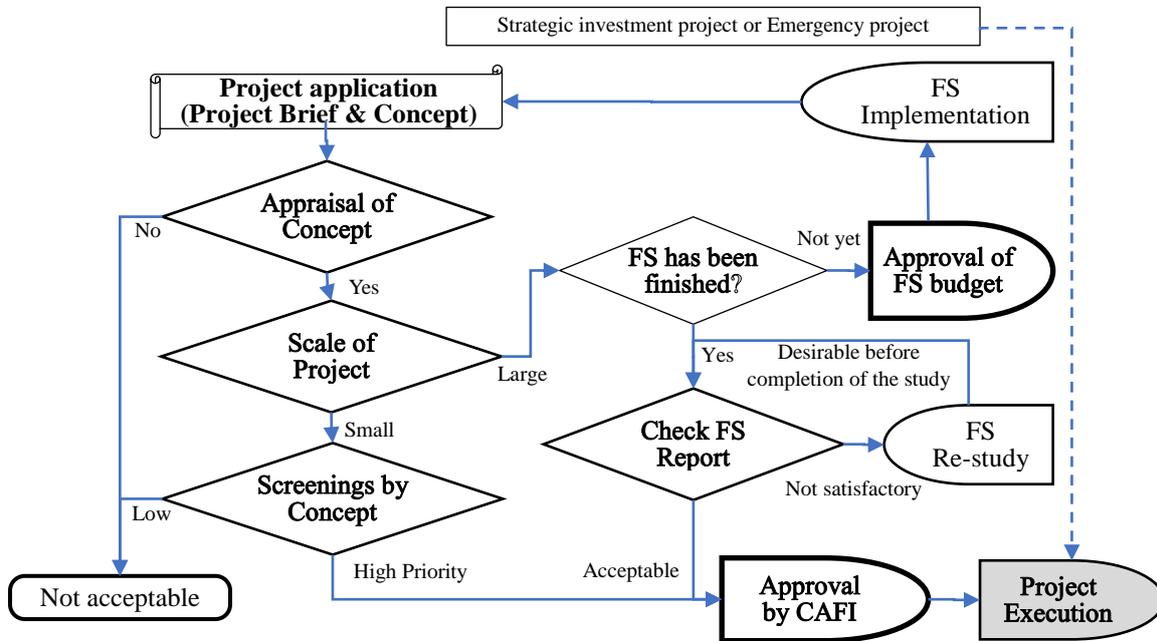


Figure 1-1: FS and Project Execution Process

Please refer the Attachment 1-10 of this Guideline for the detailed process up to the approval of the major infrastructure projects in Timor-Leste.

To propose projects to be financed through the Infrastructure Fund, LMs are requested to submit necessary documents as shown in the Table 1-1 below.

Table 1-1: Application and Appraisal Steps

STAGE	WORK ITEM	DOCUMENTS (and reference)	Assessment/Evaluation (and reference)
1	Application for FS execution	FS Application Form (Attachment 1-12)	For Application Form (Chapter 2 of FS GL Part 4)
2	<i>Approval of execution of FS</i>		
3	Tender for FS	Technical Proposal (Attachment 1-11&1-13) Financial Proposal	For Technical Proposal (Chapter 3 of FS GL Part 4)
4	<i>Execution of FS</i>	<i>Monthly Progress Report</i>	<i>(Hearing & Comments)</i>
5	Evaluations of FS Report	FS Report (Draft & Final) (Chapter 7 of FS GL Part 1)	For FS Report (Chapter 4 of FS GL Part 4)
6	<i>Approval of the Project Execution</i>		
7	<i>Execution of DED, Land Acquisition and Construction</i>		

¹ Letter No. 313/SGP/IX/2018 dated on 14 Sep 2018 about the request of feedback and comments

Chapter 2. What is FS?

The initial stage of the public construction work should start from preparation of the Project Concept, not just an idea. The Feasibility Study is the process that cannot be predicted at the concept stage and required analysis, such as environmental study affects, rough costs, economic effects, etc. FS will examine comprehensively whether the project is important and can be implemented or not. The target project should be listed in one in the upper plans as shown in Figure 1-2.

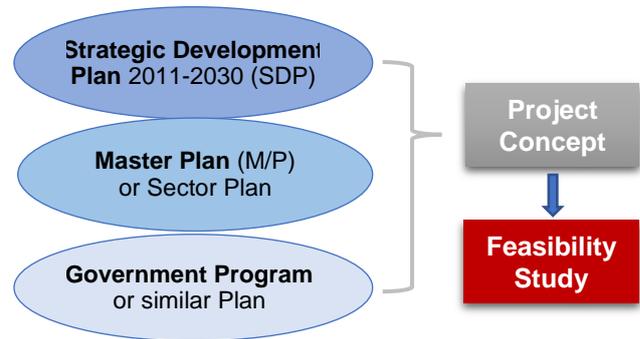


Figure 1-2: Upper plans for selection of FS

After Feasibility Study project process enters into DED, Construction and moves to O&M Stage as shown in the Figure 1-3.

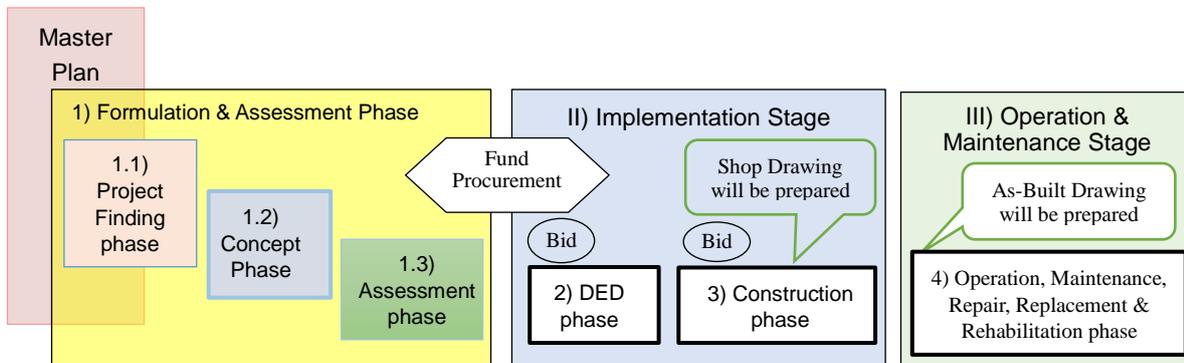


Figure 1-3: Overview of Project cycle

Source: United States Army Corps of Engineers (USACE)

At first, the **Master Plan** is necessary to study current issues in the area or sector and to formulate project to solve the problem. In case of a large scale of the project, the Master Plan for the project itself should be prepared that will cover several projects.

The **Feasibility Study** is a kind of assessment phase for comparatively large project in case when major risks and environmental influence cannot be ignored. In case of the small project, assessment could be executed internally based on the Project Concept (please refer to the Chapter 3 of the FS Guideline).

Based on the **FS**, the budget for the project execution could be allocated, and **DED** work could be started after the issuance of the Environmental License (EL). Land Acquisition (LA) should be executed based on DED.

The Table 1-2 shows a comparison of main project items to study at each stage.

Table 1-2: Major Items to be studied on each stage

	Concept	FS	DED	Construction	O&M
<i>Main purpose</i>	Check the plan/idea practical or just idea	Study how to make feasible	Estimate the cost to ensure the budget	Realize durables one	Contribute to the social/beneficiaries
	<div style="border: 1px solid green; border-radius: 10px; padding: 2px; display: inline-block;">Relevance</div>				
<i>Background</i>	Confirmation of project position in the development plan		x	x	x
	Confirmation of related regulations		x	x	x
	Check for privatization		x	x	x
<i>Defining the problem</i>	Current status		x	x	x
	Current issues	Specific issues on execution		Issues on construction	Risk management
<i>Environment</i>	<div style="border: 1px solid green; border-radius: 10px; padding: 2px; display: inline-block;">Impact</div>		EIA & Countermeasures	Monitoring	
	x	Natural environment study			
<i>Who is the beneficiary?</i>	Justification of the new project		<div style="border: 1px solid green; border-radius: 10px; padding: 2px; display: inline-block;">Efficiency</div>		x
<i>Possible Schedule</i>	Time schedule		Detailed schedule	Progress control	x
<i>Budget & Revenue Financial Economical</i>	Financial resources	Detailed cost estimation		Cost control	x
	Operation methods		x	<div style="border: 1px solid green; border-radius: 10px; padding: 2px; display: inline-block;">Effectiveness</div>	Expenditure management
	Possibility of Revenue		x	x	Revenue management
	<div style="border: 1px solid green; border-radius: 10px; padding: 2px; display: inline-block;">Sustainability</div>				
<i>QQA (Quality, Quantity and Accuracy)</i>	x	x	Quality Control		x
	Rough scale	Rough Quantity	Detailed Quantity	Quantity Control	x
	x	x	x	Accuracy control	x

Chapter 3. For what kind of project FS is necessary?

Principally, FS is required to all projects. However, some projects are executed without FS. The Table 1-3 shows for what kind of project its necessary to execute FS, and for what kind of project FS usually is not implemented.

Table 1-3: When FS is necessary and not necessary?

Category	Example	Remarks
FS is necessary	Infrastructure project with the large scale of development plan	Project of which estimated Budget is more than US\$ five million per project ²
	Improvement Project with the expansion or widening plan with possible new social influences	influences such as resettlement of the peoples, and possibility to the environmental affect (i.e. rare species)
	Commercial project / for example, <i>Tourism project</i>	Financial analysis will be prioritized
FS usually is not necessary	Urgent countermeasures for the damage by natural disasters	Countermeasure-project based on a long-term perspective against disaster is an object for FS
	Symbolic / Religious project	Example: Parliament Hall, National University, Public Park, Sports Stadium, National Cemetery, National Church etc.
	Expansion / Maintenance Project with normal demand	FS may become necessary if the expectable demand is few (Such as traffic volume in case of road project)
	Small project	Appraised internally based on Project Concept
	<i>Project which has no prospect of feasibility</i>	<i>as the result of appraisal by Project Concept</i>
	Study/Survey Project how to solve the current issues	It will be checked by Project Concept or preliminary study (such as for environmental affect)

Good Project Concept is necessary for all projects
(see Chapter 5 of the FS Guideline Part1)

² FS is requested for the project with its estimated cost of more than US\$ 5 million tentatively

Chapter 4. Why the Project Concept is necessary for FS?

The expected process of a project in Timor Leste is shown in the Figure 1-4 below:

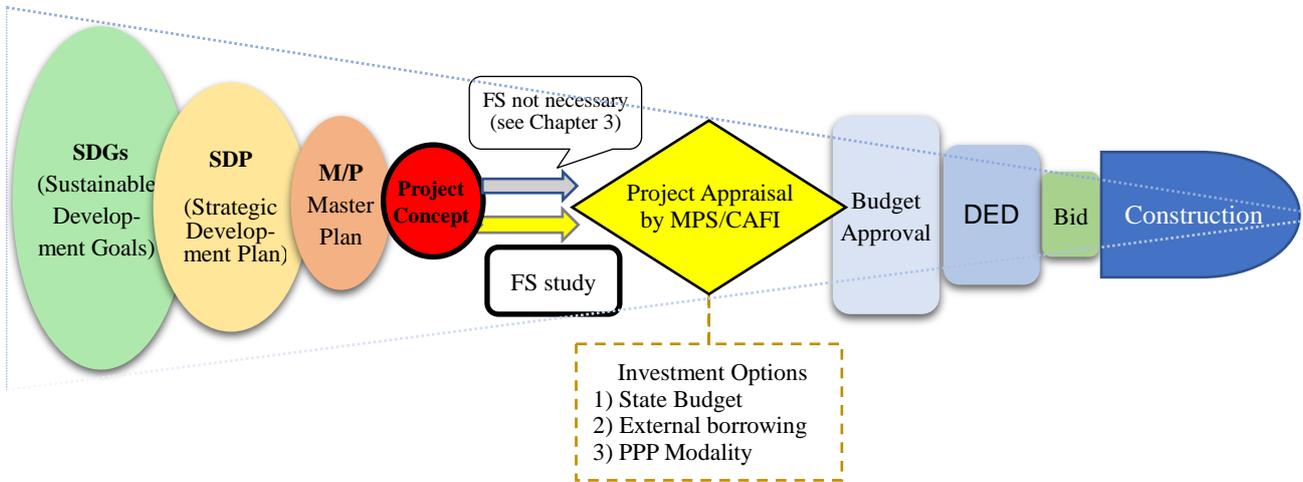


Figure 1-4: Project Process

The executing agency should prepare a Project Concept as the first step of the project preparation process as shown in the Table 1-4 to clarify the proposal is practical or just an idea or dream. From the Project Concept, the Government could decide that the proposal is feasible and worth implementing FS or not. The Project Concept and FS have the following relations.

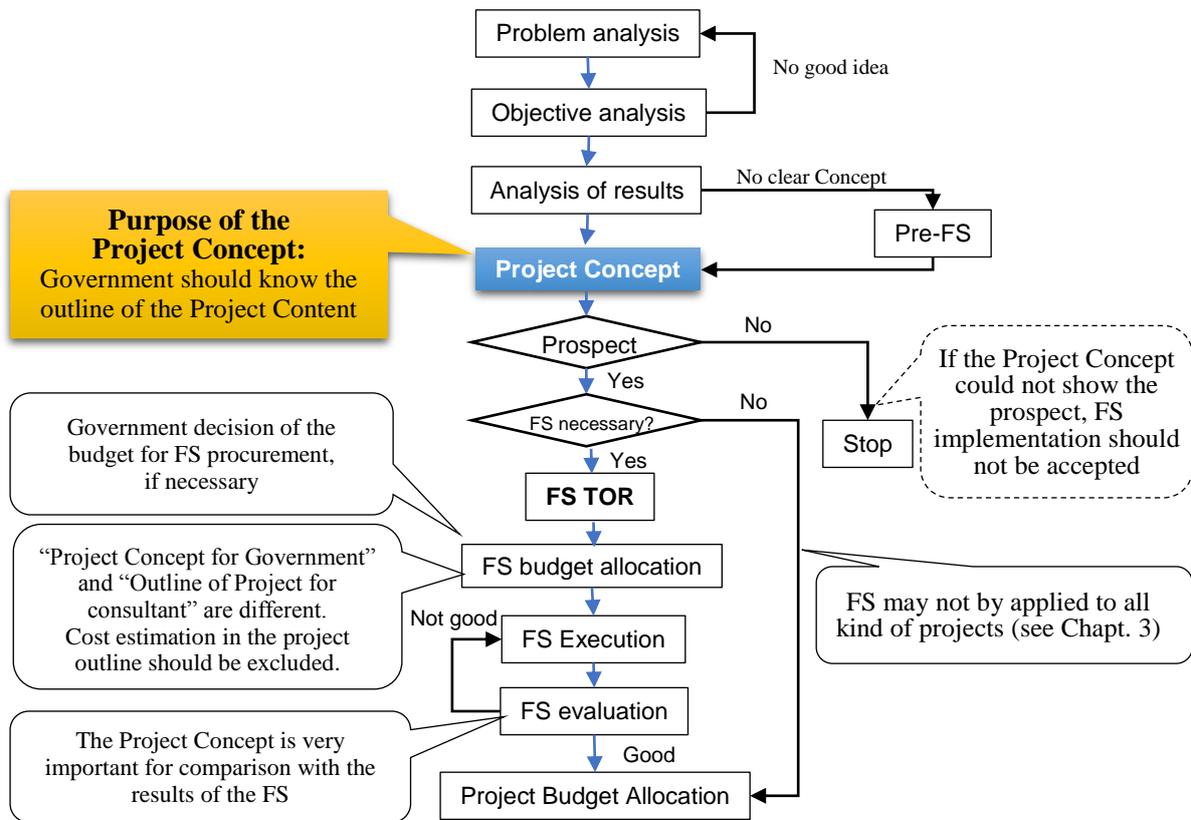


Figure 1-5: Process for project Implementation

Chapter 5. What content is necessary for the Project Concept?

Preparation of the “Project Concept” is important precondition to prepare application Form in the Attachment 1-12 and to get the approval of FS budget and execution of FS.

FS should not be implemented without a good “Project Concept”. However, preparation of the “Project Concept” is not common in Timor Leste.

- ✓ “Project Concept” is also called Concept design or Concept Plan;
- ✓ The Concept is **not just an idea**. It should have minimum principal elements, such as *What, Where, Why, When Who and How much* as shown in the Figure 1-6;
- ✓ The estimated cost in the Concept becomes the base of the checking of FS report;
- ✓ “Project Concept” should be clarified by LMs to propose required project.

The “Project Concept” should include the following items³:

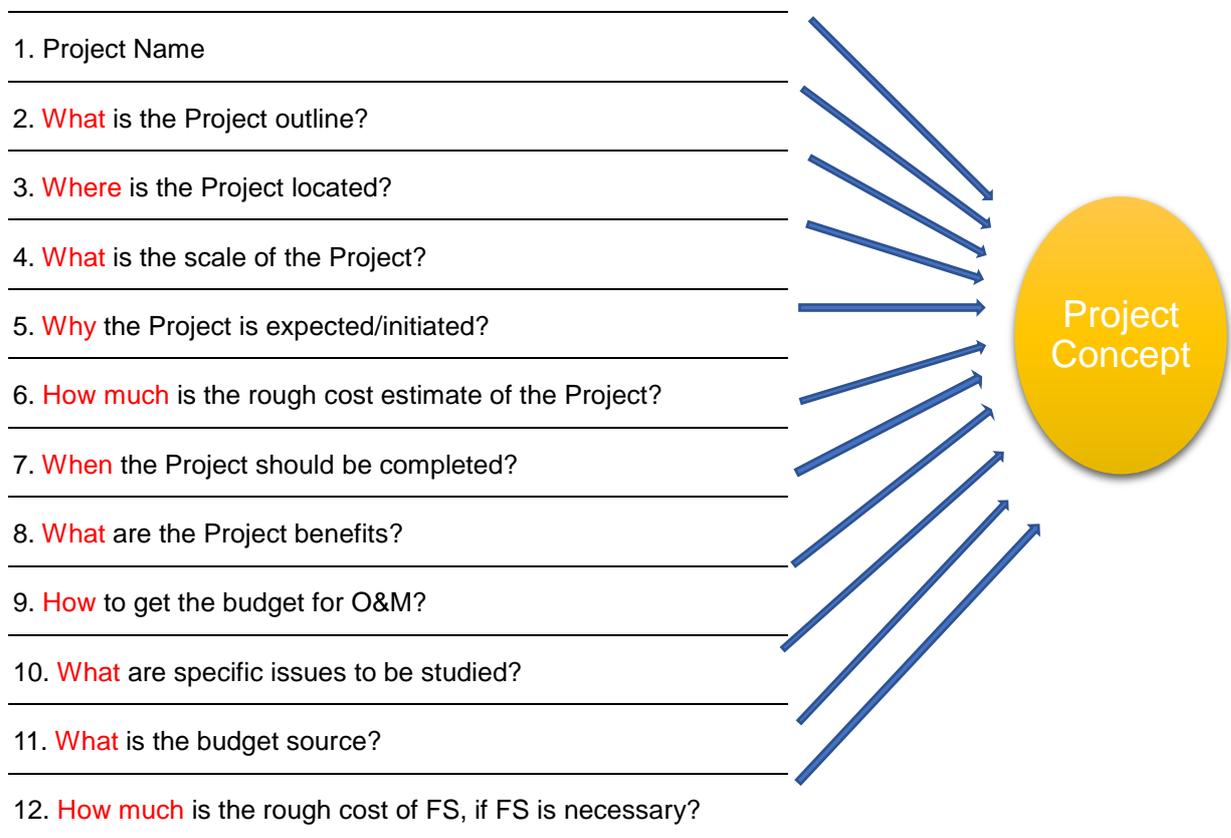


Figure 1-6: Element of “Project Concept”

The Project Concept should be prepared in a tabular form. The example of the Project Concept form is shown in the following Table 1-4.

³ These sequences are variable according to the Project Character

Table 1-4: Project Concept Format

1. Project Name					
<i>Describe simple Name which shows the character of the Project</i>					
2. Outline of Project (Within a few lines as shown below)					
<i>“In (Location / Target), completion of (Project Purpose) will contribute to (Overall goal) by executing of (Output)”</i>					
3. Project Location Map or Photo					
<i>Location name with map/pictures or photo</i>					
4. Outline Scale: (not quantity) Show by the comparison table about “Current status” vs “Expected Plan”					
<i>(Example)</i>		<i>Current status</i>		<i>Expected Plan</i>	
Area (m2) or Length (km)					
Capacity					
Total employee number					
Current Issues / Items to be improved					
5. Relevance: (Background)					
<i>List of upper plans (with page number) in which the project is recommended</i>					
6. Rough Cost estimate					
<i>Very rough estimate. Attach breakdown at the end of this Table, if possible</i>					
7. Implementation Schedule (Expected schedule like below Table)					
	<i>F/S</i>	<i>DED</i>	<i>Land Acquisition</i>	<i>Construction</i>	<i>O&M</i>
	<i>(2020)</i>	<i>(2021)</i>	<i>2022-2024</i>	<i>2023-2026</i>	<i>2027-</i>
	<i>(6 months)</i>	<i>(12 months)</i>	<i>3years</i>	<i>4 years</i>	
8. Project Benefits					
<i>Quantitative: B/C, Redemption period</i>					
<i>Qualitative: Narrative in few sentences</i>					
9. Financial prospect for O&M (show by the comparison style)					
<i>(Example)</i>		<i>Current status</i>		<i>Expected Plan</i>	
<i>Annual Revenue (by 1000US\$)</i>					
<i>Expenditure for O&M (by 1000US\$)</i>					
<i>Direct staff number for O&M</i>					
10. Specific Item to be studied (if F/S is necessary)					
<i>Study items to solve the Current issue</i>					
<i>(it is not good to describe the current issues only)</i>					
11. Expected Financial Resources					
<i>“Infrastructure Fund” or “Loan” or “Grant”</i>					
12. Estimated F/S budget (if F/S is necessary)					
<i>Very rough estimate</i>					

The Project could be pre-appraised by using following rating from the Project Concept & Self Project Evaluation Sheet as shown in the Table 1-5.

Table 1-5: Example of Self-Evaluation Sheet

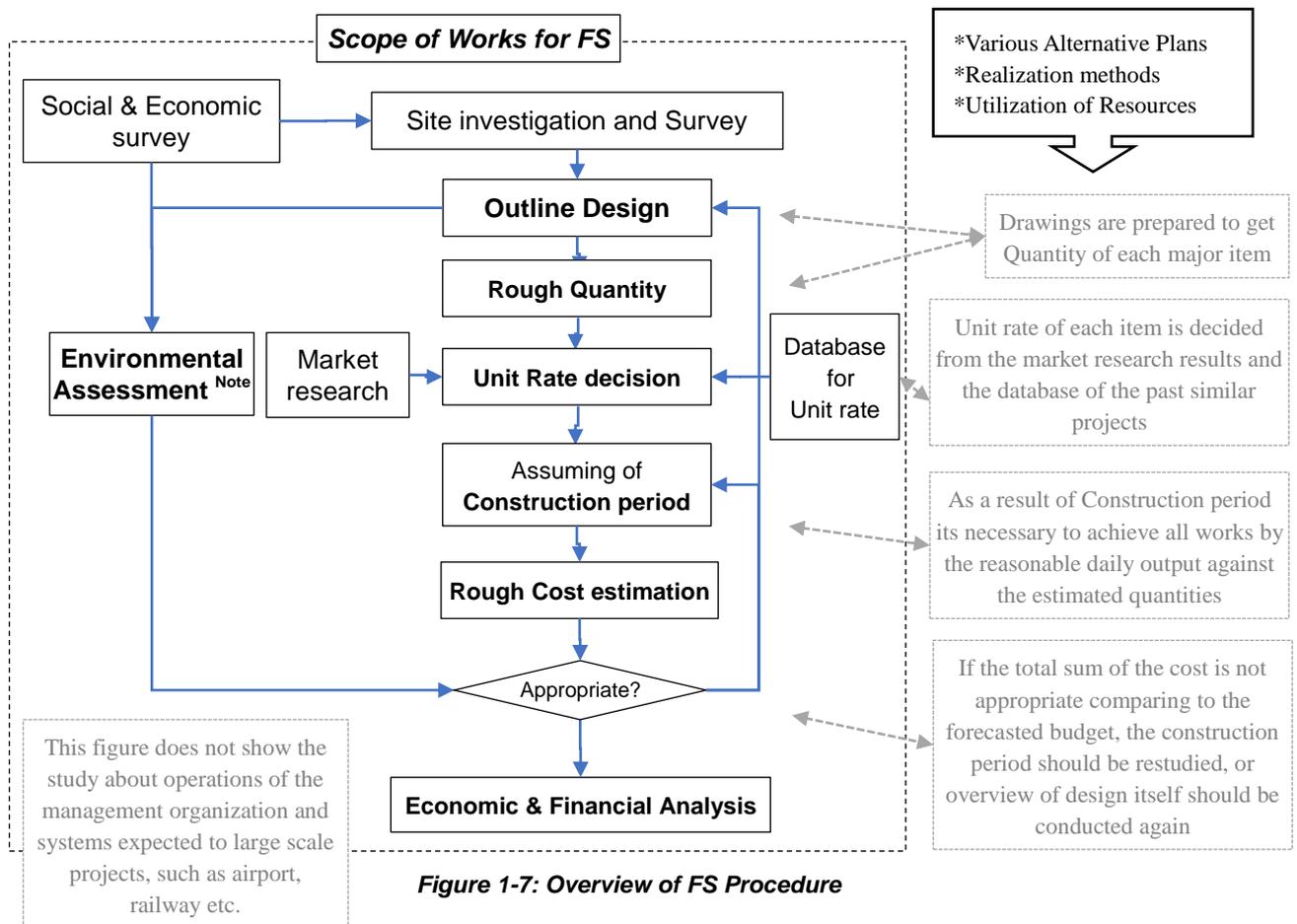
Main Item	Sub-item	Indicator	Examples of Indicators and reference data			
Investment Efficiency	Cost-Benefit during evaluation period	Total Cost	1-5	5-10	>10	no inform
		Cost benefit ratio (B/C)	>2	>1.5	>1	<1
		Internal Rate of Return (IRR)	>16%	>12%	>8%	<8%
Situations for implementation/conservation	Relevance of Project	Relationship with higher level plan	Master Plan	Sector Plan	Strategic Plan	no
		Type of Project	Basic Infrastructure	Economic Infrastructure	Social Infrastructure	no
	Possibility for Project Realization (or Conservation possibility after completion)	Consensus of local people	Already accepted	Negotiated	Start negotiation	No process
		Situations of legal procedures	Approved already	Sure	On application	No process
		Budget status	Already in the budget book	Next year Budget Plan	Only proposal	No process
		Status of O&M plan	Approved O&M budget	Already has O&M plan	On preparation	No process
	Forecasted technical difficulty	Topographic condition (flood)	No risk	Low risk	Medium risk	High risk
		Topographic condition (land slide)	No risk	Low risk	Medium risk	High risk
		Advanced technology experience for construction and O&M	A lot of experience	Limited experience	Only single case	No experience
	Project Effect for	Life of the people	Improvement of access / quality to public facilities	Provide initial access	Improve quality (price)	Improve only access
Improvement of public transportation			Direct result from project	Improve public access	Some benefits	Can't expect
Interconnection between communities			Become easy and fast	Become possible	Some expected	Can't expect
Resettlement			No resettlement required	Only a few households	Significant resettlement	Can't expect
Improvement of tourism			Main target	Bring benefits	Some expected	Can't expect
Contribution to healthy life			Health project	Good for health	Some expected	Can't expect
Economy of Concerned area		Expansion of Productivity	Create new products	Improve import/export	Improve internal trade	Can't expect
		Increasing of Job opportunity	Create new permanent jobs	Support current jobs	Only during construction	Can't expect
Safety securing		Reduction of natural disaster	Direct protection	Improve safety	Somewhat expectable	Can't expect
		Reduction of accidents	Safety project	Improve safety	Somewhat expectable	Can't expect
Environment		Reduction of air/water pollution	No pollution	Pollution during construction	Pollution after construction	Can't expect
		Reduction of noise	No noise	Noise during construction	Noise after construction	Can't expect
		Conservation of soil	No damage	Some damage	Significant damage	Can't expect
		Conservation of rare species	No lost	Some damage	Significant damage	Can't expect
		Improvement of landscape	Give harmony on natural and artificial beauty	There is some minus effect to the natural and regional,	Structure are breaking the harmony of scenery.	Structure are breaking the harmony of scenery.
Local Community		Utilization of local materials and human resources	For construction and O&M	Only for construction	Somewhat expectable	Can't expect
		Cost saving for community	Make profit	Reduce expenditures	Minimize damage cost	Can't expect
		Improvement of regional equity	Direct improvement	Only in some areas	Somewhat expectable	Can't expect
		Promotion of local culture	Develop culture and traditions	Save culture and traditions	Somewhat expectable	Can't expect

Table 1-6: Rating criteria for assessment as self-checking by Consultant

	Conformity	Minus Impact	Achievement ratio	Period/Cost	Rating
Indicators	Good	None	Completed	Less of plan	4
	No problem	Almost none	More than 80% of plan	100%	3
	Some problem	Somewhat	80%-50% of Plan	100-150% of plan	2
	Serious problem	None	Less than 50% of plan	Over 150% of plan	1

Chapter 6. What is the procedure of the FS implementation?

FS is necessary to confirm the validity of the proposed Project Concept. The most important subjects in FS are the financial and/or economic analysis and environmental/social impacts. The Government should decide whether to finance or not for the execution of project based on the results of FS. Site investigation survey, Outline design, Rough Quantity calculation are the base for the Cost estimation. The procedure of FS is shown in the Figure 1-7.



The Attachments 1-8 & 1-9 show the quantity required based on the best practice. However, simple method is expected in case of FS in TL.

Table 1-7: Types of Environmental Assessment

IEE	Initial Environmental Examination	Based on relatively easy-to-obtain information such as existing data, prediction / assessment of environmental impact, examination of mitigation measures, monitoring plan, etc. based on simple field survey as necessary.	Mainly for FS
EIA	Environmental Impact Assessment	Based on detailed field survey, it refers to the level at which alternative plans, detailed prediction and appraisal of environmental impacts, mitigation measures, examination of monitoring plans, etc. are carried out.	Mainly for DED

Chapter 7. What should be described in the FS Report?

The items to be studied in FS are different according to the type of each project⁴. The general contents of the FS Report is generally as shown in the Table 1-8.

Table 1-8: Contents of FS Report (Example)

1) Summary of the Report	
2) Main Text	1) Purpose of the project and Overall Goal (including Beneficiaries)
	2) Background
	3) Stakeholders
	4) Surrounding Conditions
	5) Implementation Schedule
	6) Practicality of the project & Specific Technology, if necessary
	7) Expectable impact to SDG, and benefits
	8) Rough Cost estimate and Economic & Financial Projection
	9) Environment & Social Assessment with Negative Impact * Environmental impact could not be ignored * Especially resettlement becomes important
	10) Findings and Recommendations (with Operation and Maintenance Plan)
3) Attachments	Outline Drawings ^{Note1} -----(Page 14, Table 13 and 14) Implementation Schedule of Project----- (Attachment 1-4) Summary table of Rough Cost estimate -----(Attachment 1-5) Unit Rate, Quantities of Major Item -----(Attachment 1-6) Unit Rate of Similar Project -----(Attachment 1-7) Checklist -----(Attachment 1-1)

Note1 Outline drawings should be attached to measure the quantities for the rough cost estimation

For the reference:

For implementation of the project, land acquisition may be necessary. Principally detailed land acquisition and Resettlement plan belongs to the DED stage. But, if such work is expected to be a large scale, it is recommended to study at the FS stage. In this case, the project owner or the Government is expected to start negotiations with the land user, even if the land use is illegal. It will be classified as shown in the Table 1-9.

Table 1-9: Land Acquisition, Compensation and Resettlement

TARGET AREA	METHOD	REMARKS
Small or a few	Compensation for land, house and garden tree etc.	Demolition fee should be considered
Middle or Large scale	Compensation and/or Resettlement	Compensation plus relocation destination are arranged by the project owner. Decision of relocation destination is sometimes by political arrangement

⁴ Attachment 1-2 shows the examples of classification by the project category

Table 1-10: Detailed Content of the FS Report

	Required Content [] means variable requirement according to the project's content
1) Project Purpose and the Overall Goal	<ul style="list-style-type: none"> • What is the project purpose and the overall goal? • Compatibility with the National Development Plan
2) Background Legal matters /regulation	<ul style="list-style-type: none"> • Background of Project (Why the project is expected?) • Relations with other projects, such as, for oil development, airport, railways project etc. • Who are the beneficiaries? • Relative law or customs, such as tax & custom law, construction law, labor employment law, technical standard & specification, etc.
3) Stakeholders	<ul style="list-style-type: none"> • Brief introduction of the owner of the project and relevant agencies or resident/personnel, about their main function, organization, annual budget • <i>[staff skill level about the maintenances or management]</i> for the implementation and O&M)
4) Surrounding conditions	<ul style="list-style-type: none"> • Topography of Site: <i>[topographical map, contour drawing, if necessary]</i> • Status of ground: <i>[boring log, property of soil quality, bearing capacity of ground]</i> • <i>[Temperature, humidity : average, maximum, minimum of each month, according project]</i> • <i>[Precipitation: daily & hourly maximum, annually flood records, annual raining days]</i>
4-1) Natural condition	<ul style="list-style-type: none"> • <i>[Wind speed, wind direction : maximum & average of each month]</i> • <i>[Tide level : highest sea level, high tide level]</i> • <i>[Damaged area by flood, hurricane, tsunami, earthquake, drought in the past]</i>
4-2) Site condition	<ul style="list-style-type: none"> • Status of land use around the site, existing facilities <i>[building, underground property]</i> • <i>[Securing/procurement condition: lease etc. of required facility of site/camp & land]</i> • <i>[Measures for the sustainability of the project]</i> • <i>[Indemnity for the area, if necessary]</i>
4-3) Similar project records (if any)	<ul style="list-style-type: none"> • <i>[Description of the past similar work: constructed location, facility scale, period, construction method, temporary work methods, contracted Unit Rate, contract type etc.]</i>
5) Implementation Schedule	<ul style="list-style-type: none"> • Recommendable Time schedule up to the project completion • <i>[Construction plan, construction method, temporary work methods]</i> • <i>[Incidental works, related works]</i> • <i>[Detour of access to construction site and during under-construction]</i>
6) Practicality of the project & Specific Technology, if necessary	<ul style="list-style-type: none"> • Feasibility study about the following items to achieve the proposed infrastructure development: <ul style="list-style-type: none"> ✓ Technical feasibility ✓ License feasibility for technical matters (patents etc.) ✓ Resource feasibility ✓ Time Schedule feasibility
7) Rough cost estimation	<ul style="list-style-type: none"> • <u>Rough project cost estimate</u> based on the quantities derived from outline drawings and by the unit rate of major work items, retrieved from the database or experience of similar project
8) Economic & Financial analysis and Expectable benefits	<ul style="list-style-type: none"> • Benefits should be calculated for the Financial and Economic Analysis • Example of project benefits for Economic analysis are shown in the Attachment 1-3 • Net present value (NPV), Cost-Benefit calculations (B/C), and Internal Rate of Return (IRR) • In case of profitable project, Financial feasibility becomes important through the market research studies and Operational feasibility from Expenditure & Revenues becomes necessary
9) Environmental & Social Assessment ✓ Land acquisition & Resettlement ✓ Consultation results with the local community/ Stakeholders	<p>Scope and study methods to be analyzed, range of significant negative impacts based on related Laws and Standards (or guideline etc., if necessary)</p> <p>Environment & Social Impact Assessment should be prepared according to the Environment Basic Law” Decree Law No. 26/2012 of 4 July 2012 and get the license according to the Decree Law No. 5/2011 of 9 February 2011 by classifying the project categories</p> <ul style="list-style-type: none"> ✓ Screenings of Project for the categorization A, B, or C ✓ Monitoring methodology for Categories A & B
10) Findings and Recommendations	<ul style="list-style-type: none"> • Summarize the findings in the Feasibility study • <i>[Recommendable O&M plan]</i>

Chapter 8. What items are required for a field survey?

For implementation of the survey in FS, at first, a project location should be identified on the topographic map /or satellite photo (Google earth photo may be accepted as the worst case).

The following items in the Table 1-10 should be checked before and during the implementation of survey or investigation for FS by using the **checklist, which** is shown in the Attachment 1-1. However, not all items are required for every project. Necessary items for the project should be selected according to the type of the project by sorting the *necessity Rank* as shown the Table 1-11.

Table 1-11: Field survey Items of FS

Category mark	Field survey Items (including by document study)	Page in the report	Necessity Rank
a	Existing Development Plan		5,4,3,2,1
b	Climate survey		5,4,3,2,1
	Hydraulic survey		5,4,3,2,1
	Disaster survey (storm, flood, corruption, erosion, and current countermeasures or alarm system)		5,4,3,2,1
	Geological survey (such as foundation or ground survey etc.)		5,4,3,2,1
	Location survey or topographic survey		5,4,3,2,1
c	Regulations / Design standard		5,4,3,2,1
d	Social conditions before project (such as population, land use etc.)		5,4,3,2,1
	Inventory Survey for exiting available facilities or demolished		5,4,3,2,1
	Utilization status survey (traffic, cargo, vessel number, possible user number)		5,4,3,2,1
	Current issues survey		5,4,3,2,1
	Current revenue, if any		5,4,3,2,1
	Recent budget for the sector		5,4,3,2,1
e	Resource survey (available materials, equipment, labors, facilities or energy with their unit rate, project's owner ability)		5,4,3,2,1
i	Privatization tendency		5,4,3,2,1

LMs and/or Consultant could revise the name of check items and may add /revise in the same category, **but the category mark should be kept to make clear the content of check item in Attachment 1-1.**

Necessity Rank is expected to be categorized into 5 ranks: 5 “very important” to 1 “not essential”

Chapter 9. What items should be studied for a feasibility of the project?

The items in the Table 1-12 should be studied in FS based on the site investigation/survey. LMs are expected to check the study items prior to submission of FS report to MPS/ADN by using the **checklist**, which is shown in the Attachment 1-1. However, not all these items are required for every project. Necessary items are expected to be selected according to the type of the project.

Table 1-12: Items for FS Study

Category mark	Items for FS Study	Page in the report	Necessity Rank
a	Study of Spatial/ Sector plan		5,4,3,2,1
	Consistency with Upper National Plan		5,4,3,2,1
c	Design load and design strength of the object's foundation		5,4,3,2,1
d	Target Area study result (such as features, issues, etc.)		5,4,3,2,1
e	Future demand or necessary capacity		5,4,3,2,1
	Necessary facilities volume and/or numbers etc.		5,4,3,2,1
	Ancillary facilities (such as warehouse or equipment)		5,4,3,2,1
	Location or route selection or Distribution methodology of the products		5,4,3,2,1
	Design scale of each facilities (such as height, level or depth etc.)		5,4,3,2,1
	Approach measures to the object (such as roads or railways)		5,4,3,2,1
	Quantities for Major Items Project Cost / Necessary construction period		5,4,3,2,1
	Necessary resources or energy (such as aggregate, cement, steel, skilled labor, electric power supply, water, owner's ability etc.)		5,4,3,2,1
f	E & F analysis		5,4,3,2,1
g	Influence of the project to the surroundings, including IEE, Resettlement etc.		5,4,3,2,1
h	Beneficiaries		5,4,3,2,1
i	Future extension plan, if necessary		5,4,3,2,1
	Alternative proposal (such as location or routes or methodologies)		5,4,3,2,1
j	Countermeasures for the disasters, waste or emission		5,4,3,2,1
	Operation and Maintenance plan (O&M)		5,4,3,2,1

LMs and/or Consultant could revise the name of check items and may add /revise in the same category, **but the category mark should be kept to make clear the content of check item in Attachment 1-1.**

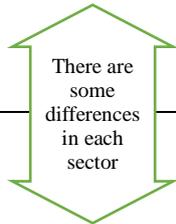
Necessity Rank is expected to be categorized into 5 ranks: 5 “very important” to 1 “not essential”

Chapter 10. What are the minimum drawings to be prepared?

The following types of the Outline drawings in the Table 1-13 are required to attach to the FS Report as the base of grasping the project outline, and quantity survey for the rough cost estimation.

Table 1-13: Outline Drawings in FS

	Drawing name	Remarks
Civil works	(1) Location map	* Drawing showing physical relationship of project area and construction location in topographical map
	(2) General plan	* Drawing showing total idea plan
	(3) Typical cross section	
	(4) Longitudinal cross section	
	(5) Facility plan	* Recommendable Facilities Installation plan, and alternatives (comparative plan) in topographical map * Important incidental Facilities plan
Architectural Works	(1) Location map	* Drawing showing physical relationship of project area and planned faculties in topographical map
	(2) General Plan	
	(3) Layout plan	* Drawing showing the arrangement of facilities in the project area
	(4) Typical cross section	
	(5) Elevation view	
	(6) Facility plan	* Diagram figure which shows concept of system of facilities
(Appendix)	Soil boring log etc.	* It is used for decision of foundation structure and be attached to the investigation report



Expected Scale of the Drawings as shown in Table1-14:

Table 1-14: Expected Scale of Drawing in FS

Type	General contraction scale from the examples in the past
General plan	Range scale 1/1000~5000 Scale 1/10000-50000 might be used in large scale facilities
Facility layout plan	Range scale 1/1000-5000 Scale 1/10000-50000 might be used in large scale facilities
Plan, Cross section, Longitudinal cross section	Range scale 1/1000~5000 Scale 1/10000-50000 might be used in large scale facilities * Larger scale might be used in case of water supply conduit, line, electric grid etc. * The different scale might be used for horizontal and vertical cross section in case of cross section and longitudinal cross section view
General structural drawing	Range scale 1/500-1/5000 to make clear the structural main size, part's thickness and material quality

Please see the column of calculation basis in the Attachments 1-8 & 1-9.

Note: Above scale is 10 times less comparing to the best practice, but in Timor Leste it is possible to use bigger scale as shown in the above Table 1-14 for the time being. Different scale can be applied according to the type of the project (see the Attachment 1-8& 1-9).

Chapter 11. What methods are required for rough cost estimation in FS?

(1) or (2) methods of Table 1-15 are the most popular for the Cost estimation in case of FS.

Table 1-15: Cost estimation methods

Methods	Overview	Remarks
(1) Rough Cost estimate methods by the past contract result (Total sum method)	<ul style="list-style-type: none"> Analyzing statistically the past contract cost data for each kind of facilities or structures considering their recent tendencies as shown below: <ul style="list-style-type: none"> [\$ x0000,00 / school] [\$ x0000,00 / bridge] [\$ x0000,00 / road km] [\$ x0000,00 / irrigation area ha] 	<ul style="list-style-type: none"> This method is useful to know the total project cost roughly to secure the budget It is important to collect the past project data as much as possible and analyzing them to keep in the data base
(2) Contracted Pay Item (Unit Rate method)	<ul style="list-style-type: none"> To execute the Rough Cost estimate about the major pay items based on the unit rate of the past actual contract of the similar project, considering location, current construction conditions, and market prices tendencies 	<ul style="list-style-type: none"> Estimation based on the actual contracted Unit Rate (actual value in the past). This cost estimation results shows most practical one It is necessary to confirm that the unit rate includes the indirect cost, and should be adjusted the unit rate, if the indirect cost is included
(3) Estimate collection method	<ul style="list-style-type: none"> Collect the necessary unit rate estimates from the consultants, contractors and suppliers. The Rough cost could be calculated by utilizing the unit rate and the quantities picked up from the prepared drawings 	<ul style="list-style-type: none"> It is not easy to collect reliable estimates about necessary all items, and other methods may be used simultaneously
(4) Built-up cost estimation method or Unit rate breakdown method	<ul style="list-style-type: none"> 1st; Prepare Unit Rate of each pay item's composed of labor cost, material cost, equipment depreciation cost 2nd: Pick up quantities based on drawing. 3rd: Prepare each productivity, and calculate numbers of necessary labor and equipment 4th: To calculates each pay item's cost by multiplying unit rare and quantities or numbers about all of kinds of construction pay items 5th: Summary up to get total project cost 	<ul style="list-style-type: none"> This is most reliable method applied to Detailed Design Study Unit rate table of each pay items could be introduced from other developed countries by adjusting productivity, if the market of construction work is in immature status to collect basic data

Note: More detailed breakdown of the cost estimation may be requested in FS as the best practice.

The following Table 1-16 presents the example of expected range of cost and methodology.

Table 1-16: Expected Accuracy of Cost estimate

TYPES OF ESTIMATION	EXPECTED ACCURACY RANGE	METHODOLOGY	REMARKS
Project Concept	-20% ~ -50% to +30% ~ +100%	Analogy, or Judgment by the experience	Please refer method (1)
FS	-15% ~ -30% to +20% ~ +50%	Analogy methods from the past project	Please refer method (1) or (2)
DED	-5% ~ -15% to +5% ~ +20%	Detailed Cost by BoQ and Unit rate breakdown of Consultant	Please refer method (4)
Contract	-3% ~ -10% to +3% ~ +15%	Detailed Cost by BoQ and Unit cost breakdown of Contractor	

Chapter 12. What is the content of TOR for FS?

TOR is a technical requirement for the Consultants to execute FS. Executing Agency should prepare TOR for the implementation of FS based on this Guideline (with the help of independent expert, if necessary) and under the consultation with ADN and MPS (if necessary) to formulate the Project Concept. TOR for FS bidding should specify followings information, presented in the Table 1-17 (Model TOR is in the Attachment 1-13).

Table 1-17: Structure and Contents of FS TOR

1. Project Purpose	What is requested to the project?	- brief overview of the project; - project area (location) and scale;
	What should be solved by this project?	- Current problem to be solved
	Who are the beneficiaries?	- numbers of beneficiaries
2. Project Background	Who is the Responsible organization? Why initiates the project?	Political decision or Based on Upper Plan or Related regulations or law Project environment or special conditions General support by the Employer
	What is in background?	
3. Scope of FS	What should be achieved by FS?	Itemized the requests necessary for the implementation of the process.
	What should be studied and clarified?	
	What is expected outcome/output?	
4. Assignment of Experts <i>Note</i>	How many months are allowed for FS?	Required number of experts involved, with their profession, education, experience, skills, Location of assignment, logistic, etc.
5. Reporting Requirements	Language, Work content	(References and Documentation list related to project)
	Kinds, numbers and time limit	
	Administrative Arrangements	
6. Outline of the Project	The details of Project contents are recommended to be attached excluding estimated project cost	

Unique Point

Note:

Assignment of Experts is a major part of TOR in case of conventional TOR. Especially in case of TOR for “DED and Construction Supervisory Works”, because they are necessary to estimate design or construction supervisory cost, which is usually prepared based on the FS study.

However, the Assignment of Experts for FS is different, because it is difficult to define the appropriate number of necessary experts based on the scope of works of FS that is not so clear comparing with the DED or Construction. Therefore, the Employer may request the outsource or in-house Consultant to prepare TOR for FS that gives an advantageous for the Consultant to receive the DED or Supervision.

Assignment of Experts for FS TOR is recommended to be attached just as an example. But it is better to be proposed as a technical proposal of the Consultants during the bid within the maximum budget of the employer side as shown in the Sample TOR in the Attachment 1-13.

Chapter 13. What is the difference between FS and DED?

There is a common question about the difference of TOR between FS and DED. FS covers wider range of survey and study comparing to DED. On the other hand, DED requests a specific detailed scope necessary for the implementation of the actual construction (see p. 1-3). The following Table 1-18 shows the difference of the content of FS and DED. DED should be conducted after the government decision about the project budget based on the FS results.

Table 1-18: Difference of the content of FS and DED

	Feasibility study (FS)	Detailed design study (DED)
Investigation	Maximum utilization of the past available data is expected for topographic map, ground data (boring data is unavailable usually), weather data, traffic data, development plan, demand forecast, if possible	Actual survey is essential: Topographic survey, Geological survey, River flow survey, Traffic survey, Population growth survey and Future commodity tendencies etc.
Environmental assessment	Initial Environmental Examination (IEE) including natural and social impact	Environmental Impact Assessment (EIA) with land acquisition and resettlement
Study	Legal basis, Project Benefit, Site suitability	Best option for implementation of the Project
Drawings	Outline Drawing (minimum followings) Location map General plan or Arrangement plan And, Facility plan or Typical cross section, if necessary	Detailed Drawing Drawings showing accurate size for each work
Quantity list	Principal quantity list for major works	Detailed calculation list of each work and materials from the detailed drawings
Construction Schedule	Total project schedule	Detailed work schedule showing critical path
Work efficiency table	(none)	Work efficiency for each work items about labor and equipment is necessary Work efficiency means the daily/hourly output, which will be decided by the construction period and by the past data This is affected by the local conditions and construction schedule
Unit rate list	Example for main products * Road /km, Bridge /m2 or per one bridge, * Building /m2 or per a school, * Power /MW, * Water supply /m3, * Irrigation /ha	Detailed list of each pay items based on the latest market price about materials, equipment & labor cost
Estimates	Rough cost	Detailed cost based on the built-up estimation $\text{Cost} = \frac{\text{Quantity}}{\text{Work efficiency}} \times \text{Unit rate}$
Output	FS Report with necessary attachments	DED Report with detailed cost estimation and Bid Document, such as Special Condition of Contract, Special Specification, BOQ, Drawings, Instruction to Tenderer, etc.

Note: Required accuracy of Cost estimate is shown in the Table 1-16.

Chapter 14. What is the difference between the Preliminary Study, PFS and FS?

In General, the process project preparation and appraisal for construction is shown in the Figure 1-8. And various types of documents should be prepared.

First Step

Master Plan M/P is “Outline plan” in the spatial / sector planning including phasing and recommendation of “Priority Project”. In case of huge project, such as area development, airport, port project, M/P will be required to decide priority projects in the M/P and their phasing.

Second Step

Preliminary Study done for the Project Formulation and Assessment to define the project scope through the site survey, to identify the focus areas & direction, to take for the subsequent preparatory study and to determine and draft out ultimate policy options. Some of the study results are used for the Project Concept.

Various terms are used for the documents in this stage, such as Preparatory study, Preliminary study, Pre-Feasibility study, Outline study, Feasibility Study, Basic design study etc. The exact definition of these deference is not an easy, because the assessment process of the project is variable according to each project’s background.

Pre-Feasibility Study PFS looks like a type of FS, but principally PFS is not FS. PFS is used generally to the following different character studies:

1. If the Project Concept is not clear and several alternative plans are assumed. PFS is implemented to study the optimum plan to transfer to FS. (it closes M/P than FS).
2. If the Project Concept covers large scale of contents, PFS is implemented first to select the priority or to decide the most appropriate process to limit the scope of works of FS.
3. In case of the project with the heavy burden against the country budget, support from overseas agencies could be expected. PFS report is desired as a basic attachment to the request letter to the overseas agencies. The overseas agencies will decide whether to support the requested Project based on their own standards of the implementation of FS. It is carried out in a simplified manner comparing with general FS.

Third Step

Feasibility Study FS is prepared prior the actual funding stage to confirm the feasibility of a specific project selected in the Master Plan (M/P) or upper plan.

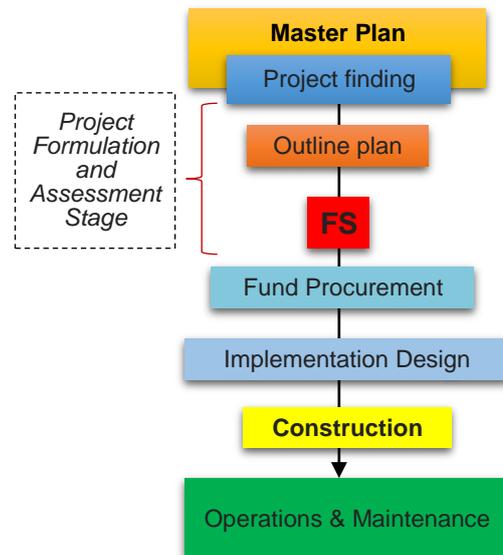


Figure 1-8: Project Process

Chapter 15. What is the difference between FS and Ex-Ante Evaluation?

The Feasibility Study and Ex-Ante Evaluation (Pre-implementation Evaluation) are similar on the point of view to appraise before the project implementation. The comparison is between FS and Ex-Ante Evaluation is shown in the following Table 1-19.

Table 1-19: Difference between FS and Ex-Ante Evaluation

	Feasibility Study	Ex-Ante Evaluation
Purpose	To identify problems that can be anticipated in project implementation and examining their countermeasures.	To appraise project investment effects and project implementation situations
Work contents	FS is one of the stages to implement a project to analysis about the project concept contents, such as project site conditions, surrounding natural conditions etc.	It is just checking of the contents of the project through the documentation and hearing without special study work.
Person in charge	Usually executed by selected Consultant nominated through tender	Government officer (or specific consultant)

The main items required in the report in FS and vie points in Ex-ante evaluation are different. The detailed description and the difference is presented below in the Table 1-20.

Table 1-20: Difference of the Required Items of FS and Ex-Ante Evaluation

Items required in FS Report	Viewpoints in Ex-Ante Evaluation
1) Project Purpose and Overall Goal	
2) Background Legal matters /regulation	Relation with higher level plan
3) Stakeholders	Consensus from the local people (Who are Direct beneficiaries?)
4) Surrounding conditions 4-1) Natural condition 4-2) Site condition 4-3) Similar project records (if any)	Reduction of natural disasters Reduction in accidents and disasters Utilization of local resources Stabilization of local communities Promotion of local culture Relationship with another Project
5) Implementation Schedule	Technical difficulty
6) Practicality of project & Specific Technology	
7) Rough cost estimation result	Cost-Benefit analysis
8) Economic & Financial analysis and Expectable benefits	Profitability (if Project could charge some fee)
9) Environmental & Social Assessment 9-1) Land acquisition & Resettlement 9-2) Consultation results with local Stakeholders	Status of legal procedures Impact on community life Expansion of production Increase in employment Conserving the living environment Conserving the natural environment Improvement of landscape
10) Findings and Recommendations	

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Attachment 1-1: Checklist for Survey/ Investigation and Study

Target project in this check sheet is:

Show the figures in Attachment 1-2 of this Guideline

Report page number or chapter number shall be filled by Consultant

(Categories of the Project) Please refer example list in the Attachment 1-2

Items to be surveyed and studied for the formulation of FS ("a-j" are category mark in Chapter 9 and Chapter 10)	Necessity Rank	Report page/ Chapt	Checked by LM	Date	Checked by MPS
a) Existing Development Plan					
a) Study results of Spatial/ Sector plan					
a) Consistency with Upper National Plan					
b) Climate survey					
b) Hydraulic survey					
b) Disaster survey (storm, flood, corruption, erosion, and current countermeasures or alarm system)					
b) Geological survey (such as foundation or ground survey etc.)					
b) Location survey or topographic survey					
c) Regulations / Design standard					
c) Design load and design strength of the object's foundation					
d) Social conditions before project (such as population, land use etc.)					
d) Inventory Survey for exiting available facilities or demolished					
d) Utilization status survey (traffic volume, cargo, vessel number, possible user number)					
d) Current issues					
d) Current revenue, if any					
d) Recent budget for the sector					
d) Target Area study result (such as features, issues, etc.)					
e) Future demand or necessary capacity					
e) Location or route selection or Distribution methodology of the products					
e) Necessary facilities scale and/or numbers etc.					
e) Necessary ancillary facilities (such as warehouse or equipment)					
e) Design scale of each Project facilities (such as height, level or depth etc.)					
e) Approach measures to the object (such as roads or railways)					
e) Quantities for Major Items, Project Cost and Necessary construction period					
e) Resource survey results (available materials, equipment, labors, facilities or energy with their unit rate, project's owner ability)					
f) Economic & Financial analysis results					
g) IEE, Resettlement etc., including Influence of the project to the surroundings					
g) Social Impact Analysis					
h) Benefit & Beneficiaries, stakeholders					
i) Future extension plan, if necessary					
i) Alternative proposal (such as location or routes or methodologies)					
i) Privatization tendency					
j) Countermeasures for the risks, such as disasters, waste or emission					
j) Operation and Maintenance plan (O&M)					
Drawings prepared in FS (Consultants may add drawing list, if necessary) see Part 1 - Chapter 11	Necessity Rank	Report page /chapt	Checked by LM	Date	Checked by MPS
1) Location map					
2) General plan					
3) layout Plan					
4) Typical Cross section					
5) Facility Plan					
Quantity, Unit Rate of major Item & Construction Period in FS	Necessity Rank	Report page	Checked by LM	Date	Checked by MPS
6) Quantity and Unit Rate of Major Items					
7) Construction Schedule and Period					
Expectable Benefit (qualitative and quantitative) (refer Part 1- Attachment 3)	Necessity Rank	Report page	Checked by LM	Date	Checked by MPS
8) Direct Benefit (refer Attachment 1-3)					
9) Indirect Benefit					

Consultant should put his idea about necessity rank.
i.e 5: very important, 4: important, .3: desirable, 2: not important, .1: ignorable

Items in each category could be added/ revised based on the project status, but not be deleted.

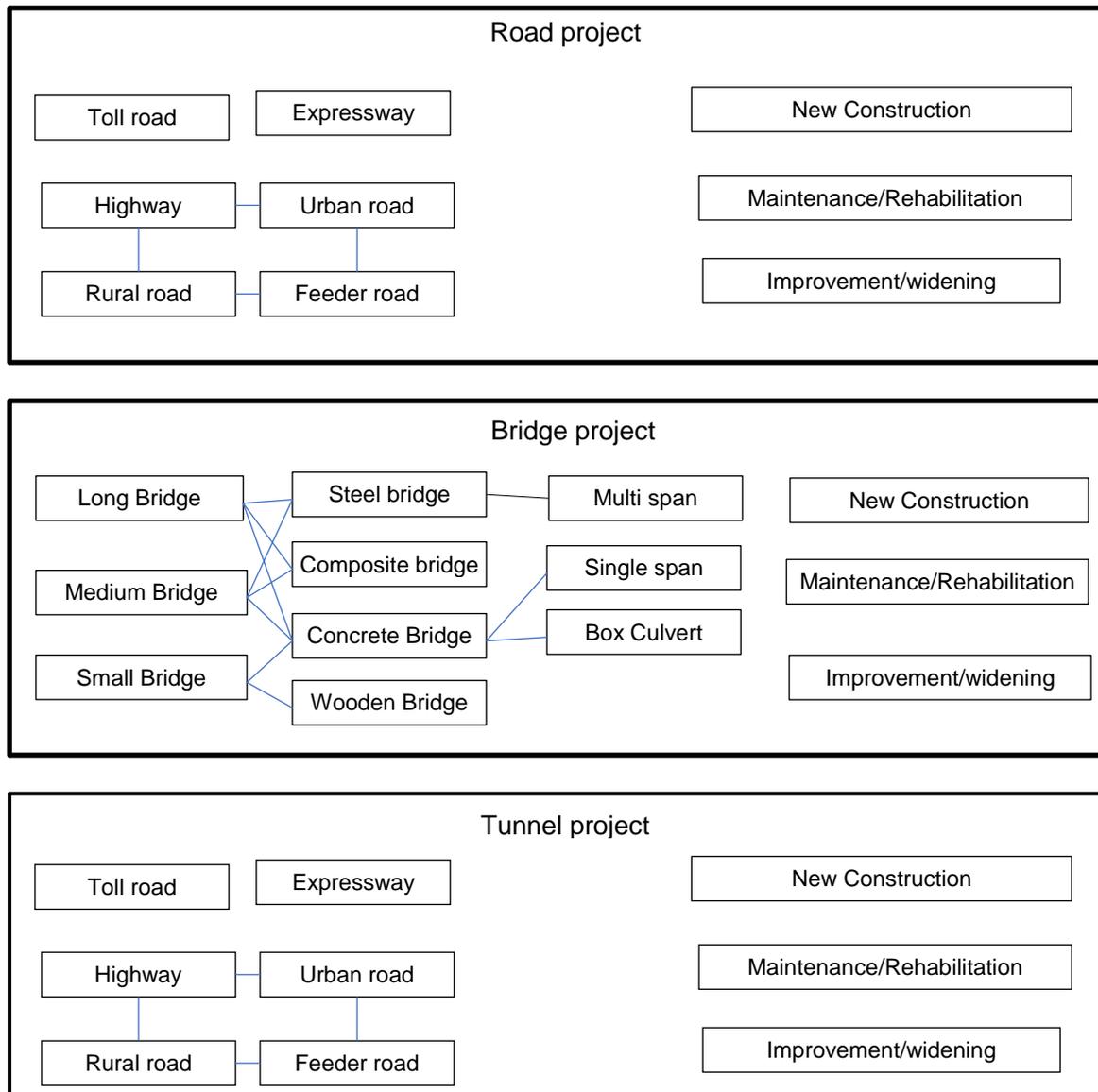
Necessary drawings are different according to the Project

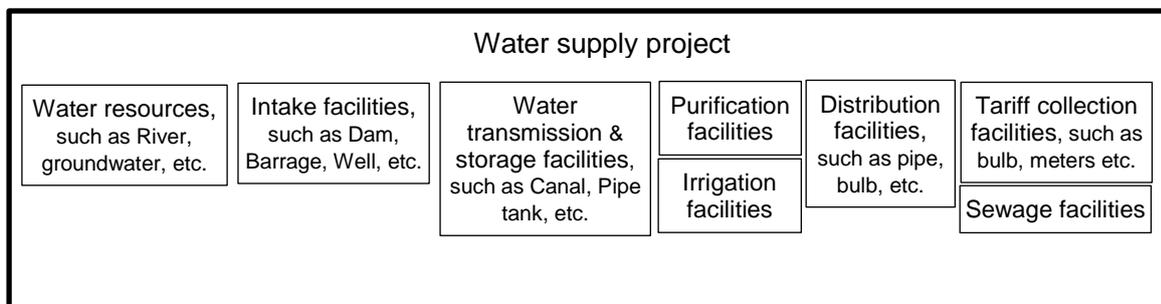
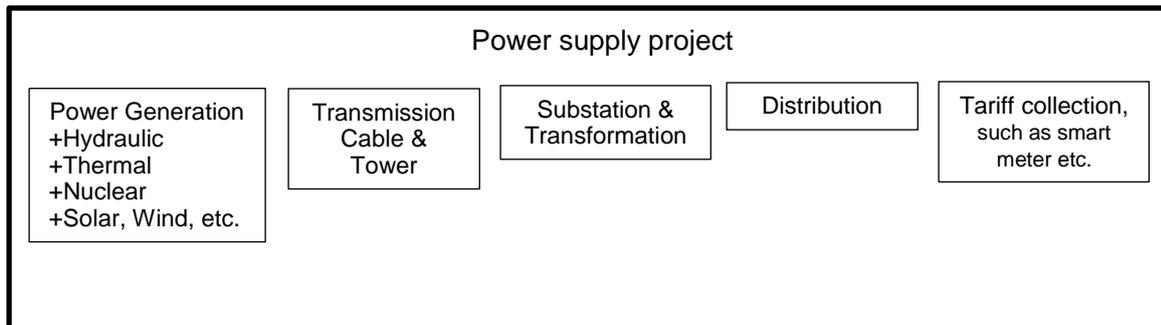
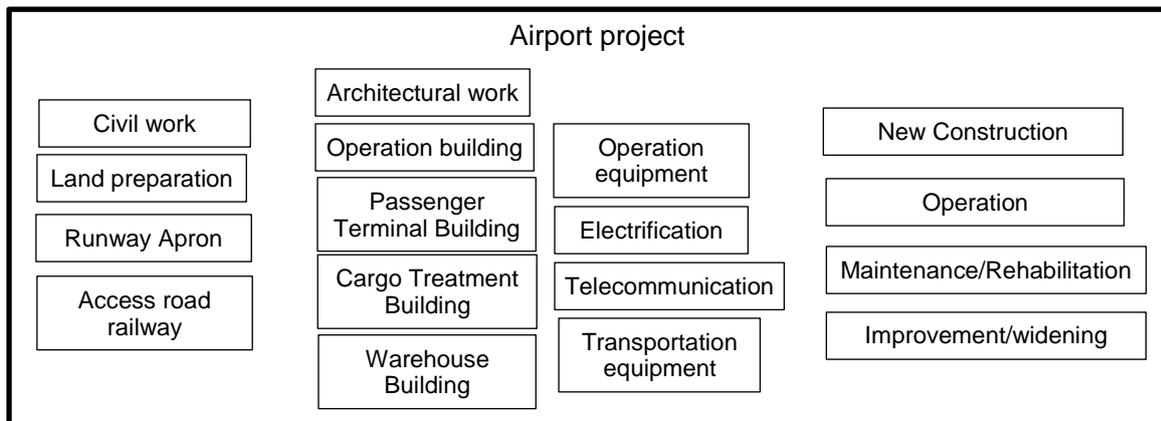
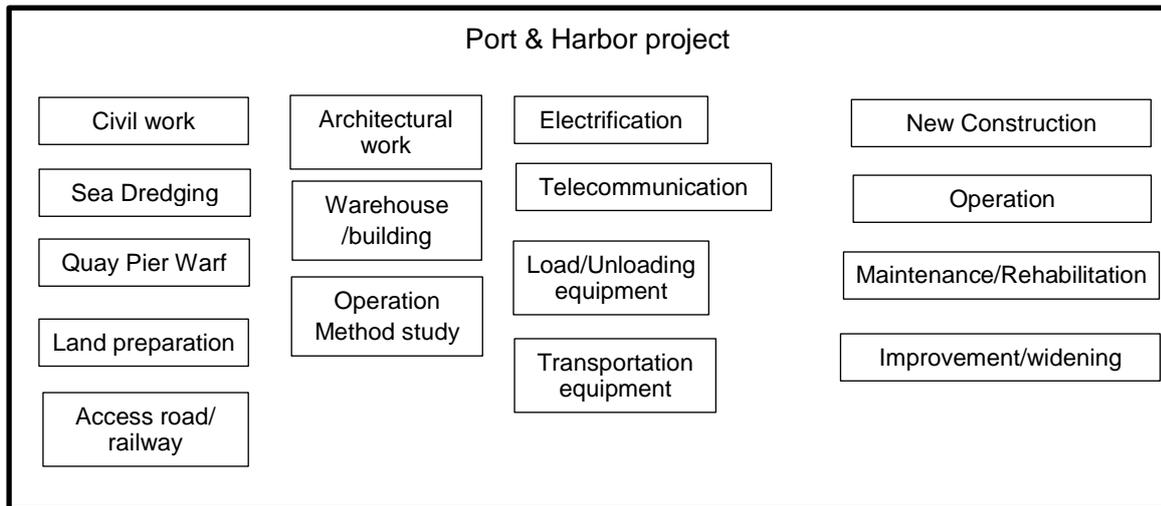
This Checklist is the most important to make easy FS evaluation, and Consultants may put additional pages, if necessary

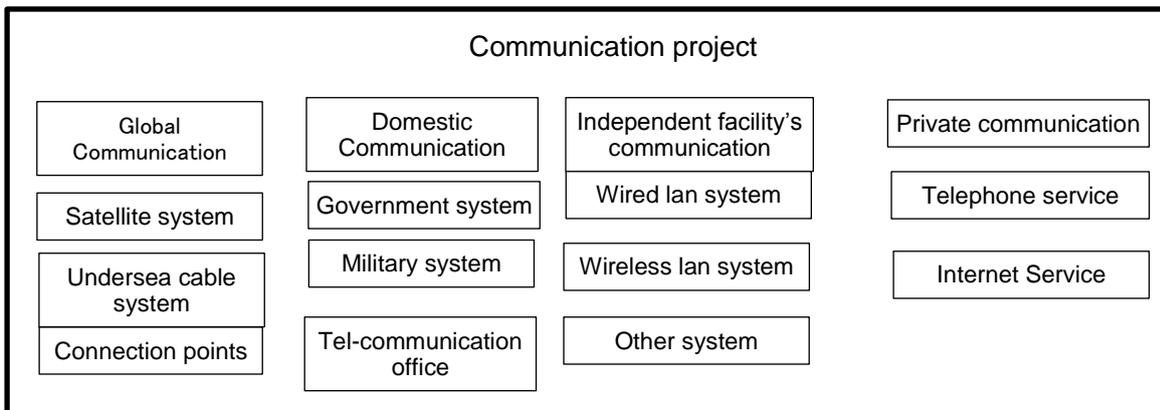
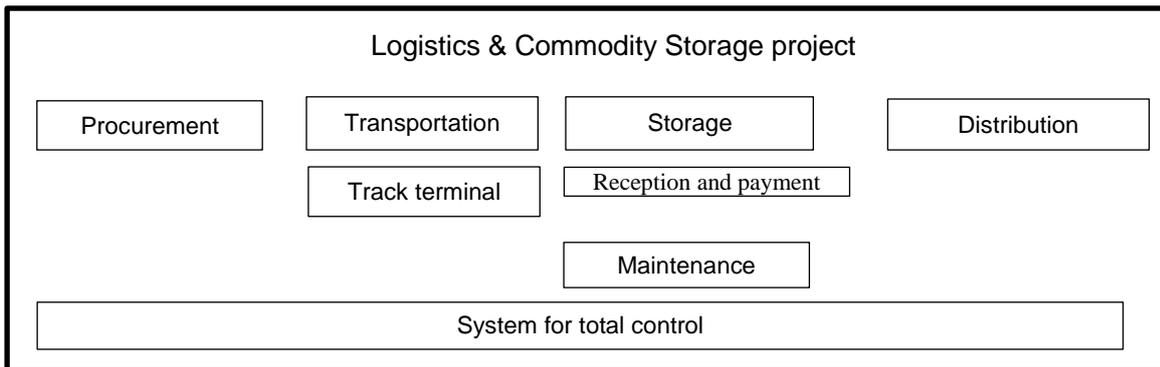
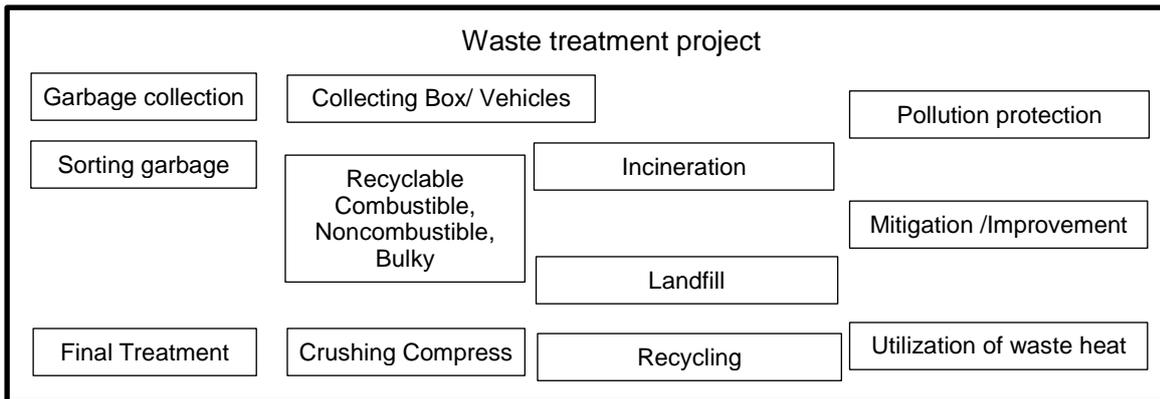
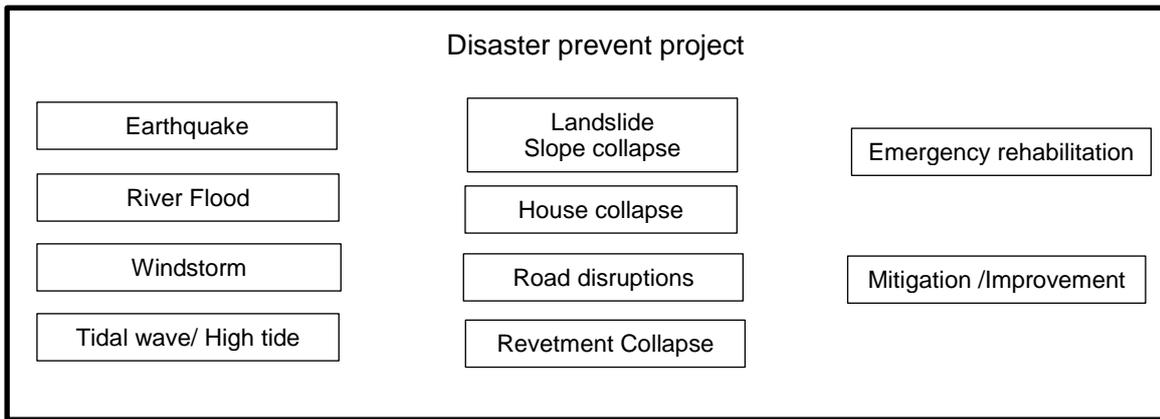
Attachment 1-2: Project type for different sectors

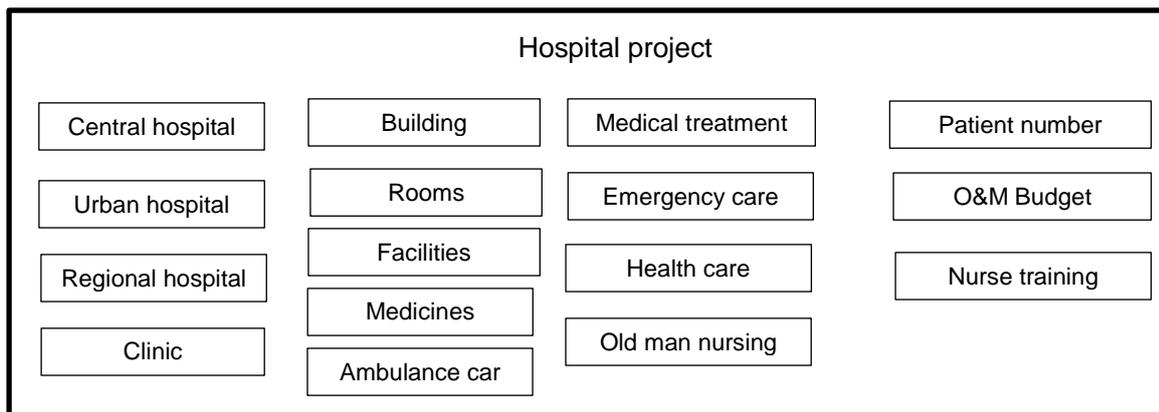
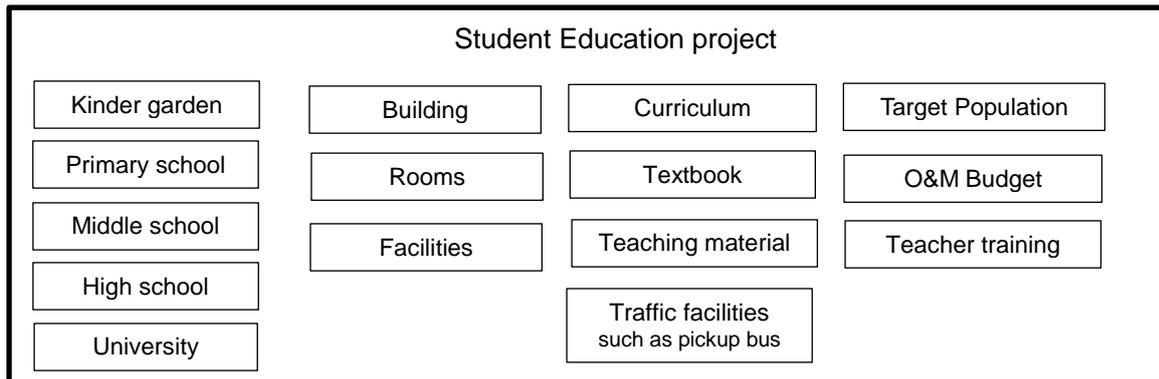
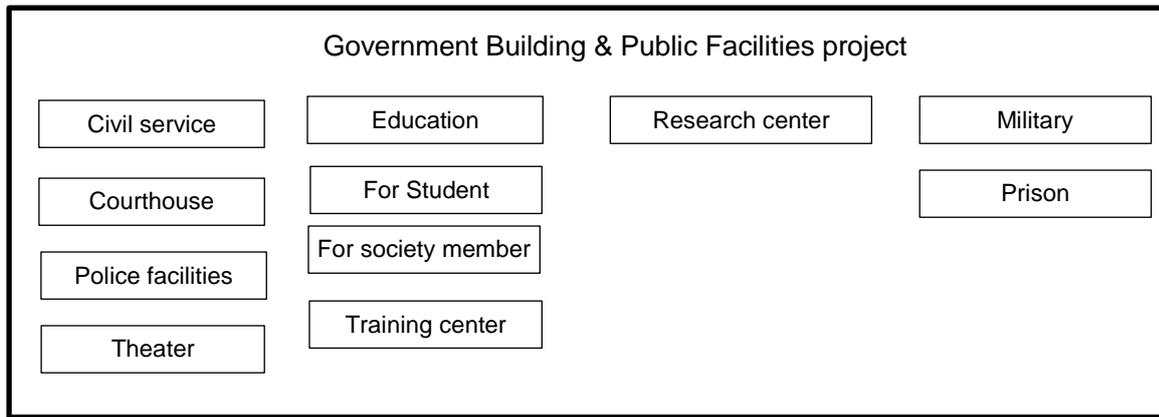
The following figure should be on the top of the **checklist** to show the type of project.

These categorizations are expected to be used as key words and help to find similar project in data base. And LMs are expected to attach this project classification on the top of the **checklist** to show the project type.









Attachment 1-3: Example of Project Impact & Benefits for Economic Analysis

Please refer also Appendix 2-4 Quantifiable economic benefits (p.2-57) of FS Guideline Part 2.

Project type	Type of benefit	Benefit item	Tangible benefit	Tangible benefit, but due to the project type	Difficult to utilize as the tangible benefit	
Road Project	User benefit	Cost saving effect for vehicle running	○			
		Time cost saving effect	Passenger	○		
			Cargo		○	
		Saving effect for maintenance cost etc.	○			
		Induced traffic benefit		○		
		Safety effect increase (Reduction of Traffic accident)		○		
	Ripple effect	effect increases for comfort • convenience				○
		Environment impact		○		
		Area development effect			○	
Urban traffic project	User benefit	Vehicle running cost saving	○			
		Operation cost saving	○			
		Time cost saving	Passenger (business trip)	○		
			Passenger (out of business trip)		○	
			Cargo		○	
		Saving of maintenance cost etc.	○			
		Induced traffic benefit		○		
	Safety increase (Traffic accident reduction)		○			
	Ripple effect	Increase of comfort/convenience				○
		Reduction of environmental contaminate materials (Reduction of air pollution by Exhaust gas)			○	
Area development effect					○	
Railway project	User benefit	Time cost saving effect	Passenger	○		
			Cargo	○		
		Running cost saving effect	Passenger	○		
			Cargo	○		
		Maintenance cost saving effect	○			
	Safety effect increase		○			
	Ripple effect	Effect increase of comfort/convenience (punctuality, operation frequency)				○
		Induced traffic effect		○		
Environment impact			○			
		Area development effect			○	

Airport Project	User benefit	Travel time saving effect	Business trip	○			
			Other trip	Partially tangible			
			Travel cost saving effect		○		
			Cargo/transportation cost • time saving effect		○		
			Safety increase			○	
		increase of comfort/convenience (operation frequency) • assurance (punctuality)				○	
	Ripple effect	Induced traffic effect			○		
	Environment influence (mainly noise)			○			
	Area development effect				○		
Port Project	User benefit	Saving benefit of transportation cost		○			
		Benefit by reducing of transportation time		○			
		Cost saving of maintenance for alternative transportation means etc.		○			
		Safety increased effect (reduction of maritime accident, safety improvement of anchorage)			○		
		increased effect of comfort/convenience				○	
	Supplier benefit ¹⁾	Trans-shipment effect			○		
	Ripple effect	Environment impact			○		
	Area development effect				○		
Note ¹⁾ : trans-shipment user is sometimes foreign registry one, and usually benefit is counted by Port fee revenue (supplier benefit)							
Ground water development Project	Cost Reduction (for current water supply volume)	Cost saving for current alternative water supply		○	.	.	
		Mitigation for drawing water time etc.					
	Increased water supply volume	Payment-will amount by the user against increased water usage		○	.	.	
	Damage avoidance	Avoidance of Water outage or Water reduction damage by the stable water supply			○		
	Public health Improvement effect	Mitigation effect for the human health damage due to plague occurrence prevention			○		
	Productivity Improvement	Increase of agricultural production etc.			○	.	
	Life environment Improvement effect	User life environment Improvement				○	
Other effect	Tourism project acceleration effect			○			
	Land use effect etc.				○		

Water supply Project	Cost Reduction (for the current water supply portion)	Cost saving for current alternative water supply	○		
	Increased water supply volume	Payment-will amount by the user against increased water usage	○		
	Resource Conservation Effect	Savings effect of Resource (Water resource conservation due to deduction of water leakage etc.)	○		
	Damage avoidance	Avoidance of water outage or water reduction damage due to the stable water supply		○	
	Public health Improvement effect	Mitigation effect for the human health harm due to plague occurrence prevention		○	
	Life effect by environment Improvement	Improvement of user life environment			○
	Other effect	Effect for the Acceleration of tourism Land use effect etc.		○	○

Sewage Project	Cost Reduction effect	Reduction of Human urination treatment cost of sewage by the current processing method	○		
		Reduction of water supply treatment cost by improving the water resource quality		○	
	Productivity increased	Increasing of Agricultural and Fishery productivity		○	
	Water damage Mitigation effect	Avoidance of water hazard damage amount by the Stagnation of internal water		○	
	Public health Improvement effect	Mitigation effect for the human health damage due to plague occurrence prevention		○	
	Environment conservation effect	Resource saving effect (Reusing of treated water)	○		
		Reduction effect of environment contaminated materials		○	
	Living effect by environment Improvement	User's living environment Improvement (sewage exclusion)			○
	Land use effect	Rising of land value by the improvement of land use			○
Other effect	Acceleration effect of Tourism/Recreation project		○		

Waste management Project	Reduction effect of treatment cost	Cost saving effect	○		
	Production volume increase	Revenue effect due to Project	○		
	Life environment conservation effect	Waste exclusion effect (comfort increase)			○
	Public health Improvement effect	Bad smell reduction & harmful insect effect, Plague Occurrence Prevention effect, human health harm mitigation effect		○	
	Environment conservation effect	Reduction effect of environment contaminated materials		○	
		Reduction effect of the final treatment volume		○	
		Reduction effect of related substances for global warming		○	
	Other effect	Residents' awareness enlightenment effect			○
		Former site use effect, Tourism/Recreation project acceleration effect		○	
		Area development effect			○
Flood control & Erosion control Project	Direct damage Mitigation effect	Mitigation of general property damage (Mitigation of property damage, such as house, factory, shop, office building etc.)	○		
		Damage mitigation of agricultural products, livestock products, fishing products	○		
		Damage mitigation of Public civil engineering facility etc.	○		
	Indirect damage Mitigation effect	Damage Mitigation of human life		○	
		Damage mitigation of suspension of business		○	
		Cost saving for emergency measures		○	
		Mitigation of traffic block off damage		○	
	Ripple effect	Mitigation of Ripple damage			○
		Mitigation of Mental damage			○
		Environment impact		○	
	Area development effect			○	

Earthquake hazard mitigation Project	Direct damage Mitigation effect	Mitigation of general property damage (Mitigation of property damage, such as house, factory, shop, office building etc.)	○		
		Damage Mitigation for public civil engineering facility etc.	○		
	Indirect damage Mitigation effect	Damage Mitigation of Suspension of business		○	
		Cost saving for Emergency measures		○	
		Mitigation of traffic block off damage		○	
		Mitigation of ripple damage			○
	Ripple effect	Mitigation of mental damage			○
		Environment impact			○
	Area development effect			○	

Education Project	Personnel	Ability Improvement (Literacy rate, Learning ability etc.)			
		Acquisition of techniques necessary for life, Learning of Social experience			○
		Personal income increase (Lifetime wage increase)		○ ^{Note}	
	Social	Productivity Improvement			
		Standard of living Improvement (Health and sanitation standards, decline of infants Mortality rate, Decline of birthrate)			○
		Cost Reduction by disparity correction and avoidance of regional conflict etc.			○
		Inheritance of Culture, Values & Social development			○
^{Note} : On economic evaluation, social productivity improvement effect is measured by the increase of personnel lifetime wage					

Attachment 1-4: Form of Implementation Schedule

Construction schedule should be shown in a simple form for each major work item as shown below:

Table: Sample of Implementation Schedule

	<i>M</i>																
Preparation	█																
Work item 1		█															
Work item 2			█														
Work item 3					█												
Work item 4									█								
Clearing-up																	█

Prepared by	Checked by	Appraisal by
Consultant name	Ministry & Department	MPS
Person name	Person name	Person name
Signature	Signature	Signature
Date	Date	Date

Important!

This table is expected to attach on the bottom of following documents:

- Outline drawing
- Implementation schedule
- Summary table of rough cost estimates
- Unit rate of Major Items
- Unit rate of similar project
- Check sheet

Attachment 1-5: Sample Summary Table of Rough Cost estimate

<i>Project name</i>	<i>Ministry name</i>	<i>Consultant Name</i>	<i>Date</i>
Water supply			

No	Items	Amount	Remarks	Checked by	Date
[1] Initial cost	1. Case 1 Civil works construction cost				
	1) Construction net cost				
	(i) Direct Construction Cost				
	Intake facilities	\$2,000,000-	Q=200,000m3/day		
	Purification Plant	\$4,000,000-	Q=200,00003/day		
	Water Pipe	\$20,000,000-	L=8km D=2000 Steel Pipe incl. tunnel		
	(ii) Indirect Common works cost	\$5,000,000-	(i)x X% + actual necessary cost		
	(iii) Site administrative cost	\$2,500,000-	((i)+(ii)) x Y%+ actual necessary cost		
	*Subtotal	\$33,500,000-			
	2) General and administrative costs etc.	\$1,500,000-	((i)+(ii)+(iii)) x Z%		
	*total	\$35,000,000-			
	1. Case2 Architecture construction cost				
	1) Construction net cost				
	(i) Direct Construction Cost=Building		300m2		
	(ii) Common works		(i)x X% + actual necessary cost		
(iii) Site administrative cost		((i)+(ii)) x Y%+ actual necessary cost			
*Subtotal					
2) General administrative cost		Subtotal x H%			
*total					
2. Design supervision					
(1) Design cost	\$2,800,000-				
(2) Supervision	\$2,100,000-	24months			
*total	\$4,900,000-				
3. Soft component costs					
(1) Soft component costs		Nil	Breakdown cost.		
*total		Nil			
4. Necessary Cost for LMs					
Project administrative cost					
*total	\$3,000,000-				
5. Preparation, cost					
(1) Land acquisition costs	\$1,000,000-	Approximate cost			
(2) Compensation cost	\$1,000,000-	Ditto (the same)			
(3) Demolition	\$300,000-	Ditto (the same)			
*total	\$2,300,000-				
*Grand total	\$45,200,000-				
[2] O & M Cost	1) Administration cost for 30 years	\$600,000-	20,000-/year		
	2) Maintenance cost (First 10 years)	\$3,500,000-	Subtotal construction cost x 1%/year		
	3) Maintenance Cost (Second 10 years)	\$10,500,000-	Subtotal construction cost x 3%/year		
	4) Maintenance Cost (Third 10 years)	\$17,500,000-	Subtotal construction cost x 5%/year		
	*total	\$32,100,000-			

Prepared	Checked	Appraised
Consultant name	Ministry & Department	MPS
Person name	Person name	Person name
Signature	Signature	Signature
Date	Date	Date

Attachment 1-6: Unit Rate List for Major Items

Major Work items should be described as shown below:

	Major Item name	Unit	Rate	Amount	Remarks
Similar Project Name		km			
AAA		m			Pavement thickness? cm
		m			

	Major Item name	Unit	Rate	Amount	Remarks
Similar Project Name		km			
BBB		m			Pavement thickness? cm
		m			

Example of Analysis of Unit rate

Project Name: Upgrading and maintenace of Dili (AP junction) – Tibar Section 2 Tasitolu–Tibar

Contract date: Sep 2016

Contract No: ICB /032/MPWTC –2015

Contractor: China Wu Yi Co. Ltd

Project Brief: Conecting Tibar and Tasitolu by opencutting the moutains

Length **4.55** km 4 Bridges 7+5+7+26m

Width (4lanes): **18** m

items	Quantity		Amount		unit rate/m	unit rate/m3 or/m2	
General requirement			440,308	3%	97 \$/m		
Removal work			96,718	1%	21 \$/m		
Earth work (fill)	288,218 m3	63 m3/m	2,541,216	20%	559 \$/m	8.8 \$/m3	
(excavation)	11,487 m3	3 m3/m	46622	0%	10 \$/m	4.1 \$/m3	
subbase	80,500 m2	41,521 m3	808,829	6%	178 \$/m	10 \$/m2	19.5 \$/m3
& base	80,500 m2	21,900 m3	859,794	7%	189 \$/m	11 \$/m2	39.3 \$/m3
surface course	80,500 m2		1,800,040	14%	396 \$/m	22 \$/m2	
bridge construction	796 m2		1,356,745	11%	298 \$/m	1704 \$/m2	
slope protection			1,581,848	17%	470 \$/m		
drainage			2,136,781	3%	74 \$/m		
miscellaneous			335,445	3%	74 \$/m		
bio engineering			285,106	2%	63 \$/m		
daywork			83,138	1%	18 \$/m		
subtotal			12,372,590	96%	2,719 \$/m		
PS			57,796	0%	13 \$/m		
contingency			400,000	3%	88 \$/m		
subtotal			457,796		101 \$/m		
Total			12,830,386	100%	2,820 \$/m		

Attachment 1-7: Unit Rate List of Similar Past Project for Major Items

Example of the Unit Rate List from Similar Past Road Project

Road	Distance (km)	Total Cost (US\$)	Cost/km (US\$)
Tibar-Liquica	28.7	20,516,415	715,000
Tibar-Gleno	32	29,292,168	915,000
Manatuto-Laclubar	35	28,011,855	800,000
Laclubar-Natarbora	47	34,379,730	731,000
Aileu-Ainaro, Lot 3	30	28,823,606	961,000
Aileu-Ainaro, Lot 4	25	28,138,737	1,126,000
Aileu-Ainaro, Lot 5	23	26,875,070	1,168,000
Maubara-Karimbala	37.8	20,748,566	549,000
Dili-Manatuto	48.7	48,314,976	992,000
Manatuto-Baucau	57.7	59,287,454	1,028,000
Baucau-Lautem	59.3	29,315,346	494,000
Average			862,000

Example of the Unit Rate List from Similar Past Building Project

Building	Total Area (m2)	Component	Cost	Unit rate (m2)
CNE National Election Commission	3,249	Physical	2,843,913	957
		Design	132,195	
		Supervision	116,643	
		PMU	17,730	
		Total (US\$)	3,110,482	
CFP Public Service Commission	3,984	Physical	3,031,548	761
		Design	140,917	
		Supervision	124,339	
		PMU	18,900	
		Total (US\$)	3,315,704	
MoJ (Ministry of Justice)	5250	Physical	4,4044,938	770
		Design	188,023	
		Supervision	165,903	
		PMU	25,217	
		Total (US\$)	4,424,082	
MoF (Ministry of Finance)	20,516	Physical	20,356,530	992
		Design	749,748	
		Supervision	621,158	
		PMU	67,565	
		Total (US\$)	21,795,000	

Attachment 1-8: Example 1 of Quantity calculation required in FS for Road Project
(This shows the best practice example for reference)

Major Group	Work item	Pay item	unit	calculation method	calculation basis	remarks
Earthwork	Cut & fill work	Clearing and grubbing	M2	Objects are upland and hill with trees. Calculate by projected area to horizontal plan.	plan 1/3000~1/5000	calculates by planimeter
		Cut & fill work	M3	Calculate with 100m interval using Cross section of scale 1/200 – 1.500	cross section 1/200~1/500	No consideration for soil kind, changing ratio or deduction of ditch etc.
		Slope	M2	Calculate the area for cut & fill area separately using cut section of scale 1/200 ~ 1/500. Gardening area should be calculated separately.	cross section 1/200~1/500	No consideration for special slope work
		Retaining wall	M or M2	Calculate from plan & cross section.	plan & cross section	
		Ditch/Gutter	M	Calculates quantity from plan & cross section.	plan & cross section	No consideration for the foundation treatment
Pavement	Pavement work	Pavement work	M2	Calculates pavement area by cross-sectional area calculation sheet.		
		Curbs (ACC/CCC)	M	Calculate the length		
Tunnel			M	Calculate tunnel length.		
Bridge	long bridge middle bridge small bridge over bridge	Foundation Substructure Superstructure Paving Handrailing Lighting	M2	Calculates the bridge are using plan.		Bridge type, span will be decided from topography conditions and workability etc.
Ancillary facilities	Median strip costs	Median	M	Calculate from earthwork length	Plan	
	Road facilities	Interchange Service area Parking area Bus stop	set	Principally check the style and the area only. If necessary, calculate the details as shown above.	Plan 1/3000~1/5000	
	Traffic management facilities	Traffic sign Fence Illumination Tel com duct facilities	Km Km Set Km Set	Rough estimate as same as outline design or by quantity survey list		
Miscellaneous work costs	General work	Sound wall Plantation Protection Snow guards	M KM Set Set	Rough estimate as same as outline design or by quantity survey list		
Land compensation cost	Land	Housing area Field Forest others	M2 M2 M2 M2	Rough estimate as same as outline design or by quantity survey list		

	compensation	House Power line Vegetation Public facilities others		Rough estimate as same as outline design or by quantity survey list		
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Note: Please see Attachment 9, if necessary

Attachment 1-9: Example 2 of Quantity calculation required in FS for Road project

Major group	Work item	Pay item	unit	calculation method	calculation basis	remarks
Earthwork	Cut & fill work	Clearing and grubbing	M2	Objects are upland and hill with trees. Calculate by projected area to horizontal plan.	plan 1/1000	
		Road excavation Borrow excavation waste excavation	M3 M3 M3	Calculate by planimeter for each cross section. The volume should be divided into "Road excavation", "Borrow excavation" and "waste excavation" form the total volume of cut and fill. Percentage of 3 kinds of excavation will be decided by the average for each section	cross section 1/200	
		Upper subgrade	M2	Calculate from design cross section	Calculation sheet for cut/embank	
	Stabilization of ground	Sand mat	M2	Calculate by planimeter	plan 1/1000	
		Sand drain Sand compaction	M	decide the pitch & diameter from the design calculation book	Cross section 1/200	
	Slope	Seed spray Seed blow Loan Vegetation (hole) Concrete frame Rock net Rock guard Net fence	M2	calculate the area separating to cut and fill area cross section the ratio of each methods will be decided considering the soil conditions Calculate of area of specific one, such as concrete block etc., if applied them	Cross section 1/200	
	Retaining wall	Concrete block Gravity type Reverse T Leaning type	M2 M M M	Calculate the quantity after preparing simple expansion plan	Plan 1/1000 Cross section 1/200 Expansion plan	
	Ditch/ Gutter	Culvert	M	Calculate the length from Plan & Cross section Inner cross section & overburden depth should be described clearly	Plan 1/1000 Cross section 1/200	
		Pipe culvert	M	Calculate the length over 1.0 m diameter		
	Drainage	Drainage	km	Calculate from Plan	Plan 1/1000 Drainage calculation sheet	

Pavement	Subbase	Subbase	M2	Work Area should be calculated by using cut/fill checklist and cross section by separating of each direction		H=20cm
	Base Binder Surface	Base Binder Surface	M2			H=15cm H=6cm H=4cm
	Curb	AC curb	M	Calculate from plan	Plan 1/1000	
		Precast CC Curb	M			
Median strip costs	Median strip	Median W=3.0 m W=2.0 m	M	Calculate for each traffic lane width by the length of earth work	Plan 1/1000 Road length list of each road structure	
Tunnel	tunnel	Tunnel main part Illumination	M M	Calculate design length, cross-section, earth volume, air ventilation volume etc. by dividing existence or non-existence of investigation pass and excavation methods by dynamite or mechanical method	Plan 1/1000 Cross-section calculation sheet	
Bridge costs	long-span bridge middle bridge small bridge	Super structure	M2	calculates the bridge surface area bridge type & span should be decided considering the location and installation conditions through the discussion with the owner (agency)	General drawing Plan 1/1000 Plan 1/200 Longitudinal section	long-span: >50m Middle<50m Type: * Steel * PC * RC
		substructure	No	Calculate separately by Type, Height, Width, Fix, Movable etc. against abutment and Piers	Cross-section	Type: * Gravity * Reverse T * Leaning * Hollow * Ramen * Single pier * Independent pier
		foundation	M or M2	Calculate separately by work item, diameter, length etc., if the foundation is necessary due to the ground conditions		Type: Precast concrete Steel pipe Site placing Deep excavation Cason (open, pneumatic)
	Over bridge Viaduct					
Road facilities	Interchange Service area Parking area Bus stop	Interchange Service area Parking area Bus stop	Set Set Set Set	Calculate by using the pay item cost of main road	Plan 1.1000 Cross section 1/200 Longitudinal section	
	Frontage road	Gravel surface Gravel base Low-cost surface	M2 M2 M2	Calculate the area separately for work item and design thickness		Gravel surface t=5cm or 10cm Gravel base 20cm Low cost pave 20cm (Base15cm+ AS5cm)
Traffic management facilities	Sign board	Sign board	km	Calculate the road length excluding tunnel length	Plan 1/1000	
	Protection Fence	Protection Fence	km	Calculate the length of fill section for both direction		No division for guard rail / guard cable
	Guard fence	Guard fence	km	Calculate the necessary length for wire net or barbed wire		

	illumination work	Illumination work	place	Calcite for each facility including: Interchange / carriageway barrier Service are / parking area Bus-stop		Usually not necessary
	Tel com duct	Tel com duct	km	Calculate the road length excluding tunnel length		
	information and investigation facilities	Variable sign board weather monitoring equipment Traffic counter vehicle height detector	Set Set Place Set	Necessary one should be calculated		
Miscellaneous work	sound insulation walls	Sound barrier	m	Necessary one should be calculated	Plan	H2m/3m: earth section H1m/2m/3m viaduct section
	Road side vegetation	Road side vegetation	km	Calculate for earth work length		
	Environment vegetation	Environment vegetation	km	Calculate for earth work length (one side)		
	protecting work	Peg for ROW	no	For each 20m interval		
	countermeasure against snow ice	Road heating Protection fence Etc.	M2 M	According to local conditions		
Land compensation	land	Housing area Field Forest others	M2 M2 M2 M2	Calculates by planimeter		
	Compensation	House Power line Vegetation Public facilities others	No No. M2 No. Set	Calculate by three-oblique line method		
Supplementary works		Connection road Alternative road Alternative canal River work Erosion work Alternative bridge	Set Set Set Set Set Set			

Attachment 1-10: Process up to the approval of major project of IF

In charge	Stage	Documents	Attachment	GL Reference
LMs	(Project Selection)	SDP, Master Plan		Part1.Chapter 3
	(Preparation of Concept)	Project Concept		Part1 Chapter 6
LMs	Application of the Project FS TOR		TOR (with Project Concept)	Part1.Attachment 12
ADN	Acceptance of TOR			-
LMs	Application of the budget for FS	Application letter	Project Brief and Concept	Part1. Attachment 11
MPS		Appraisal report		Part4.Chapter 2
CAFI		Approval Letter		-
NPC →LMs	Preparation of Bid Documents for FS	Bid Documents With Draft Contract documents	Invitation letter	Part4.Chapter 5.1
			Instruction o Consultants Outline of Project TOR (Requested Study) Condition of Contract Draft contract	- - Part1. Attachment 12 - -
(NPC)	Approval of Bid/Contract Documents		Draft Bid documents Draft Contract Documents	- -
NPC →LMs	(Bid process)	Pre-Bid Conference Tender		- -
		Evaluation of Each proposal Negotiation with Tenderer Signing of Contact		Part4.Chapter 4 - -
Consultants	(FS execution) IEE	Submission of FS Report	Drawings Rough Cost Estimates Checklist Others	Part1.Chapter 11 Part1. Chapter 12 Part1. Chapter 9&10 -
LMs	Evaluation of FS (Draft) Report	Evaluation report of FS	Check sheets	
	Authorization of Project	Application letter for Project Execution	Appraisal report Consultant FS report	
CAFI(MPS)		Approval Letter for Project Execution	Notice, if necessary	
NPC(&LMs)	Preparation of Bid Documents for DED		Invitation letter Outline of Project Requested Study (TOR) Condition of Contract Draft contract	
NPC	Approval of Bid/Contract Documents		Draft Bid documents Draft Contract Documents	
NPC&(LMs)	(Bid Process)			
Consultants	(DED Execution) EIA			
	Preparation of Bid Documents for Construction			
LMs	Appraisal of DED Report			
NPC	Approval of Bid/Contract Documents		Draft Bid documents Draft Contract Documents	
LMs	Land acquisition • Resettlement			
LMs	(Bid Process)			
Contractor	Construction	Notice to Proceed		
LMs	Handover the site			
LMs	Operation and Maintenance			

Jump in case of Minor Projects

Attachment 1-11: **Key Points** for the execution of the major infrastructure projects

- 1) **Project Concept** should be prepared by LMs (not by external consultant);
- 2) **Project Concept** should be realistic one including rough cost with quantitative data (Narrative one is not recommendable. Sample is shown in the Attachment 11 of Part 1 as revised draft);
- 3) **TOR** should be prepared by LMs as shown in FS Guideline and get acceptance from ADN;
- 4) **Outline Project** is recommended to attach to TOR excluding cost matters from the Project concept;
- 5) LMs should get the acceptance of FS execution from CAFI based on the Project Concept;
- 6) NPC/LMs prepare tender documents for FS based on the approval format by NPC.

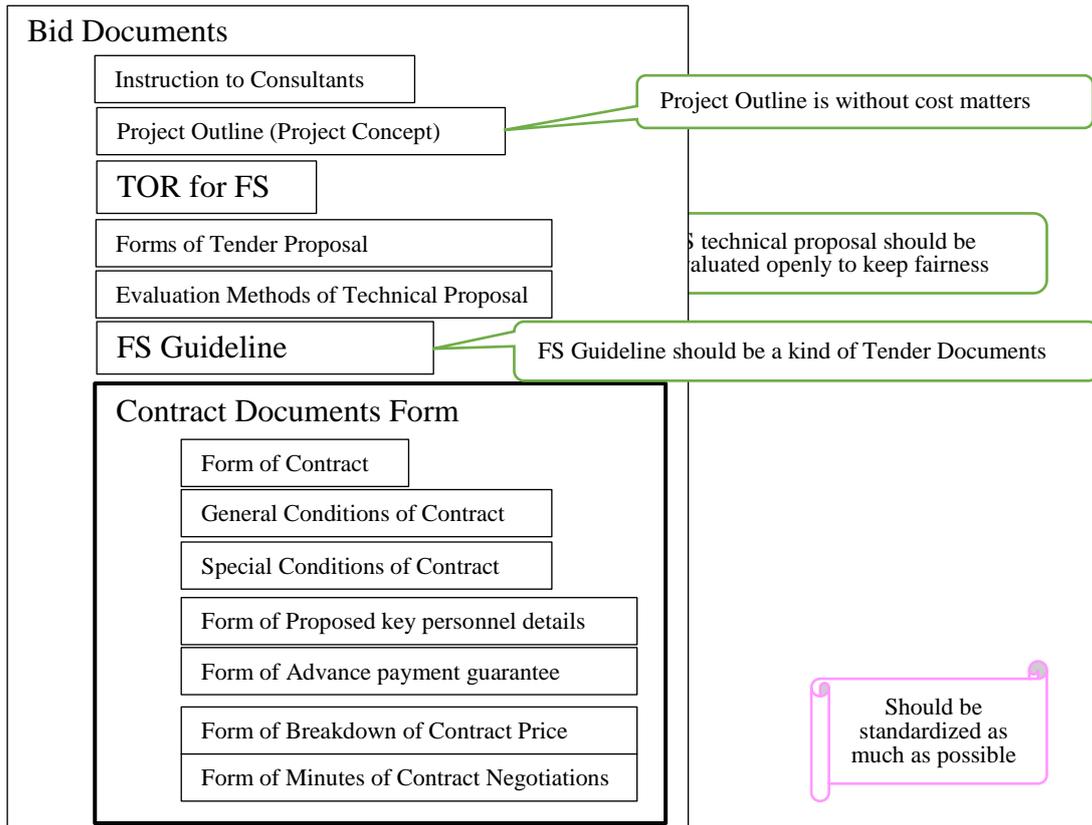


Figure: Composition of Bid Documents

- 7) FS contract price is preferable to be fixed price for the time being (1-3% of assumed construction cost).

Attachment 1-12: FS Application Form (Revised Draft of Current Version)

Project Brief					Rating	
1. Prepared by	Ministry Name				/1	
Contact person	Name: Position: Phone: Email:				/1	
Partners/ advisory Organizations, if any	Name of governmental or non-governmental organization to collaborate				/1	
2. Name of Project					/1	
3. Project Budget	US\$				/1	
Budget for 1 st year (for budget book)		Budget for 2 nd year (for budget book)			/1	
Breakdown of Major Item						
Major Item 1	\$	Major Item 5	\$		/1	
Major Item 2	\$	Major Item 6	\$		/1	
Major Item 3	\$	Major Item 7	\$		/1	
Major Item 4	\$	Major Item 8	\$		/1	
Budget verified by ADN?		<input type="checkbox"/> No	<input type="checkbox"/> Yes		/1	
Budget source for DED & Construction		<input type="checkbox"/> IF	<input type="checkbox"/> ADB	<input type="checkbox"/> JICA	<input type="checkbox"/> Others	/1
Operation & Maintenance Cost Source (O&M)		<input type="checkbox"/> IF	<input type="checkbox"/> ADB	<input type="checkbox"/> JICA	<input type="checkbox"/> Others	/1
4. Project Location	District:		Sub-District		/1	
5. Project Period	Start(month/year):	End (month/year):	Total years	_____ years	/1	
6. Type of Project					/1	
<input type="checkbox"/> Agriculture <input type="checkbox"/> Water & Sewage <input type="checkbox"/> Road <input type="checkbox"/> Bridge <input type="checkbox"/> Disaster Control <input type="checkbox"/> Urban <input type="checkbox"/> Education <input type="checkbox"/> Security <input type="checkbox"/> Defense <input type="checkbox"/> Health <input type="checkbox"/> Public Building <input type="checkbox"/> Tourism <input type="checkbox"/> Port <input type="checkbox"/> Airport <input type="checkbox"/> Resettlement <input type="checkbox"/> Maintenance <input type="checkbox"/> DED Preparation <input type="checkbox"/> Electricity <input type="checkbox"/> Informatics <input type="checkbox"/> Financial System <input type="checkbox"/> Social Solidarity <input type="checkbox"/> Youth & Sport				<input type="checkbox"/> New (Not Started) <input type="checkbox"/> Ongoing <input type="checkbox"/> Rehabilitation <input type="checkbox"/> Maintenance <input type="checkbox"/> Emergency <input type="checkbox"/> Finished 100%	/1	
7. Project Description (narrative explanation within 3-4 lines for each)						
Brief explanation of Project (Size, Feature etc.)					/1	
Project Background					/1	
Overall Goal					/1	
Problems to be solved					/1	
Strategic priority Project in Line with	Strategic Development Plan	<input type="checkbox"/> No	<input type="checkbox"/> Yes	Pages in SDP	p	/1
	Sector Plan/ Master Plan /Ministry's plan (or Name of Plan)	<input type="checkbox"/> No	<input type="checkbox"/> Yes	Pages in Plan	p	/1
8. Project Benefits						
Beneficiaries (narrative)					/1	
Benefit for Strategic					/1	

Policy (narrative)					
How many people will get benefits from the Project		<input type="checkbox"/> <10000	<input type="checkbox"/> 10,000-100,000	<input type="checkbox"/> >100,000	/1
Employment jobs	Number of jobs during Construction	Number of jobs during O&M		Total Number of other indirect jobs created by the Project	/1
					/1
IRR calculated <input type="checkbox"/> No <input type="checkbox"/> Yes		EIRR	%		/1
		FIRR	%		/1
NPV calculated <input type="checkbox"/> No <input type="checkbox"/> Yes		NPV			
B/C calculated <input type="checkbox"/> No <input type="checkbox"/> Yes		B/C			

9. Study status related to the Project (Please attach the copy to this Project Brief)					
			Agency/ Consultant conducted the Study	Status of Preparation	Year
Project Concept Design	<input type="checkbox"/> No	<input type="checkbox"/> Yes			/1
Feasibility Study (FS)	<input type="checkbox"/> No	<input type="checkbox"/> Yes			/1
Environmental Study	<input type="checkbox"/> No	<input type="checkbox"/> Yes			/1
Detailed Engineering Design	<input type="checkbox"/> No	<input type="checkbox"/> Yes			/1
Bill of Quantities (BoQ)	<input type="checkbox"/> No	<input type="checkbox"/> Yes			/1
Other study for the project, if any	<input type="checkbox"/> No	<input type="checkbox"/> Yes			/1

10. Land for Project					
Site location Identified?			<input type="checkbox"/> Yes	<input type="checkbox"/> No	/1
Resettlement is required?			<input type="checkbox"/> Yes	<input type="checkbox"/> No	/1
Necessary area	From:				
	To:				
	For bridge	(m2)	For Building	(m2)	/1
	For Road	(km)	For other	(m2)	
Land acquisition for Construction		<input type="checkbox"/> Not yet	<input type="checkbox"/> Yes, but partial	<input type="checkbox"/> Yes, more than 90%	/1
IEE (Initial Environmental Examination) is conducted?			What is the category?		/1
<input type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> A	<input type="checkbox"/> B	
			<input type="checkbox"/> C		

11. Other important information about Project, such as special conditions to implement project.	
	/1

12. If the Project cost is more than 5 million, please fill the followings:			
Necessary Budget for FS:	US\$		/1
Study Item	Cost Incurred (\$)	Period(M)	
<input type="checkbox"/> Project outline studies including scale and classification			/1
<input type="checkbox"/> Selection of technology requirements including provisions of materials and equipment			/1
<input type="checkbox"/> Cost Studies (including Land Acquisition / Resettlement)			/1
<input type="checkbox"/> Social Analysis			/1
<input type="checkbox"/> Environmental Analysis			/1
<input type="checkbox"/> Analysis for potential effects of natural hazards and climate change on the project and on the vulnerability of the people in the project site during construction and during the operation and maintenance stages			/1

<input type="checkbox"/> Operations and Maintenance Plan after project completion			/1
<input type="checkbox"/> Others (specify study item)			/1

Expected Duration of the FS Implementation	from	to	/1
--	------	----	----

Signature
Date

Name and Job title

Attachment 1-13: Model TOR

Example (Dili Water Supply 1)

Italic parts mean the sentences to be changed project by project.

1) Objective of Project (a few lines one is desirable, **maximum half page**)

Project purpose is to ask for new water resources to solve the near future vital issues. As one of most practical solution, surface water utilization from Railaco area and Gleno Area is considered. However, the river flow volume is variable according to the seasonal variation, and construction of dams with water transition pipe to the Dili purification plant are requested.

Beneficiaries: (should include estimated beneficiaries' number)

Dili citizen including Tibar and Hera (340,000 in 2030, 500,000 in 2050)

2) Background (**maximum 1 page**)

The Directorate General of _____ (hereinafter referred to as “the EMPLOYER”), the Ministry of _____, will require the consulting services of Feasibility Study (FS) of *Dili Water Supply Project* (hereinafter called as the Project).

The EMPLOYER intends to engage a consulting company (hereinafter referred to as “the Consultant”) for successful implementation of the FS, and these Terms of Reference (TOR) set out the scope of services to be provided by the Consultant.

The Project is an integral part of *the Sector Investment Plan 2018-2039 for Water Supply and sanitation in Timor Leste* with the following essential functions:

- ✓ *To ensure Water Resources to Great Dili Area, thereby contributing to civilized citizen life in Dili City;*
- ✓ *To supplement the functions of supplying water for Educational center of Hera area, New Tibar Port and its hinterland Industrial Park;*
- ✓ *To ensure the public water for green zone in the area and for fireworks; and*
- ✓ *To support the development of Great Dili and Timor-Leste.*

Water demand of Dili city (including Tibar industrial area and Tasi Tolu area) is sure to expand in the future, and a water supply project is essential to deal with this tendency.

About 600 L/Ps (=52,000m³/d) is assumed as the current resource. The shortage of water resources becomes 500 L/Ps (=40,000m³/day) in 2030 and 2000lp (=180,000m³/day) in 2050.

Ground water resources, which are very popular in present, is not recommendable considering the hygiene effect and ground settlement in future.

Project Concept/Idea for the Project was planned in *MM of YYYY* by the (Ministry Name) to properly develop *the Dili Capital City Area*.

The **Project Outline** is attached at the end of this TOR.

3) Scope of Works

3-1) General Requirement of FS

The Consultants are requested to execute FS on refereeing “FS Guideline” to achieve the above-mentioned objectives:

- ✓ Reviewing of relevant studies
- ✓ Applicable Regulation and Standard study

- ✓ Site survey
 - ✓ Technical study
 - ✓ Outline design
 - ✓ Maintenance and Operation Study
 - ✓ Rough Cost Estimation and E&F analysis
 - ✓ Initial Environmental Impact Assessment
 - ✓ Social impact Assessment
 - ✓ Preparation of Checklist of the study
- Utilization of the past existing data for survey could be recommended to shorten the implementation period of FS. However, the consultants should propose alternative method for the actual site survey with reasonable reason, if the consultant deemed such survey is necessary for the study.
 - Shorten study period by parallel works for each survey and study is recommended.
 - The cost proposal should be submitted. However, the total cost of the study should be within the fixed lump-sum amount proposed by the Employer.

FS for the documentation of this project shall include all investigations, survey, studies, the preparation of basic construction plans as defined in Chapter 7, Chapter 8 for Survey and Investigation and Chapter 9 for the study of “FS Guideline”.

3-2) Specific Request:

- 1) *Necessary water volume in 2030 shall be restudied. (not necessary to update the road map of Dili water supply)*
- 2) *Source areas and their available quantities be studied.*
- 3) *Pipe line route and necessary storages for the supply.*
- 4) *Purification plant expected to be constructed at Southern Tibar Area and/or Comoro river side*
- 5) *Distribution lines to houses and facilities will be excluded.*
- 6) *Purification plant and Distribution lines to houses with facilities are excluded.*
- 7) *Future increase of agricultural water at the water source area should be considered.*
- 8) *Dam life due to sedimentations, and measures for resettlement of residents in the future shall be considered (including necessary land regulations).*

Specific request out of General scope works should be described in

3-3) Cooperation

The EMPLOYER has a consulting meeting prior to the implementation of FS, and from time to time and as necessary, require the Consultant to render other technical support services which are deemed relevant to FS.

In carrying out the work, the Consultant shall cooperate fully with the concerned agencies of the Ministry.

3-4) Responsibility of the Government

In connection with work by the Consultant that requires the cooperation of other Government agencies, the Government will provide liaison and will ensure that the Consultant has access to all information as may be allowed by law for the performance of the Services.

3-5) Services and Facilities Provided by the EMPLOYER

The EMPLOYER shall provide the Consultant with the support staff and information to assist him in performing the services for the effective implementation of the Project:

- 1) Counterpart staff;
- 2) Provision of all available information related to the Project;

- 3) Assistance in securing all necessary permits and authorizations from the Government agencies as required for carrying out the Services.

4) Assignment of Experts

4-1) Period of FS

The required period for FS work is 4 months after Notice to Proceed up to Submission of Final Study Report.

4-2) Assignment of Experts

Expected Experts Assignment

	Degree	Experience of Similar Project	Assignment Period
<i>Water Infrastructure Engineer</i>	<i>Master</i>	<i>Min. 15 years</i>	<i>3</i>
<i>Water Dam Engineer</i>	-	<i>Min. 10 years</i>	<i>3</i>
<i>Structure Engineer</i>	-	<i>Min. 10 years</i>	<i>1</i>
<i>Environmental Specialist</i>	-	<i>Min. 10 years</i>	<i>1</i>
<i>Economic Specialist</i>	-	<i>Min. 10 years</i>	<i>1</i>

The Bidder should propose their Experts Assignment schedule to meet with the allowable budget described in Tender Documents. Technical proposal shall include the staff assignment schedule of all staff within the total study period of FS, and the detailed job description for each staff member. Work item in FS for the actual project contents could be revised or added by each Bidders idea. The Bidder should show the summary table of work sharing of each expert as shown in the Table below.

Summary of Work Sharing Table of Each Experts

Experts Name Work Item in FS	Int Expert1 or National Exp 1	Int Expert2 or National Exp 2	Int Expert3 or National Exp 3	Int Expert4 or National Exp 4	Int Expert5 or National Exp 5
Summary of the report					
Purpose of the project and Beneficiaries					
Legal regulation					
Natural conditions					
Site condition					
Similar project records					
Implementation Schedule					
Specific Technology					
Rough Cost estimate data of the past similar project					
Stakeholder’s study					
Economic & Financial Projection					
Environment & Social Assessment					
Findings and Recommendation					
Outline Drawings					
Checklist					

Note: Experts name should be actual assignment name.

The cost estimation of each staff should be shown in the Financial Proposal.

5) Reports and Documents

5-1) Report to be submitted

The Consultant shall submit the FS reports and documents in English, which should include minimum following contents. And the Main Report should be translated to Portuguese and Tetum as the official languages (excluding Attachments).

Name	Contents (not limited to)
Inception Report	A summary of the anticipated work Activities and necessary resources required for achieving projects purposes Activity schedule Contents and duration of project activities Key phases of implementation process Level of Stake holders to be involved Information about collecting tools, if any Data Analysis Rules The type of skills and abilities required to team members Duties and responsibilities of each members Period of engagement of each team member
Monthly Progress Report	Brief & concise description of followings: ✓ All activities and progress in the previous month. ✓ Problems encountered or problems anticipated with steps taken or recommendations for their correction. ✓ The works to be performed during the coming month
Draft Final Report	Refer Chapter 7 of FS-Guideline
Final Report	

5-2) Contents of Report

The contents of FS report should include followings, but not limited:

- ✓ Reviewing of relevant studies
- ✓ Applicable Regulation and Standard study
- ✓ Site survey
- ✓ Technical study
- ✓ Outline design
- ✓ Maintenance and Operation Study
- ✓ Rough Cost Estimation and E&F analysis
- ✓ Initial Environmental Impact Assessment
- ✓ Social Impact Assessment
- ✓ Checklist of the study (Page number of each item should be filled)

5-3) Reports copy Number and Submission date

Reports should be submitted as specified below:

	Hard Copy Number	Time limit
Inception Report	6 copies	Within 1 calendar week after the Notice of the Commencement of the Services of the Project.
Monthly Progress Report	5 copies	By the 10th day of each month during Study period
Draft Final Report	8 copies	Within 3 calendar weeks before the final date of contract. (Comments will be given within 1 calendar week after receiving Draft Final Report by the Employer.)
Final Report	10 copies	Within 1 calendar week after the receiving of the formal comment in written from the Employer about Draft Final Report.
<i>One Soft Copy is required with hard copies on submission of each Report</i>		

5-4) Attachment to Study Report

The Consultant shall submit following outputs with FS Report.

- 1) Outline drawings (Scale shall be around 1/1000-1/5000. Consultant shall decide the necessary drawing and its scale by the consultation meeting with EMPLOYER prior to the work): (see Chapter 11 of “Part1”);
 - ✓ Location map
 - ✓ General plan
 - ✓ Layout plan
 - ✓ Typical cross section
 - ✓ Elevation view
 - ✓ Facility plan
- 2) Rough Construction schedule (Sample Form is attached in Attachment 1-4 of “FS Guideline Part 1);
- 3) Rough Cost estimates (Sample Form is attached in Attachment 1-5 of “FS Guideline Part 1);
- 4) Quantities and Unit Rate of Major Item (Sample Form is attached in Attachment 1-6 of “FS Guideline Part 1);
- 5) Unit rate reference of the past similar project (Sample Form is attached in Attachment 1-7 of “FS Guideline Part 1);
- 6) Checklist of FS/FS Report (Sample Form is attached in Attachment 1-1 of “FS Guideline Part 1.

5-5) Checklist

- ✓ Consultant shall prepare the Checklist as the sample sheet attached to TOR.
- ✓ Checklist is important document for the EMPLOYER to check the consultant work efficiently, and consultant shall keep the following provision strictly, otherwise the appraisal rating of FS report will be subtracted by the EMPLOYER.
- ✓ Consultant shall categorize his any survey subject and any study subject according to the defined item in Chapter 8 & 9 of “FS Guideline Part 1”.
- ✓ Consultant may change his subject name for survey and study but shall keep the Category of defined item categorization for the convenience of the appraisal by the EMPLOYER.
- ✓ Consultant may add survey subject or study subject within a defined Category specified in Chapter 8 & 9 of “FS Guideline Part 1”.
- ✓ Consultant shall submit Checklist on the first meeting after starting FS works with the Employer for the discussion of Scope of Works of FS by filling the necessity Rank, which could be revised during FS with the acceptance of the Employer.
- ✓ Consultant shall put the page number about all his subject on submission of draft report and final report, where they are described in FS report. If the page number is not shown, the FS report shall be rejected without the evaluation of the FS report.

6. Outline of Project

(Followings are not TOR text, just for explanation about Outline of Project.)

- Outline of Project is requested to attach to show the details of Project Contents.
- Outline of Project could be prepared from Project Concept, which will be prepared on the initial stage of the Project. The difference between Project Concept and Outline of Project is shown in Table below:

Example structure of Project concept and Outline of project

Project Concept	Outline of Project
Project Name	Project Name
Location	Project Purpose Location
Outline scale and characteristics of the project	Background Outline scale
The reasons, especially why the project has a priority comparing with other projects	Characteristics of Project
Project benefits (if possible with the estimated amount) and beneficiaries (with estimated numbers)	Construction timeline
Expected timeline: project duration and period of completion of construction	Available source Road Map for future development
Special conditions, if any (e.g. climate, soil, residents, rare species, etc.)	(Not Necessary)
Rough cost estimate, cost/benefit (B/C) and payback period of investment	

Attachment 1-14: Workflow process for the Infrastructure Fund

