

**ANNEX T. WATERSHED MANAGEMENT AND  
NATURAL ENVIRONMENT**

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Table T.1-1 Main Watershed in East Timor

Watersheds	Area Km2	River Channel length	Flowing Direction	Watersheds	Area Km2	River Channel length	Flowing Direction
1. Loes	1919	116	North				
2. Comoro	227	33	North				
3. Lacio	1366	93	North	17. Luca	239	40	South
4. Laleia	586	55	North	18. Dilor	240	43	South
5. Vemasse	201	48	North	19. Sahem	415	54	South
6. Seical	459	45	North	20. Ciere	286	51	South
7. Nemui	119	31	North	21. Lacio do sol	272	49	South
8. Laivai	381	31	North	22. Caraulun	604	52	South
9. Radmoko	143	30	North	23. Barufu	391	46	South
10. Malaelada	223	36	North	24. Mola	261	39	South
11. Tono	610		North	25. Lourmea	353	36	South
12. Namaluto	178	24	South	26. Raiquita	125	27	South
13. Irebere	378	29	South	27. Tafara	414	45	South
14. Bebui	189	33	South				
15. Cuha	236	37	South				
16. Wetuai	247	36	South				

Source: SNC-Lavalin International, 2001, Feasibility and Engineering Study In Respect of Rehabilitation Of Identified Irrigation Schemes in East Timor .



Table T.2-1 An Overview of The Environmental Issues

Issues	Marine and coastal zone	Arid low-land areas	Moist low-land areas	High-land areas	Mountainous areas	Urban areas
<b>Water acces</b>						
Drinking water						
Problems	x	x	x	x	x	x
Irrigation water						
Problems	x	x	x	x	x	
Rural economy						
Access to markets	x	x	x	x	x	
Road destruction		x		x	x	
Lack of production Means in agriculture And fisheries	x	x	x	x	x	
<b>Watershed management</b>						
Deforestation		x	x	x	x	x
Soil/beach crosion	x	x	x	x	x	
Sedimentation	x	x		x		
Landslides		x	x		x	
Disaster floods		x	x	x	x	x
<b>Laws and regulation</b>						
Traditional local governance structures	x	x	x	x	x	x
Traditional law in function	x	x	x	x	x	?
Lack of law enforcement support	x	x			x	
Land tenure conflicts		x				
Resource protection and rehabilitation for viable use	x	x	x	x	x	
<b>Resource use</b>						
Use of non-timber Forest products (incl. Traditional medicines)	x	x	x	x		
Fuel for cooking		x		x		x
<b>Pollution and waste</b>						
Solid waste management	x	x				x
Pollution	x				x	X

(Source : Updated From Assessing Environmental Needs & Priorities in East Timor, 2001 , Norwegian Govt & UNDP)

**Table T.2-2 Sample of Project Description (PD) Form (Mehra, Los Palos)**

Sample Form 1

**1. Study Title (Project Name)**

Integrated Agricultural Development of East Timor

**2. Background Information and Objectives of Project**

After the referendum in August 1999, East Timor was separated from Indonesia. Extensive destruction of Agriculture, Forestry and Fisheries sectors in post referendum violence has caused total breakdown of the above sectors. The objective is to prepare Agriculture Development plan and some pilot projects of the above sectors.

**3. Brief Description of Project**

Outline of Project Area : East Timor with area of 14.600 km<sup>2</sup> politic , includes eastern end of the Island  
 Beneficiaries & Benefited Area : About 800.000 per persons, with 13 districts, 62 sub-districts and 449 villages.  
 Major Project Components : Development Plan for Agriculture, Forestry and Fishery sector. Pilot projects in the program in the above sectors.  
 Executing Agencies : Department of Agricultural Affairs (DAA)  
 Environmental Agencies Concerned : EPU

**4. Major Component and Development Scale of Project**

(1) Main Project Components (Development Activity)	(2) Type of Project		(3) Scale of Project		(4) Remarks
	New Project	Rehabilitation	Area, etc.	Dimension of major facilities	
a. Agricultural Development	Unknown	Unknown	ha	Unknown	IEE Agriculture, Forestry Fishery, Watershed and Environment, Livestock Development, Infrastructure and Training program.
b. Forestry Development	Unknown	Unknown	ha	Unknown	
c. Fishery Development	Unknown	Unknown	ha	Unknown	
d. Watershed and Environment	Unknown	Unknown	ha	Unknown	
e. Livestock Development	Unknown	Unknown	ha	Unknown	
f. Infrastructure Development	Unknown	Unknown		Unknown	
g. Training Program	Unknown	Unknown		Unknown	
h.					
i.					
j. Other					

**Table T.2-3 Site Description Form (SD) (Viqueque)**

Sample Form 2

**SITE DESCRIPTION FORM (SD)**

**1. Study Title (Project Name)**

Integrated Agricultural Development of East Timor  
(Mehra, los Palos)

**2. Present Socio-economic Status of Project Area**

- (1) Land ownership and land use, etc. : Private and Community Ownership. Mostly Community owned Forest.
- (2) Economic activities in and around the project area : Agriculture, Mostly rainfed and irrigated rice growing area.
- (3) Customs (riparian rights, water rights, etc.) : Traditional Law in Function, Forest- Community owned
- (4) Host people or community : Community.
- (5) Public health conditions : Poor, people suffering from malaria, respiratory and skin diseases , tuberculosis.
- (6) Population : About 120 peoples in Mehra village.
- (7) Other : .....

**3. Natural Conditions of Project Area**

- (1) Climate : Tropical monsoon zone, Two time rainy season in a year.
- (2) Topography : Nearly flat to level land.
- (3) Hydrology and Drainage conditions : Well to poorly drained.
- (4) Soils : Aquepts, Inceptisois.
- (5) Vegetations : Degraded Savanna and Grassland.
- (6) Rare species or fragile ecology : Unknown, northern part degraded forest
- (7) Other : .....

4. Environmentally Sensitive Areas in Project Site or Vicinity

Environmentally Sensitive Area	Applicable or Not					
	In Project Area			Vicinity of Project Area		
	Appl.	N.A.	Unknown	Appl.	N.A.	Unknown
<b>** Area under specific designation **</b>						
S1. Habitat of fauna and flora listed in CITES	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S2. Wetland designated under the Ramsar Convention	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	X	<input type="checkbox"/>
S3. Heritage sites listed in the World Heritage Convention	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S4. National parks, nature reserves, ets	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	X	<input type="checkbox"/>
S5. Other (None .....)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
<b>** Socioeconomically sensitive area **</b>						
S6. Areas inhabited by indigenous peoples, ethnic minorities, nomads, etc.	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S7. Historical remains, cultural assets, aesthetic sites	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	X	<input type="checkbox"/>
S8. Area likely to suffer from significant negative economic impact	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S9. Other (None .....)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
<b>** Environmentally sensitive natural land**</b>						
S10. Arid and semi-arid lands (including savanna, rangeland, etc.)	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S11. Tropical rain forests and wildlands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S12. Wetlands or peat lands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S12.1. Wetlands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S12.2. Peat lands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S13. Coastal zones	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S13.1. Mangrove forests	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S13.2. Coral reefs	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S14. Mountainous, steep-sloped, erodible or devastated lands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S15. Closed water bodies such as lakes, swamps or reservoirs	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S16. Other (None .....)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>



**Table T.2-4 Sample of Project Description (PD) Form (Viqueque)**

Sample Form 1

1. **Study Title (Project Name)**  
Integrated Agricultural Development of East Timor
  
2. **Background Information and Objectives of Project**  
After the referendum in August 1999, East Timor was separated from Indonesia. Extensive destruction of Agriculture, Forestry and Fisheries sectors in post referendum violence has caused total breakdown of the above sectors. The objective is to prepare Agriculture Development plan and some pilot projects of the above sectors.
  
3. **Brief Description of Project**  
 Outline of Project Area : East Timor with area of 14.600 km<sup>2</sup> political boundary of East Timor including 13 districts.  
 Beneficiaries & Benefited Area : About 800.000 person  
 Major Project Components : Development Plan for Agriculture, Forestry and Fishery sector. Pilot projects in the program in the above sectors.  
 Executing Agencies : Department of Agricultural Affairs (DAA)  
 Environmental Agencies Concerned : EPU
  
4. **Major Component and Development Scale of Project**

(1) Main Project Components (Development Activity)	(2) Type of Project		(3) Scale of Project		(4) Remarks
	New Project	Rehabilitation	Area, etc.	Dimension of major facilities	
a. Agricultural Development	Unknown	Unknown	ha	Unknown	IEE Agriculture, Forestry
b. Forestry Development	Unknown	Unknown	ha	Unknown	Fishery, Watershed and Environment,
c. Fishery Development	Unknown	Unknown	ha	Unknown	Livestock Development,
d. Watershed and Environment	Unknown	Unknown	ha	Unknown	Infrastructure and Training
e. Livestock Development	Unknown	Unknown	ha	Unknown	program.
f. Infrastructure Development	Unknown	Unknown		Unknown	
g. Training Program	Unknown	Unknown		Unknown	
h.					
i.					
j. Other					

**Table T.2-5 Site Description Form (SD) (Viqueque)**

Sample Form 2

**1. Study Title (Project Name)**

Integrated Agricultural Development of East Timor  
Viqueque

**2. Present Socio-economic Status of Project Area**

- (1) Land ownership and land use, etc. : Private and Community Ownership. Irrigated Rice -Private Ownership
- (2) Economic activities in and around the project area : Agriculture, Mostly rainfed and irrigated rice growing area.
- (3) Customs (riparian rights, water rights, etc.) : Traditional Law in Function, Forest- Community owned
- (4) Host people or community : Community.
- (5) Public health conditions : Poor, people suffering from malaria, respiratory and skin diseases , tuberculosis.
- (6) Population : Population of Viqueque is about 54,315
- (7) Other : .....

**3. Natural Conditions of Project Area**

- (1) Climate : Tropical monsoon zone, Two time rainy season in a year.
- (2) Topography : Undulating to Nearly Flat
- (3) Hydrology and Drainage conditions : Well to poorly drained.
- (4) Soils : Dystropepts
- (5) Vegetations : Moist Lowland Forest
- (6) Rare species or fragile ecology : Unknown
- (7) Other : .....

4. Environmentally Sensitive Areas in Project Site or Vicinity

Environmentally Sensitive Area	Applicable or Not					
	In Project Area			Vicinity of Project Area		
	Appl.	N.A.	Unknown	Appl.	N.A.	Unknown
<b>** Area under specific designation **</b>						
S1. Habitat of fauna and flora listed in CITES	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S2. Wetland designated under the Ramsar Convention	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S3. Heritage sites listed in the World Heritage Convention	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S4. National parks, nature reserves, etc.	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S5. Other (None .....)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>** Socioeconomically sensitive area **</b>						
S6. Areas inhabited by indigenous peoples, ethnic minorities, nomads, etc.	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S7. Historical remains, cultural assets, aesthetic sites	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S8. Area likely to suffer from significant negative economic impact	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S9. Other (None .....)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>** Environmentally sensitive natural land**</b>						
S10. Arid and semi-arid lands (including savanna, rangeland, etc.)	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S11. Tropical rain forests and wildlands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S12. Wetlands or peat lands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S12.1. Wetlands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S12.2. Peat lands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S13. Coastal zones	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S13.1. Mangrove forests	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S13.2. Coral reefs	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S14. Mountainous, steep-sloped, erodible or devastated lands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S15. Closed water bodies such as lakes, swamps or reservoirs	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S16. Other (None .....)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Table T.2-6 Sample of Project Description (PD) Form (Maliana)**

Sample Form 1

**1. Study Title (Project Name)**

*Integrated Agricultural Development of East Timor*

**2. Background Information and Objectives of Project**

After the referendum in August 1999, East Timor was separated from Indonesia. Extensive destruction of Agriculture, Forestry and Fisheries sectors in post referendum violence has caused total breakdown of the above sectors. The objective is to prepare Agriculture Development plan and some pilot projects of the above sectors.

**3. Brief Description of Project**

Outline of Project Area : East Timor with area of 14.600 km<sup>2</sup> political boundary of East Timor including 13 districts.  
 Beneficiaries & Benefited Area : About 800.000 person  
 Major Project Components : Development Plan for Agriculture, Forestry and natural resources preservation, fishery, Livestock and training program in the above sectors.  
 Executing Agencies : Department of Agricultural Affairs (DAA)  
 Environmental Agencies Concerned : EPU

**4. Major Component and Development Scale of Project**

(1) Main Project Components (Development Activity)	(2) Type of Project		(3) Scale of Project		(4) Remarks
	New Project	Rehabilitation	Area, etc.	Dimension of major facilities	
a. Agricultural Development	Unknown	Unknown	ha	Unknown	IEE Agriculture, Forestry Fishery, Watershed and Environment, Livestock Development, Infrastructure and Training program.
b. Forestry Development	Unknown	Unknown	ha	Unknown	
c. Fishery Development	Unknown	Unknown	ha	Unknown	
d. Watershed and Environment	Unknown	Unknown	ha	Unknown	
e. Livestock Development	Unknown	Unknown	ha	Unknown	
f. Infrastructure Development	Unknown	Unknown		Unknown	
g. Training Program	Unknown	Unknown		Unknown	
h.					
i.					
j. Other					

**Table T.2-7 Site Description Form (SD) (Maliana, Bobonaro)**

Sample Form 2

**1. Study Title (Project Name)**

Integrated Agricultural Development of East Timor  
(Maliana, Bobonaro)

**2. Present Socio-economic Status of Project Area**

- (1) Land ownership and land use, etc. : Private Ownership-Irrigated Rice, Others Community Ownership
- (2) Economic activities in and around the project area : Agriculture, Mostly rainfed and irrigated rice growing area.
- (3) Customs (riparian rights, water rights, etc.) : Traditional Law in Function, Forest- Community owned
- (4) Host people or community : Community.
- (5) Public health conditions : Poor, people suffering from malaria, respiratory and skin diseases , tuberculosis.
- (6) Population : Total Population of Maliana 19,482. The Population of Bobonaro is 62,273
- (7) Other : .....

**3. Natural Conditions of Project Area**

- (1) Climate : Tropical monsoon zone, Two time rainy season in a year.
- (2) Topography : Nearly flat to level land.
- (3) Hydrology and Drainage conditions : Well to poorly drained.
- (4) Soils : Dystropepts and Aquepts
- (5) Vegetations : Moist Lowland Forest
- (6) Rare species or fragile ecology : Unknown
- (7) Other : .....

4. Environmentally Sensitive Areas in Project Site or Vicinity

Environmentally Sensitive Area	Applicable or Not					
	In Project Area			Vicinity of Project Area		
	Appl.	N.A.	Unknown	Appl.	N.A.	Unknown
<b>** Area under specific designation **</b>						
S1. Habitat of fauna and flora listed in CITES	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S2. Wetland designated under the Ramsar Convention	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	X	<input type="checkbox"/>
S3. Heritage sites listed in the World Heritage Convention	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S4. National parks, nature reserves, etc	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S5. Other (None .....)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
<b>** Socioeconomically sensitive area **</b>						
S6. Areas inhabited by indigenous peoples, ethnic minorities, nomads, etc.	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S7. Historical remains, cultural assets, aesthetic sites	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>	X	<input type="checkbox"/>
S8. Area likely to suffer from significant negative economic impact	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S9. Other (None .....)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
<b>** Environmentally sensitive natural land**</b>						
S10. Arid and semi-arid lands (including savanna, rangeland, etc.)	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S11. Tropical rain forests and wildlands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S12. Wetlands or peat lands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S12.1. Wetlands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S12.2. Peat lands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S13. Coastal zones	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S13.1. Mangrove forests	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S13.2. Coral reefs	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S14. Mountainous, steep-sloped, erodible or devastated lands	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S15. Closed water bodies such as lakes, swamps or reservoirs	<input type="checkbox"/>	#	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
S16. Other (None .....)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

**Table T.2-8 Checklist For Initial Screening ( Mehra, Los Palos)**

1. Study Title : Integrated Agricultural Development of East Timor

2. Name of Country : East Timor

**3. Criteria for Initial Environmental Examination (IEE)**

Main Project Components	Type Of Project Activity	Initial Environmental Examination(IEE)
Agriculture Development	Not Known- Pilot Project	Yes
Forestry Development	Ditto	Ditto
Fishery Development	Ditto	Ditto
Watershed and Environment	Ditto	Ditto
Livestock Development	Ditto	Ditto
Infrastructure Development	Ditto	Ditto
Training Programme	Ditto	Ditto
Other		

**4. Area Under Specific Designation**

Environmentally Sensitive Area	Applicable or Not					
	In Project Area			Vicinity Of Project Area		
	Appl.	N.A.	Unknown	Appl.	N.A.	Unknown
a. Habitat of Fauna and Flora listed in CITES			Unknown			Unknown
b. Wetland Designated in Ramsar Convention			Unknown			Unknown
c. Heritage Sites under World Heritage Convention		N.A.				
d. National Park, Nature Reserve, etc.			Unknown			Unknown
e. Others ( )						

5. Checklist for Initial Screening

Environmental Issues	Potential SEI	Evaluation	Evaluation Base
<b>I. Social Environment</b>			
<p><b>1. Socio-economic Issues</b></p> <p>The project significantly affects Socio-Economic Activities In and around the Project, such as daily human life, economic activities transportation, community, institution, and customary practices.</p>	<p>1. Planned residential settlement 2. Involuntary resettlement 3. Substantial changes in way of life 4. Conflict among communities or peoples 5. Impact on Native people 6. Population Increase 7. Drastic changes in population composition 8. Changes in bases of economic activities 9. Occupational change &amp; loss 10. Increase in income disparities 11. Adjustment of water/fishing rights 12. Changes in Social and institutional st. 13. Changes in existing Inst. &amp; customs</p>	<p>Yes No <u>Unknown</u></p>	
<p><b>2. Health and Sanitary Issues</b></p> <p>The project significantly affects hygiene in around the Project area or related diseases.</p>	<p>1. Increase use of agrochemicals 2. Outbreak of endemic diseases 3. Spreading of epidemic diseases 4. Residual toxicity of agrochemicals 5. Increase in other human &amp; domestic</p>	<p>Yes No <u>Unknown</u></p>	
<p><b>3. Cultural Asset Issues</b></p> <p>Some historically, culturally, aesthetically or scientifically important asset located in project site.</p>	<p>1. Impairment of Historic remains and culture assets. 2. Damage to aesthetic sites</p>	<p>Yes No <u>Unknown</u></p>	
<b>II. Natural Environment</b>			
<p><b>4. Biological and Ecological Issues</b></p> <p>Some habitats for rare species or ecologically sensitive areas are located in the project or surrounding areas.</p>	<p>1. Changes in vegetation 2. Negative impacts on important or indigenous fauna or flora (extinction or 3. Degradation of ecosystem (biological div.) 4. Proliferation of exotic or hazardous sp. 5. Destruction of wetlands / peatlands 6. Encroachment into tropical rainforest 7. Destruction/degradation of mangrove 8. Degradation of coral reefs</p>	<p>Yes No <u>Unknown</u></p>	
<p><b>5. Soil and Land Resources</b></p> <p>The Project significantly induces land devastation, soil erosion, soil contamination</p>	<p>1. Soil Erosion 2. Soil salinization 3. Degradation of soil fertility 4. Soil contamination by agrochemicals 5. Devastation or desertification of land 6. Devastation of hinterland 7. Land slips / Ground subsidence</p>	<p>Yes No <u>Unknown</u></p>	
<p><b>6. Hydrology, Air and Water Quality</b></p> <p>The project significantly affects hydrological regimes of river, lake and swamp, ground water hydrology, and air or water quality.</p>	<p>1. Changes in surface water hydrology 2. Changes in ground water hydrology 3. Inundation and Flooding 4. Sedimentation 5. Riverbed degradation 6. Impediment of inland navigation 7. Water eutrophication 8. Water contamination &amp; deterioration 9. Salt water intrusion 10. Changes in temperature of water 11. Air pollution</p>	<p>Yes No <u>Unknown</u></p>	
<p><b>7. Landscape and mining Resources</b></p> <p>The project significantly affects landscape or mining resources.</p>	<p>1. Damage to landscape 2. Impediment of mining resources exploitation</p>	<p>Yes No <u>Unknown</u></p>	
<b>Overall Evaluation :</b>		<p>Yes No <u>Unknown</u></p>	



**Table T.2-9 Checklist For Initial Screening (Viqueque)**

**1. Study Title : Integrated Agricultural Development of East Timor**

**2. Name of Country : East Timor**

**3. Criteria for Initial Environmental Examination (IEE)**

Main Project Components	Type Of Project Activity	Initial Environmental Examination(IEE)
	Planning Activity	Ditto
Agriculture Development	Ditto	Ditto
Forestry Development	Ditto	Ditto
Fishery Development	Ditto	Ditto
Watershed and Environment	Ditto	Ditto
Livestock Development	Ditto	Ditto
Infrastructure Development	Ditto	Ditto
Training Programme	Ditto	Ditto
Other		

**4. Area Under Specific Designation**

Environmentally Sensitive Area	Applicable or Not					
	In Project Area			Vicinity Of Project Area		
	Appl.	N.A.	Unknown	Appl.	N.A.	Unknown
a. Habitat of Fauna and Flora listed in CITES			Unknown			Unknown
b. Wetland Designated in Ramsar Convention			Unknown			Unknown
c. Heritage Sites under World Heritage Convention		N.A.				
d. National Park, Nature Reserve, etc.			Unknown			Unknown
e. Others ( )						

5. Checklist for Initial Screening

Environmental Issues	Potential SEI	Evaluation	Evaluation Base
<b>I. Social Environment</b>			
<p><b>1. Socio-economic Issues</b></p> <p>The project significantly affects Socio-Economic Activities in and around the Project, such as daily human life, economic activities transportation, community, institution, and customary practices.</p>	<p>1. Planned residential settlement 2. Involuntary resettlement 3. Substantial changes in way of life 4. Conflict among communities or peoples 5. Impact on Native people 6. Population Increase 7. Drastic changes in population composition 8. Changes in bases of economic activities 9. Occupational change &amp; loss 10. Increase in Income disparities 11. Adjustment of water/fishing rights 12. Changes in Social and institutional st. 13. Changes in existing inst. &amp; customs</p>	<p>Yes No Unknown</p>	
<p><b>2. Health and Sanitary Issues</b></p> <p>The project significantly affects hygiene in around the Project area or related diseases.</p>	<p>1. Increase use of agrochemicals 2. Outbreak of endemic diseases 3. Spreading of epidemic diseases 4. Residual toxicity of agrochemicals 5. Increase in other human &amp; domestic</p>	<p>Yes No Unknown</p>	
<p><b>3. Cultural Asset Issues</b></p> <p>Some historically, culturally, aesthetically or scientifically important asset located in project site.</p>	<p>1. Impairment of Historic remains and culture assets. 2. Damage to aesthetic sites</p>	<p>Yes No Unknown</p>	
<b>II. Natural Environment</b>			
<p><b>4. Biological and Ecological Issues</b></p> <p>Some habitats for rare species or ecologically sensitive areas are located in the project or surrounding areas.</p>	<p>1. Changes in vegetation 2. Negative impacts on important or indigenous fauna or flora (extinction or 3. Degradation of ecosystem (biological div.) 4. Proliferation of exotic or hazardous sp. 5. Destruction of wetlands / peatlands 6. Encroachment into tropical rainforest 7. Destruction/degradation of mangrove 8. Degradation of coral reefs</p>	<p>Yes No Unknown</p>	
<p><b>5. Soil and Land Resources</b></p> <p>The Project significantly induces land devastation, soil erosion, soil contamination</p>	<p>1. Soil Erosion 2. Soil salinization 3. Degradation of soil fertility 4. Soil contamination by agrochemicals 5. Devastation or desertification of land 6. Devastation of hinterland 7. Land slips / Ground subsidence</p>	<p>Yes No Unknown</p>	
<p><b>6. Hydrology, Air and Water Quality</b></p> <p>The project significantly affects hydrological regimes of river, lake and swamp, ground water hydrology, and air or water quality.</p>	<p>1. Changes in surface water hydrology 2. Changes in ground water hydrology 3. Inundation and Flooding 4. Sedimentation 5. Riverbed degradation 6. Impediment of inland navigation 7. Water eutrophication 8. Water contamination &amp; deterioration 9. Salt water intrusion 10. Changes in temperature of water 11. Air pollution</p>	<p>Yes No Unknown</p>	
<p><b>7. Landscape and mining Resources</b></p> <p>The project significantly affects landscape or mining resources.</p>	<p>1. Damage to landscape 2. Impediment of mining resources exploitation</p>	<p>Yes No Unknown</p>	
Overall Evaluation :		<p>Yes No Unknown</p>	

**Table T.2-10 Checklist For Initial Screening (Maliana)**

**1. Study Title : Integrated Agricultural Development of East Timor**

**2. Name of Country : East Timor**

**3. Criteria for Initial Environmental Examination (IEE)**

Main Project Components	Type Of Project Activity	Initial Environmental Examination(IEE)
	Planning Activity	Ditto
Agriculture Development	Ditto	Ditto
Forestry Development	Ditto	Ditto
Fishery Development	Ditto	Ditto
Watershed and Environment	Ditto	Ditto
Livestock Development	Ditto	Ditto
Infrastructure Development	Ditto	Ditto
Training Programme	Ditto	Ditto
Other		

**4. Area Under Specific Designation**

Environmentally Sensitive Area	Applicable or Not					
	In Project Area			Vicinity Of Project Area		
	Appl.	N.A.	Unknown	Appl.	N.A.	Unknown
a. Habitat of Fauna and Flora listed in CITES			Unknown			
b. Wetland Designated in Ramsar Convention			Unknown			
c. Heritage Sites under World Heritage Convention		N.A.				
d. National Park, Nature Reserve, etc.			Unknown			
e. Others ( )						

5. Checklist for Initial Screening

Environmental Issues	Potential SEI	Evaluation	Evaluation Base
<b>I. Social Environment</b>			
<p>1. Socio-economic Issues</p> <p>The project significantly affects Socio-Economic Activities in and around the Project, such as daily human life, economic activities, transportation, community, institution, and customary practices.</p>	<p>1. Planned residential settlement</p> <p>2. Involuntary resettlement</p> <p>3. Substantial changes in way of life</p> <p>4. Conflict among communities or peoples</p> <p>5. Impact on Native people</p> <p>6. Population Increase</p> <p>7. Drastic changes in population composition</p> <p>8. Changes in bases of economic activities</p> <p>9. Occupational change &amp; loss</p> <p>10. Increase in income disparities</p> <p>11. Adjustment of water/fishing rights</p> <p>12. Changes in Social and institutional st.</p> <p>13. Changes in existing inst. &amp; customs</p>	<p>Yes</p> <p>No</p> <p>Unknown</p>	
<p>2. Health and Sanitary Issues</p> <p>The project significantly affects hygiene in around the Project area or related diseases.</p>	<p>1. Increase use of agrochemicals</p> <p>2. Outbreak of endemic diseases</p> <p>3. Spreading of epidemic diseases</p> <p>4. Residual toxicity of agrochemicals</p> <p>5. Increase in other human &amp; domestic</p>	<p>Yes</p> <p>No</p> <p>Unknown</p>	
<p>3. Cultural Asset Issues</p> <p>Some historically, culturally, aesthetically or scientifically important asset located in project site.</p>	<p>1. Impairment of Historic remains and culture assets.</p> <p>2. Damage to aesthetic sites</p>	<p>Yes</p> <p>No</p> <p>Unknown</p>	
<b>II. Natural Environment</b>			
<p>4. Biological and Ecological Issues</p> <p>Some habitats for rare species or ecologically sensitive areas are located in the project or surrounding areas.</p>	<p>1. Changes in vegetation</p> <p>2. Negative impacts on important or indigenous fauna or flora (extinction or)</p> <p>3. Degradation of ecosystem (biological div.)</p> <p>4. Proliferation of exotic or hazardous sp.</p> <p>5. Destruction of wetlands / peatlands</p> <p>6. Encroachment into tropical rainforest</p> <p>7. Destruction/degradation of mangrove</p> <p>8. Degradation of coral reefs</p>	<p>Yes</p> <p>No</p> <p>Unknown</p>	
<p>5. Soil and Land Resources</p> <p>The Project significantly induces land devastation, soil erosion, soil contamination</p>	<p>1. Soil Erosion</p> <p>2. Soil salinization</p> <p>3. Degradation of soil fertility</p> <p>4. Soil contamination by agrochemicals</p> <p>5. Devastation or desertification of land</p> <p>6. Devastation of hinterland</p> <p>7. Land slips / Ground subsidence</p>	<p>Yes</p> <p>No</p> <p>Unknown</p>	
<p>6. Hydrology, Air and Water Quality</p> <p>The project significantly affects hydrological regimes of river, lake and swamp, ground water hydrology, and air or water quality.</p>	<p>1. Changes in surface water hydrology</p> <p>2. Changes in ground water hydrology</p> <p>3. Inundation and Flooding</p> <p>4. Sedimentation</p> <p>5. Riverbed degradation</p> <p>6. Impediment of inland navigation</p> <p>7. Water eutrophication</p> <p>8. Water contamination &amp; deterioration</p> <p>9. Salt water intrusion</p> <p>10. Changes in temperature of water</p> <p>11. Air pollution</p>	<p>Yes</p> <p>No</p> <p>Unknown</p>	
<p>7. Landscape and mining Resources</p> <p>The project significantly affects landscape or mining resources.</p>	<p>1. Damage to landscape</p> <p>2. Impediment of mining resources exploitation</p>	<p>Yes</p> <p>No</p> <p>Unknown</p>	
<p>Overall Evaluation :</p>		<p>Yes</p> <p>No</p> <p>Unknown</p>	

**Table T.2-11 Initial Scoping (Mehra, Los Palos)**

Form 4

The Study Title (Project Name) : \_\_\_\_\_

**I. Social Environment**

Category of Environmental Impact 1/	Initial Evaluation 2/							Remarks
	Main Project Components 3/							
	AD	FD	FID	NR	TP	LD	ID	
<b>1. Socio-economic Issues</b>								
<b>(1) Social Issues</b>								
1. Substantial changes in way of life	C	C	C	C	C	C	C	
2. Conflict among communities and peoples	C	C		C	C	C	C	
<b>(2) Demographic Issues</b>								
1. Population increase	C	C	C	C	C	C	C	
2. Drastic Changes in Population Composition	C	C	C	C	C	C	C	
3. Other								
<b>(3) Economic Activities</b>								
1. Changes in bases of economic activities	C	C	C	C	C	C	C	
2. Occupational change and loss of job opportunity	C	C	C	C	C	C	C	
3. Increase in income disparities	C	C	C	C	C	C	C	
4. Other								
<b>(4) Institutional and Custom Related Issues</b>								
1. Adjustment and regulation of water or fishing (riparian) rights	C	C	C	C	C	C	C	
2. Changes in social and institutional structures	C	C	C	C	C	C	C	
3. Changes in existing institutional and customs	C	C	C	C	C	C	C	
4. Other								
<b>2. Health and Sanitary Issues</b>								
1. Increased use of agrochemicals	C	C	C	C	C	C	C	
2. Outbreak of endemic diseases	C	C	C	C	C	C	C	
3. Spreading of epidemic diseases	C	C	C	C	C	C	C	
4. Residual toxicity of agrochemicals	C	C	C	C	C	C	C	
5. Increase in domestic and other human wastes	C	C	C	C	C	C	C	
6. Other								
<b>3. Cultural Asset Issues</b>								
1. Impairment of historic remains and cultural assets	C	C	C	C	C	C	C	
2. Damage to aesthetic sites	C	C	C	C	C	C	C	
3. Other								

1/ Definition of each category of environmental impact is presented in Appendix A, "Significant Environmental Impacts and Issues".

2/ Each applicable item is marked with the following classifications:

A : As SEI is identified or expected, further security is required.

B : Since SEI is not fully clarified through the preliminary evaluation, further study is required.

C : As SEI is recognized to be nil, no further study is required.

3/ Main project components are abbreviated hereunder :

AD : Agricultural Development

FD : Forestry Development

FID : Fishery Development

NR : Natural Resources

TP : Training Program

LD : Livestock Development

ID : Infrastructure Development

## Checklist for Initial Scoping

### II Natural Environment

Category of Environmental Impact 1/	Initial Evaluation 2/							Remarks
	Main Project Components 3/							
	AD	FD	FID	NR	TP	LD	ID	
<b>4/ Biological and Ecological Issues</b>								
1. Changes in vegetation								
2. Negative impacts on important or indigenous fauna and flora								
3. Degradation of ecosystem with biological diversity								
4. Proliferation on exotic and/or hazardous species								
5. Destruction of wetlands and peatlands								
6. Encroachment into tropical rain-forests and wildlands								
7. Destruction and degradation of mangrove forest								
8. Degradation of coral reef								
9. Other								
<b>5/ Soil and Land Resources</b>								
<b>(1) Soil Resources</b>								
1. Soil erosion								
2. Soil salinization								
3. Degradation of soil fertility								
4. Soil contamination by agrochemical of land								
5. Other								
<b>(2) Land Resources</b>								
1. Devastation or desertification of land								
2. Devastation of hinterland								
3. Ground subsidence								
4. Other								
<b>6/ Hydrology and Air and Water Quality</b>								
<b>(1) Hydrology</b>								
1. Changes in surface water hydrology								
2. Changes in groundwater hydrology								
3. Inundation and flooding								
4. Sedimentation								
5. Riverbed degradation								
6. Impedement in inland navigation								
7. Other								
<b>(2) Water Quality and Temperature</b>								
1. Water contamination and deterioration of water quality								
2. Water eutrophication								
3. Salt water intrusion								
4. Change in temperature of water								
5. Other								
<b>(3) Atmosphere</b>								
1. Air pollution								
2. Other								
<b>7/ Landscape and Mining Resources</b>								
1. Damage to landscape								
2. Impedement of mining resources exploitation								

1/ Definition of each category of environmental impact is presented in Appendix A, "Significant Environmental Impacts and Issues".

2/ Each applicable item is marked with the following classifications:

A : As SEI is identified or expected, further security is required.

B : Since SEI is not fully clarified through the preliminary evaluation, further study is required.

C : As SEI is recognized to be nil, no further study is required.

3/ Main project components are abbreviated hereunder :

AD : Agricultural Development

FD : Forestry Development

FID : Fishery Development

NR : Natural Resources

TP : Training Program

LD : Livestock Development

ID : Infrastructure Development

Category of Environmental Impact 1/	Initial Evaluation 2/					Remarks
	Main Project Components 3/					
	AD	FD	FID	WE	TR	
<b>4. Biological and Ecological Issues</b>						
1. Changes in vegetation	C	C	C	C	C	
2. Negative impacts on important or indigenous fauna and flora	C	C	C	C	C	
3. Degradation of ecosystem with biological diversity	C	C	C	C	C	
4. Proliferation of exotic and/or hazardous species	C	C	C	C	C	
5. Destruction of wetlands and peatlands	C	C	C	C	C	
6. Encroachment into tropical rain-forests and wildlands	C	C	C	C	C	
7. Destruction or degradation of mangrove forests	C	C	B	C	C	
8. Degradation of coral reef	C	C	B	C	C	
9. Other						
<b>5. Soil and Land Resources</b>						
<b>(1) Soil Resources</b>						
1. Soil erosion	B	B	C	C	C	
2. Soil salinization	C	C	C	C	C	
3. Degradation of soil fertility	C	C	C	C	C	
4. Soil contamination by agrochemical of land	C	C	C	C	C	
5. Other						
<b>(2) Land Resources</b>						
1. Devastation or desertification of land	C	C	C	C	C	
2. Devastation of hinterland	C	C	C	C	C	
3. Ground subsidence	C	B	B	C	C	
4. Other						
<b>6. Hydrology and Air and Water Quality</b>						
<b>(1) Hydrology</b>						
1. Changes in surface water hydrology	C	C	C	C	C	
2. Changes in groundwater hydrology	C	C	C	C	C	
3. Inundation and flooding	C	C	C	C	C	
4. Sedimentation	C	C	C	C	C	
5. Riverbed degradation	C	C	C	C	C	
6. Impediment of inland navigation	C	C	C	C	C	
7. Other						
<b>(2) Water Quality and Temperature</b>						
1. Water contamination and deterioration of water quality	B	B	C	C	C	
2. Water Eutrophication	C	C	C	C	C	
3. Salt water intrusion						
4. Change in temperature of water	C	C	C	C	C	
5. Other						
<b>(3) Atmosphere</b>						
1. Air pollution	C	C	C	C	C	
2. Other						
<b>7. Landscape and Mining Resources</b>						
1. Damage to landscape	C	C	C	C	C	
2. Impediment of mining resources exploitation	C	C	C	C	C	

1/ Definition of each category of environmental impact is presented in Appendix A, "Significant Environmental Impacts and Issues".

2/ Each applicable item is marked with the following classifications:

A : AS SEI is identified or expected, further scrutiny is required.

B : Since SEI is not fully clarified through the preliminary evaluation, further study is required.

C : As SEI is recognized to be nil, no further study is required.

3/ Main project components are abbreviated hereunder :

AD : Agricultural Development

FD : Forestry Development

FID : Fishery Development

WE : Natural Resources

TP : Training Program

**Table T.2-12 Initial Scoping (Viqueque)**

Form 4

The Study Title (Project Name) : \_\_\_\_\_

**i. Social Environment**

Category of Environmental Impact 1/	Initial Evaluation 2/							Remarks
	Main Project Components 3/							
	AD	FD	FID	WE	TP	LD	ID	
<b>1. Socio-economic Issues</b>								
<b>(1) Social Issues</b>								
1. Substantial changes in way of life	C	C	C	C	C	C	C	
2. Conflict among communities and peoples	C	C	C	C	C	C	C	
<b>(2) Demographic Issues</b>								
1. Population increase	C	C	C	C	C	C	C	
2. Drastic change in population composition	C	C	C	C	C	C	C	
3. Other								
<b>(3) Economic Activities</b>								
1. Changes in bases of economic activities	C	C	C	C	C	C	C	
2. Occupational change and loss of job opportunity	C	C	C	C	C	C	C	
3. Increase in income disparities	B	B	B	B	B	B	B	
4. Other								
<b>(4) Institutional and Custom Related Issues</b>								
1. Adjustment and regulation of water or fishing (riparian) rights	C	C	C	C	C	C	C	
2. Changes in social and institutional structures	C	C	C	C	C	C	C	
3. Changes in existing institutional and customs	C	C	C	C	C	C	C	
4. Other								
<b>2. Health and Sanitary Issues</b>								
1. Increased use of agrochemicals	C	C	C	C	C	C	C	
2. Outbreak of endemic diseases	C	C	C	C	C	C	C	
3. Spreading of epidemic diseases	C	C	C	C	C	C	C	
4. Residual toxicity of agrochemicals	C	C	C	C	C	C	C	
5. Increase in domestic and other human wastes	C	C	C	C	C	C	C	
6. Other								
<b>3. Cultural Asset Issues</b>								
1. Impairment of historic remains and cultural assets	C	C	C	C	C	C	C	
2. Damage to aesthetic sites	C	C	C	C	C	C	C	
3. Other								

1/ Definition of each category of environmental impact is presented in Appendix A, "Significant Environmental Impacts and Issues".

2/ Each applicable item is marked with the following classifications:

- A : AS SEI is identified or expected, further scrutiny is required.
- B : Since SEI is not fully clarified through the preliminary evaluation, further study is required.
- C : As SEI is recognized to be nil, no further study is required.

3/ Main project components are abbreviated hereunder :

- AD : Agricultural Development
- FD : Forestry Development
- FID : Fishery Development
- WE : Natural Resources
- TP : Training Program
- LD : Livestock Development
- ID : Infrastructure Development



## Checklist for Initial Scoping

### II Natural Environment

Category of Environmental Impact 1/	Initial Evaluation 2/							Remarks
	Main Project Components 3/							
	AD	FD	FID	NR	TP	LD	ID	
<b>4/ Biological and Ecological Issues</b>								
1. Changes in vegetation								
2. Negative impacts on important or Indigenous fauna and flora								
3. Degradation of ecosystem with biological diversity								
4. Proliferation on exotic and/or hazardous species								
5. Destruction of wetlands and peatlands								
6. Encroachment into tropical rain-forests and wildlands								
7. Destruction and degradation of mangrove forest								
8. Degradation of coral reef								
9. Other								
<b>5/ Soil and Land Resources</b>								
<b>(1) Soil Resources</b>								
1. Soil erosion								
2. Soil salinization								
3. Degradation of soil fertility								
4. Soil contamination by agrochemical of land								
5. Other								
<b>(2) Land Resources</b>								
1. Devastation or desertification of land								
2. Devastation of hinterland								
3. Ground subsidence								
4. Other								
<b>6/ Hydrology and Air and Water Quality</b>								
<b>(1) Hydrology</b>								
1. Changes in surface water hydrology								
2. Changes in groundwater hydrology								
3. Inundation and flooding								
4. Sedimentation								
5. Riverbed degradation								
6. Impediment in inland navigation								
7. Other								
<b>(2) Water Quality and Temperature</b>								
1. Water contamination and deterioration of water quality								
2. Water eutrophication								
3. Salt water intrusion								
4. Change in temperature of water								
5. Other								
<b>(3) Atmosphere</b>								
1. Air pollution								
2. Other								
<b>7/ Landscape and Mining Resources</b>								
1. Damage to landscape								
2. Impediment of mining resources exploitation								

1/ Definition of each category of environmental impact is presented in Appendix A, "Significant Environmental Impacts and Issues".

2/ Each applicable item is marked with the following classifications:

A : As SEI is identified or expected, further security is required.

B : Since SEI is not fully clarified through the preliminary evaluation, further study is required.

C : As SEI is recognized to be nil, no further study is required.

3/ Main project components are abbreviated hereunder :

AD : Agricultural Development

FD : Forestry Development

FID : Fishery Development

NR : Natural Resources

TP : Training Program

LD : Livestock Development

ID : Infrastructure Development

Category of Environmental Impact 1/	Initial Evaluation 2/					Remarks
	Main Project Components 3/					
	AD	FD	FID	NR	TR	
<b>4. Biological and Ecological Issues</b>						
1. Changes in vegetation	C	C	C	C	C	
2. Negative impacts on important or indigenous fauna and flora	C	C	C	C	C	
3. Degradation of ecosystem with biological diversity	C	C	C	C	C	
4. Proliferation of exotic and/or hazardous species	C	C	C	C	C	
5. Destruction of wetlands and peatlands	C	C	C	C	C	
6. Encroachment into tropical rain-forests and wildlands	C	C	C	C	C	
7. Destruction or degradation of mangrove forests	C	C	C	C	C	
8. Degradation of coral reef	C	C	C	C	C	
9. Other						
<b>5. Soil and Land Resources</b>						
<b>(1) Soil Resources</b>						
1. Soil erosion	B	B	B	B	B	
2. Soil salinization	C	C	C	C	C	
3. Degradation of soil fertility	C	C	C	C	C	
4. Soil contamination by agrochemical of land	C	C	C	C	C	
5. Other						
<b>(2) Land Resources</b>						
1. Devastation or desertification of land	C	C	C	C	C	
2. Devastation of hinterland	C	C	C	C	C	
3. Ground subsidence	C	C	C	C	C	
4. Other						
<b>6. Hydrology and Air and Water Quality</b>						
<b>(1) Hydrology</b>						
1. Changes in surface water hydrology	C	C	C	C	C	
2. Changes in groundwater hydrology	C	C	C	C	C	
3. Inundation and flooding	C	C	C	C	C	
4. Sedimentation	C	C	C	C	C	
5. Riverbed degradation	C	C	C	C	C	
6. Impediment of inland navigation	C	C	C	C	C	
7. Other						
<b>(2) Water Quality and Temperature</b>						
1. Water contamination and deterioration of water quality	C	C	C	C	C	
2. Water eutrophication	C	C	C	C	C	
3. Salt water intrusion	C	C	C	C	C	
4. Change in temperature of water	C	C	C	C	C	
5. Other						
<b>(3) Atmosphere</b>						
1. Air pollution	C	C	C	C	C	
2. Other						
<b>7. Landscape and Mining Resources</b>						
1. Damage to landscape	C	C	C	C	C	
2. Impediment of mining resources exploitation	C	C	C	C	C	

1/ Definition of each category of environmental impact is presented in Appendix A, "Significant Environmental Impacts and Issues".

2/ Each applicable item is marked with the following classifications:

- A : As SEI is identified or expected, further security is required.
- B : Since SEI is not fully clarified through the preliminary evaluation, further study is required.
- C : As SEI is recognized to be nil, no further study is required.

3/ Main project components are abbreviated hereunder :

- AD : Agricultural Development
- FD : Forestry Development
- FID : Fishery Development
- NR : Natural Resources
- TP : Training Program

Table T.2-13 Initial Scoping ( Maliana)

Form 4

The Study Title (Project Name) : \_\_\_\_\_

I. Social Environment

Category of Environmental Impact 1/	Initial Evaluation 2/							Remarks
	Main Project Components 3/							
	AD	FD	FID	WE	TP	LD	ID	
1. Socio-economic Issues								
(1) Social Issues								
1. Substantial changes in way of life	C	C	C	C	C	C	C	
2. Conflict among communities and peoples	C	C	C	C	C	C	C	
(2) Demographic Issues								
1. Population Increase	C	C	C	C	C	C	C	
2. Drastic change in population composition	C	C	C	C	C	C	C	
3. Other								
(3) Economic Activities								
1. Changes in bases of economic activities	C	C	C	C	C	C	C	
2. Occupational change and loss of job opportunity	C	C	C	C	C	C	C	
3. Increase in income disparities	B	B	B	B	B	B	B	
4. Other								
(4) Institutional and Custom Related Issues								
1. Adjustment and regulation of water or fishing (riparian) rights	C	C	C	C	C	C	C	
2. Changes in social and institutional structures	C	C	C	C	C	C	C	
3. Changes in existing institutional and customs	C	C	C	C	C	C	C	
4. Other								
2. Health and Sanitary Issues								
1. Increased use of agrochemicals	C	C	C	C	C	C	C	
2. Outbreak of endemic diseases	C	C	C	C	C	C	C	
3. Spreading of epidemic diseases	C	C	C	C	C	C	C	
4. Residual toxicity of agrochemicals	C	C	C	C	C	C	C	
5. Increase in domestic and other human wastes	C	C	C	C	C	C	C	
6. Other								
3. Cultural Asset Issues								
1. Impairment of historic remains and cultural assets	C	C	C	C	C	C	C	
2. Damage to aesthetic sites	C	C	C	C	C	C	C	
3. Other								

1/ Definition of each category of environmental impact is presented in Appendix A, "Significant Environmental Impacts and Issues".

2/ Each applicable item is marked with the following classifications:

A : As SEI is identified or expected , further scrutiny is required.

B : Since SEI is not fully clarified through the preliminary evaluation, further study is required.

C : As SEI is recognized to be nil, no further study is required.

3/ Main project components are abbreviated hereunder :

AD : Agricultural Development

FD : Forestry Development

FID: Fishery Development

WE: Natural Resources

TP : Training Program

LD : Livestock Development

ID : Infrastructure Development

## Checklist for Initial Scoping

### II Natural Environment

Category of Environmental Impact 1/	Initial Evaluation 2/							Remarks
	Main Project Components 3/							
	AD	FD	FID	NR	TP	LD	ID	
<b>4/ Biological and Ecological Issues</b>								
1. Changes in vegetation								
2. Negative impacts on important or indigenous fauna and flora								
3. Degradation of ecosystem with biological diversity								
4. Proliferation on exotic and/or hazardous species								
5. Destruction of wetlands and peatlands								
6. Encroachment into tropical rain-forests and wildlands								
7. Destruction and degradation of mangrove forest								
8. Degradation of coral reef								
9. Other								
<b>5/ Soil and Land Resources</b>								
<b>(1) Soil Resources</b>								
1. Soil erosion								
2. Soil salinization								
3. Degradation of soil fertility								
4. Soil contamination by agrochemical of land								
5. Other								
<b>(2) Land Resources</b>								
1. Devastation or desertification of land								
2. Devastation of hinterland								
3. Ground subsidence								
4. Other								
<b>6/ Hydrology and Air and Water Quality</b>								
<b>(1) Hydrology</b>								
1. Changes in surface water hydrology								
2. Changes in groundwater hydrology								
3. Inundation and flooding								
4. Sedimentation								
5. Riverbed degradation								
6. Impedement in inland navigation								
7. Other								
<b>(2) Water Quality and Temperature</b>								
1. Water contamination and deterioration of water quality								
2. Water eutrophication								
3. Salt water intrusion								
4. Change in temperature of water								
5. Other								
<b>(3) Atmosphere</b>								
1. Air pollution								
2. Other								
<b>7/ Landscape and Mining Resources</b>								
1. Damage to landscape								
2. Impedement of mining resources exploitation								

1/ Definition of each category of environmental impact is presented in Appendix A, "Significant Environmental Impacts and Issues".

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C : As SEI is recognized to be nil, no further study is required.

3/ Main project components are abbreviated hereunder :

AD : Agricultural Development

FD : Forestry Development

FID : Fishery Development

NR : Natural Resources

TP : Training Program

LD : Livestock Development

ID : Infrastructure Development

Category of Environmental Impact 1/	Initial Evaluation 2/					Remarks
	Main Project Components 3/					
	AD	FD	FID	NR	TR	
<b>4. Biological and Ecological Issues</b>						
1. Changes in vegetation	C	C	C	C	C	
2. Negative impacts on important or indigenous fauna and flora	C	C	C	C	C	
3. Degradation of ecosystem with biological diversity	C	C	C	C	C	
4. Proliferation of exotic and/or hazardous species	C	C	C	C	C	
5. Destruction of wetlands and peatlands	C	C	C	C	C	
6. Encroachment into tropical rain-forests and wildlands	C	C	C	C	C	
7. Destruction or degradation of mangrove forests	C	C	C	C	C	
8. Degradation of coral reef	C	C	C	C	C	
9. Other						
<b>5. Soil and Land Resources</b>						
<b>(1) Soil Resources</b>						
1. Soil erosion	B	B	B	B	B	
2. Soil salinization	C	C	C	C	C	
3. Degradation of soil fertility	C	C	C	C	C	
4. Soil contamination by agrochemical of land	C	C	C	C	C	
5. Other						
<b>(2) Land Resources</b>						
1. Devastation or desertification of land	C	C	C	C	C	
2. Devastation of hinterland	C	C	C	C	C	
3. Ground subsidence	C	C	C	C	C	
4. Other						
<b>6. Hydrology and Air and Water Quality</b>						
<b>(1) Hydrology</b>						
1. Changes in surface water hydrology	C	C	C	C	C	
2. Changes in groundwater hydrology	C	C	C	C	C	
3. Inundation and flooding	C	C	C	C	C	
4. Sedimentation	C	C	C	C	C	
5. Riverbed degradation	C	C	C	C	C	
6. Impediment of inland navigation	C	C	C	C	C	
7. Other						
<b>(2) Water Quality and Temperature</b>						
1. Water contamination and deterioration of water quality	C	C	C	C	C	
2. Water eutrophication	C	C	C	C	C	
3. Salt water intrusion	C	C	C	C	C	
4. Change in temperature of water	C	C	C	C	C	
5. Other						
<b>(3) Atmosphere</b>						
1. Air pollution	C	C	C	C	C	
2. Other						
<b>7. Landscape and Mining Resources</b>						
1. Damage to landscape	C	C	C	C	C	
2. Impediment of mining resources exploitation	C	C	C	C	C	

1/ Definition of each category of environmental impact is presented in Appendix A, "Significant Environmental Impacts and Issues".

2/ Each applicable item is marked with the following classifications:

A: As SEI is identified or expected, further security is required.

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C: As SEI is recognized to be nil, no further study is required.

3/ Main project components are abbreviated hereunder :

AD : Agricultural Development

FD : Forestry Development

FID : Fishery Development

NR : Natural Resources

TP : Training Program

**T.D-1 : GUIDELINE ADB / CH 9.6 ATTACHMENT 2  
CHECKLIST ANNEX**

**FISHERIES AND AQUACULTURE**

Fisheries projects (natural capture of species) and aquaculture projects for growing selected species often involve the entire gamut of potential adverse environmental impacts, including impacts in natural resources, economic development values, and quality-of-life values.

**A. Environmental Problems Related to Site Selection (which might be avoided or minimized by better site selection)**

1. *Conflicts with other site (waterway) uses* : Such other uses may be the use of the same water area for tourism/recreation and navigation, and for creating more agricultural land by filling of the area.
2. *Hazards of serious pollution* : From nearby pollution-emitting facilities, sites should preferably be upstream of pollution-emitting facilities (such as oil refineries). Single slug discharges can raise havoc with entire fishery/aquaculture (F/A) operations. If pollution hazards do exist, the F/A plan should ensure careful emissions control.
3. *Remoteness from marketing /needs for freezer storage*
4. *For aquaculture, steady availability of freshwater supply* : Need to ensure year-round availability of supply which is basic for projects economics. For dam/reservoir release, this may conflict with other water use allocations in drought periods. If water is drawn from irrigation canals, canal O & M plan must enable steady delivery of water (not complete shutdown of delivery when cleaning/repairing canals).
5. *For aquaculture, costs for importing needing foods*
6. *Water quality and quantity* : Water quality (WQ) suited to the projects needs is basic for F/A operations. This includes, for fisheries, impacts on WQ likely to result from pollution inflows, changes in local hydrology from probable upstream dams or other river development, and possible seawater influx during storms.
7. *Hurricane and typhoon hazards* : Facilities design must consider these hazards (for example, the aquaculture facilities in Laguna lake near Manila are designed to minimize this problem).
8. *Labour supply problem* : including skilled labour needs
9. *Local soil properties* : For aquaculture projects, the local soils may not be suitable for furnishing structural stability for berms made from the soil, and may be excessively permeable, and moreover some soil can adversely affect water quality.
10. *Resettlement*
11. *Availability of species juvenile stock*
12. *Peripheral development hazard* : This concerns the effects of F/A water body region, including destruction of mangroves on which the project may be critically dependent for food
13. *Site filling hazard* : This is the hazard when accelerating erosion in the upstream watershed reduces the volume of the water body used for F/A operations.

14. *Security from poachers* : Poaching, either by outsiders or by insiders , can ruin project economics, In some cases, it may be desirable to organize the overall operations into a series of sections of a size suited to operation and control by a single family management.

## **B. Environmental Hazards Relating to Inadequate Design**

1. *Item A* : Design omissions on items. (A) involve the same problems as noted under (A) . design expertise is needed to minimize /offset unavoidable adverse effects due to the project location
2. *Unrealistic O&M assumptions* : Such unrealistic assumptions on the available quality of O&M can greatly undermine and negate the project economics and results in serious adverse environmental impact in a variety of ways, including many of those described in (A)
3. *Inattention to special construction requirements* : Customary types of plans and specification must be modified to provide for the incorporation of the environmental protection parameter into the plans/specifications, covering the points noted in Annex III/1 and providing for construction stage environmental monitoring as described in Annex III/3
4. *Saleability of product* : For both F/A projects, an important criterion for economic viability is the presence of a suitable market for the product and the capture or raising or species which will be favoured by the intended customers
5. *Middlemen problems* : One of the socio economic problems commonly involved in projects in F/A is the advent , during the operations phase , of in-migrants who take over the middleman's role , buying the fish from the fisherman for resale , and without control this practice can reduce the fisherman's earnings to unfair and unacceptably low levels
6. *Dredging and filling* : These activities must be carefully planned so as not to destroy precious ecology.
7. *Disease hazards* : Planning of an aquaculture venture must give attention to fishery communicable disease hazards , which can drastically reduce yields , so that the selection of species will be appropriate from the point of view of aquaculture disease hazards history in the area and availability of feasible control methods
8. *Socio economics* : In addition to item (v) , attention needs to be given to favouring local population labours needs, especially of resettles displaced by the project , and fishermen families in the vicinity whose livelihoods will be impaired by the project, rather than to import labour (to become permanent new residents)
9. *Downstream water quality* : Discharges from aquaculture project, especially those with high rates of productivity employing special aeration and feeding techniques , may need to be treated (by ponding) to prevent downstream WQ and beneficial uses
10. *New species hazards* : care must be exercised in introducing new species for aquaculture , i.e to assess the impacts on existing fishery species distribution in the area and region
11. *Permit system* : A component management system should be established to manage the new F/A to ensure proper selection of fishermen for fishing rights , for furnishing

financial assistance to enable them to get started, for preventing overfishing and illegal fishing methods, for assistance in controlling middlemen and assistance in marketing based on the use of an appropriate fee system for recovering costs

12. *Fishing village sanitation* : Proper planning and administration and guidance in the establishment /growth of fishing villages in the project vicinity should be provided to ensure that these do not turn into "sanitation messes" that pollute the F/A water body and threaten public health

### C. Environmental Hazards Related to Construction Stage

1. As noted in (B)(iii), customary types of plans and specifications must be modified to provide for incorporation of the environmental protection parameter into the plans / specifications, covering the point noted in Annex III/1 and providing for construction stage environmental monitoring as described in Annex III/3
2. For F/A projects, common construction hazards to environment include : (1) dredging/filling of ecologically sensitive areas (Annex III/5); (2) discharge of silt which diffuses and permeates sensitive areas and / or recreation beaches in the vicinity; and (3) interference with navigation (including fishermen's travel) including silt deposition into navigation channels

### D. Environmental Problems relating to Operating Stage

1. *O&M compatibilities* : A common problem in many developing countries is failure to furnish the O&M specified in the design, even when the design specifications are realistic, appropriate and affordable
2. *Monitoring* : Another common problem is failure to implement continuing periodic post-construction environmental monitoring specified in the project feasibility and/or EIA. Thus, inadequacies in the design assumptions and/or O&M may be not detected. Such feedback is essential for delineating and implementing corrective measures needed for acceptable environmental protection.

### E. Critical Environmental Review Criteria

These are criteria of special interest to environmental which should be applied to all major infrastructure or regional development :

1. Will the project cause unwarranted losses in precious/irreplaceable natural or other resources ?
2. Will the project make unwarranted accelerated use of scarce resources in favour of short-term than long-term economic needs ?
3. Will the project result unwarranted hazards to endangered species ?
4. Will the project tend to intensify undesirable migration from rural to urban sectors to an unwarranted degree ?
5. Will the project adversely depreciate the national energy/foreign exchange situation to an unwarranted degree ? Will there be intensification of national socio-economic imbalances due to increase in affluent/poor income gap ?



**T.D-2: GUIDELINE ADB / CH 9.6 : ATTACHMENT 3  
CHECKLIST ANNEX**

**IRRIGATION PROJECTS**

East Timor significant adverse environmental effects which have resulted from irrigation projects include the following (exclusive of effects of dam/storage reservoirs) :

**A. Environmental Effects Due to Project Location :**

1. *Design of hydrology* : Changes in the hydrology of waterways intercepted by irrigation canals, without careful planning can result : (1) in creating or intensifying local flooding problems; and (2) in affecting adequate ecology, including fisheries. Through evaluation of the local situations, such potential adverse impacts can be identified and the planning/design adjusted to minimize the effects.
2. *Resettlement of families displaced by project*
3. *Encroachment into forest/swamplands* : This can be caused by the project structures or by filling of swamplands to gain more farmland area. Impairment of mangrove areas maybe especially serious.
4. *Impediments to movement of wildlife/cattle/people* : Suitable crossing ways need to be provided.
5. *Encroachment of historical/cultural buildings /areas* : Need to avoid/minimize/offset such effects by careful design.
6. *Conflicts in water supply rights* : Careful planning may be needed to avoid serious conflicts with other beneficial water uses (for example, implementation of excessive irrigation projects in the upper Chao Phya Basin in Thailand has tended to "dry up" established water uses in the lower basin during the dry seasons in drought years). Also, proposed transbasin diversions, although technically feasible, may create political problems.
7. *Regional flooding and drainage hazards* : Will the structures be secure against regional flooding hazards ? Is the regional drainage pattern inadequate to meet project needs? Should the project be enlarged to obtain reasonable flood protection ?

**B. Environmental Problems relating to design (including assumptions on O & M)**

1. *Watershed erosion* : Could the project efficiency be seriously impaired by inadequate attention to erosion control in upper watershed, resulting excessive siltation problems? Is the project plan based on realistic expectations on silt runoff rates? Should the project be expanded to include such erosion control ? Could erosion in farmland areas be a serious problem and, if so, should the project include regreening ? Will the overall erosion rates result excessive canal siltation ?
2. *Water quality problems* : Diversion of water from surface streams by decreasing downstream flow can result in increasing the downstream concentrations of dissolved mineral salts and in increasing seawater encroachment into the stream system. Also, downstream salinity may be increased from return irrigation flows. Such salinity increases may adversely affect many downstream beneficial water uses, including community water supply and fisheries.

3. *Suitability of natural water quality for irrigation* : This includes such parameters as total dissolved solids, chlorides/calcium ratio, boron and others.
4. *Overpumping of groundwater* : This can lead to numerous problems , including water rights conflicts, salinization and ground subsidence.
5. *Adequacy of drainage planning* : Insufficient drainage can negate much of the project benefits, , such as from salinity encroachment , and can decrease stream capacity from siltation.
6. *Land tenure problems* : How will the project benefits can be distributed between farmers and landowners ?
7. *Farmer credit limitations* : Do the farm families have sufficient financial resources to make the needed investments in farm inputs and in land levelling/preparations ?
8. *Feasibility of cooperatives* : Does the project depend on assumed functioning of cooperatives for farm inputs and for marketing beyond the reality of the “ track record “ for such cooperatives ?
9. *Feasibility of water users associations* : Does the project depend on assumed functioning of such associations , both for water distribution and for O & M , beyond the reality of the “ track record “ for such association ?
10. *Disruption of existing farmer cooperative systems* : Does the project plan for farmer cooperation (for cooperatives and water users association) make appropriate use of existing system performing these functions ?
11. *Use of agricultural chemical* : Does the project plan provide for competent use of fertilizers and pesticides by the farmers so that proper amount will be used and so that excessive chemicals runoff does not occur causing depreciation of downstream water quality, including problems to toxicity and aquatic fauna and/or eutrophication.
12. *Selection of pesticides* : Will the project plan result in the use of environmentally acceptable (degradable) pesticides and avoid the use of hard pesticides which will accumulate in soils and stream sediments with potentials for serious effects on ecology ?
13. *Land use conflicts* : Will the project result in conflicts with other necessary land uses such as cattle grazing ?
14. *Inequities in water distribution* : Will the project ensure reasonable distribution of water throughout the service area, including provision of practicable turnout facilities?
15. *Canal maintenance* : Does the design of canals provide for reasonable protection against weed growth which could seriously impair canal capacity / If canal banks are not lined and dependence for removing weeds is placed on assumed levels of O & M, is this assumption realistic ? Also, does the design include canal gates needed for flushing ?
16. *Passageways* : Does the design incorporate adequate passageways for wildlife/cattle/people ?
17. *Scouring hazards* : Does the design incorporate adequate protection against scouring hazards at culverts, control structures, and other special structures ?

### C. Problems During Construction Stage

1. *Erosion control* : Does the construction plan include adequate provision for control of erosion and for proper rehabilitation of exposed cut-and-fill areas ?
2. *Other construction stage hazards* : Does the construction plan incorporate provision for other potential adverse effects during construction.
3. *Monitoring during construction* : Does the construction plan provide for necessary construction stage monitoring ?

### D. Problems Relating to Operations

1. *Adequacy of O & M* : Is the O & M plan realistic in terms of experience in the project area ? If there are questions on the O & M adequacy , how will the canals be cleaned of silt ? How will they be cleaned or excessive weeds, etc ?
2. *Adverse soil modifications* : Is the project likely to result in adverse soil modifications resulting from : (1) water logging, (2) soil salinization, (3) soil alkalinization, (4) nutrient leaching, (5) acid sulfate hazards, and (6) development of soil impermeability from excessive sodium ?
3. *Changes in groundwater hydrology* : Will the operation of the irrigation system change groundwater levels and adversely affect other beneficial water users ?
4. *Water-oriented diseases* : Will the changes in surface water hydrology resulting from the canal system induce new communicable diseases or increase the incidence of existing ones, including insect vector diseases such as malaria and schistosomiasis ? If the irrigation water is being drawn from a source contaminated with the schistosomiasis snails, are provisions made for screening out the snails , are provisions made for screening out the snails before the water enters the irrigation systems ?
5. *Hazards of toxic chemicals* : Will the use/misuse of toxic agricultural chemicals , especially pesticides, result in impairment of local aquaculture or of downstream fisheries or in impairment of ecology through accumulation in soil and bottom sediments ? Will misuse result in occupational health to the farmers ?
6. *Hazards of fertilizer runoff* : Will the use/misuse of fertilizer result in excessive eutrophication in the irrigation system or in the downstream waterways ?
7. *Operations monitoring* : Does the project operations plan and budget include provision for minimum necessary periodic monitoring to ensure that all essential environmental protection measures are being done, and to recommend on needed corrections ?
8. *Aquaculture water supply* : Will the project distribution system ensure year-round delivery of water to aquaculture operations whose success depend upon such year-water availability ?

### E. Realization of Enhancement Measures

Recognizing that the water distributed by the irrigation system may be the only feasible source of water for other essential water uses in the irrigation service area :

1. Does the project include an appropriate use of water for improving community water supply and sanitation facilities in the service area ?
2. Does the project include an appropriate component for making optimal use of water for improving aquaculture in the service area , especially aquaculture which is the feasible only with an assured year-round supply ?

**F. Overall Critical Environmental Review Criteria**

1. Will the project cause unwarranted losses in precious /irreplaceable natural or other resources ?
2. Will the project make unwarranted accelerated use of scarce resources in favour of short-term economics gains ?
3. Will the project adversely affect the national energy/foreign exchange situation to an unwarranted degree ?
4. Will the project result in unwarranted hazards to endangered species ?
5. Will the project tend to intensify undesirable migration from rural to urban sector ?
6. Will the project tend to increase the income gap between the poor and affluent ?

T.D-3:GUIDELINE ADB/ CH.9.6 : ATTACHMENT 4

CHECKLIST ANNEX

PROJECT IN FORESTRY

**I. Commercial Logging**

**A. Project Sitting**

1. *Watershed areas* : Is the proposed project area located in a critical watershed serving reservoirs, large population centers or industries? If so, what will be the likely effects on hydrology, siltation and water quality and how will the effects affect the various users?
2. *Relation to other dedicated land uses* : Will the proposed project area infringe on other dedicated land uses such as parks and wildlife preservation zones, mining operations, etc? Has the project been duly considered including forestry as an integral part of development taking place in other sectors? How?
3. *Traditional forest uses* : Have the different kinds and levels of the traditional forest uses by local populations and the expected effects of the project on these uses been adequately considered in the selection of project location?
4. *Resettlement* : Will the proposed project entail resettlement of indigenous populations? If so, how will this be handled?
5. *Relation to regional/national forestry plan* : Has project sitting taken into account the regional and/or national master plans for forest utilization /conservation? Does it contravene plans for conservation of minimum forest area /type that should be maintained for long-term regional welfare?
6. *Critical environmental areas* : Is the project to be located in environmentally critical areas such as land with steep slopes and fragile soils? If so, what will be effects on soil stability?
7. *Precious ecology* : Does the selected site contain rare or useful species of wildlife, fish and plants? Will the project lead to serious depletion or loss of these resources as concerns their regional or national status? Are project "with project" (compared to "without project") depletion/loss of these and other precious ecological resources sufficiently high to warrant selection of the alternative site in order to preserve these resources? If not, will appropriate mitigation measures be provided?

**B. Planning and Design**

1. *Benefit/cost analysis* : Has a benefit/cost analysis been done that clearly addresses cost due to erosion/sedimentation; increase peak flows and flood flows; loss of recreational or tourism opportunities?
2. *Operation and maintenance* : Does the fiscal set-up ensure availability of necessary O&M funds, especially for erosion and sedimentations control and forest rehabilitation? Has training for the local labor force/or foresters been included as an integral part of O&M plans as concerns technologies both at the logging site and at the processing site?

3. *Data base for decision making* : Have the impacts of the previous regional logging operations due to proper/improper planning and design been accounted for and modification been made to the project based on this information? Will sufficient information be collected on timber stand density, species composition, terrain, logging conditions and the environmental effects of logging operations to provide the basis for long-term logging and road development plans? Has provision been made to store the above information in data base of indicators that the Bank, government and others can use for planning and decision making for this and future projects? Is the data base defined/coasted and how will the financing for monitoring be ensured?
4. *Road network design* : Has planning and design of roads adequately considered soil conditions , grades and curves , water drainage, proximity to waterways , and adequate drainage? Will adequate monitoring be provided be ensure minimal erosion from road construction/operation? Has the road system been planned in advance, taking into account which areas are to be served first so that sites and directions of the proposed roads can be determined, thus reducing the area of soil disturbance and lowering construction/maintenance cost?
5. *Design of logging activities* : Does planning and design allow for minimal damage to the residual stand?
6. *Critical environmental area* : Has due consideration been given to critical areas those with extreme soil erodability, rainfall erosivity and slope gradient/length for erosion control measures?
7. *Previous ecology* :Has planning and design taken into account the mitigation/ protection/enhancement measures for rare of useful wildlife, fish and plant species, such as provision of buffer strips, of standing foods trees, of newly created protected areas around the logging site? Selective logging can enhance habitat for several species of large mammals, including elephant, deer and others.

### C. Project Operations

1. *Road construction* :
  - a. Will road construction be limited to the dry season and, if not, will there be added environmental dangers from wet season construction?
  - b. Are drains spaced properly and has wise use been made bridges, culverts and paved fords?
  - c. Have up-and-down spur roads been avoided to the maximum extent possible?
  - d. Have areas adjacent to logging roads been provided with vegetative cover, and cut-and-fill areas been reseeded to minimize erosion?
2. *Felling* :
  - a. Is the felling system employed optimal for minimizing loss of seed residual stands?
  - b. If wide-scale clear-cutting (as opposed to selecting cutting and shelter wood system) can the following effects be expected significantly accelerated erosion ; increases in height of flood peaks, serious loss of wildlife habitat ; promotion and landslides?

Clear-cutting should be avoided, particularly in unstable areas. If clear-cutting is being done, have adequate measures been taken to minimize the above impacts?

- c. Is the felling system being monitored to check compliance with the concession contract as regards size and types of trees allowed to be logged and permissible area of operations.
- d. Have precautions been taken not to disturb vegetation near waterways and to avoid blocking streams with logging debris?

### 3. *Log conveyance and allocation*

- a. Will the log conveyance system cause undue erosion and compaction? Erosion can be minimized by employing a suitable log conveyance system. Cable Yarding in hilly regions will cause minimal damage compared to ground skidding, for example.
- b. Is rational and profitable use being made of residues and will the logs be allocated to their most appropriate use so optimal benefits are gained from the logged area?

### 4. *Riparian zones*

- a. Have the following values of riparian zones been recognized and measures taken to conserve these values: enhance the quality of habitat for aquatic resources; provide a "filtering" buffer zone, inhibit rises in stream temperature and provide bank/floodplain stability, provide important habitat for wildlife; and provide a focal point for many recreational activities? Defining riparian zones can be difficult and professional judgment must usually be employed, but immediate control over these areas will significantly reduce non-point pollution and provide sufficient time to later resolve competing use demands.
- b. Have the following general rules for logging vis-à-vis riparian zones been adhered to: keep wheeled and tracked vehicles out of these zones, keep roads and trails as far away as possible, carry out all silvicultural and logging operations by hand or in riparian zone exposed during periods of high-intensity rainfall, keep traces for firebreaks as far uphill as possible?

### 5. *Socio economics*

- a. Does the project include close involvement of local leaders to avoid problems from disgruntled villagers due to loss of traditional forest uses?
- b. Is manual labor involved to the maximum extent possible and are local people given special employment considerations to provide maximum benefits to locals?
- c. Will the project provide compensation to local people for loss of forest use, such as provision of planting stock and adequate to enable production of multi-purpose species?

## **D. Post-Project**

1. *Rehabilitation and conservation*: Does the project provide for silvicultural treatment of logged-over stands and protection against encroachment and fire after the operation has ceased? If so, has adequate monitoring of such activities been provided? For selectively-logged areas, has consideration been given to incorporating the logged-

over area as a multiple-use zone within a larger conservation unit, including nature reserves/

2. *Road shutdown* : Has provision been made to "put to bed" temporary roads as spur roads after completion of the operation?

## II. Reforestation

### A. Project Sitting

1. *History of forest abuse* : Does the proposed project site have a history of forest degradation and, has an O&M plan been prepared which can realistically ensure protection of the new forest? If not, can the new forest be expected to survive or should alternative sites be considered?
2. *Relation to other dedicated land uses* : Will the project interfere with other established land uses? Has the project duly considered potentials for reclaiming for forest those areas dedicated to other uses that have not been sustainable or profitable, such as unsustainable agriculture? Does it fit in with regional/national plans for forest utilization/conservation? Are there opportunities for enhancing existing conservation areas?
3. *Resettlement* : Will the proposed project entail resettlement of local population, if so, how will this be handled?
4. *Sitting in degraded forest* : If reforestations is to be done by clearing existing degraded forest, has due consideration been given to alternative sitting in adjacent areas, thereby taking pressure off the existing forest and promoting its conservation?

### B. Planning and Design

1. *Benefit/cost analyses* : Have a benefit/cost analysis been done that clearly delineates specific benefits to result from the project , for example erosion control, savings in downstream flooding hazard; decreases in sedimentation and turbidity in streams/estuaries/near shore marine waters marine waters, including protection of fisheries and beaches ; enhanced opportunities for recreation and tourism, increased fuel sources, enhanced employment opportunities?
2. *Selection of tree species* : Is the selection of tree species optimal to meet projects objectives, and are sufficient seed supplies available? The use of monoculture planting extensive areas should be avoided, mixed crops provide greater safety against damage from pests and diseases. Have the physical and environmental site characteristics been adequately studied to help determine which tree species will best adapt to the site? In some cases attempting to reforest extremely steep and shallow soils may result in less environmental gains than leaving the area in grass/shrub cover.
3. *Precious ecology* : Have opportunities been recognized for enhancing environmental parameters such as wildlife habitat, species diversity and soil/water conservation through selection of multipurpose species and appropriate harvesting schedules? Has the project been planned so that it complements existing forest in providing critical ecological benefits?
4. *Precious ecology* : Has been identified who is to benefit from the project and how? Does the overall plan include provisions for local job employment and other incentives



for local people (such as intercropping) so they will protect the new forest? Has appropriate training of locals and/or foresters been included in the O&M plans? If the new forest has potential to attract recreation/tourism activities, will villagers be supported to meet this demand through training as guides, establishment of handicraft centers and the like? Have local needs and traditional forest uses been considered in project planning/design especially the use of forest as sources of protein, edible and medicinal plants, and recreation?

5. *Operations and maintenance* : Does the fiscal set up ensure regular availability of necessary O&M funds, especially for weeding , fire protection, watering and protection from encroachment?
6. *Data base for decision making* : Does the cited literature contain all salient, pertinent references? Have the impacts (both beneficial and adverse) of previous reforestation efforts due to the proper/improper planning and design been accounted for and modifications made to the proposed project based on this information? Does the project include a data base system. Has provision been made for systematic data gathering on such parameters as before and after effects on groundwater supplies, stream flow, wildlife use, soil building and socio economics to provide a basis for future decision making?
7. *Project financing and reservoirs* : If a major reservoir project is to be developed in the region, has the potential been explored to finance the reforestation project as a component of the reservoir project?
8. *Appropriate technology* : Is the technology to be used appropriate for *developing countries* in tropical monsoon areas or is it copied from possibly inappropriate western models?
9. *Relation to other dedicated land uses* : Have efforts been made to integrate the project into existing land uses practices and has significant modification of land use been minimized to the extent possible? If not, what are the expected social effects?
10. *Road network design* : has sufficient consideration been given to the effects of road siting to minimize erosion.
11. *Use of grasslands* : Has the use of grass cover instead of trees been considered in areas where sufficient downstream water supply is a critical concern?

### C. Project Operations :

1. *Commercial logging* : If the plantation is to be harvested, guidelines as present in Section I, Commercial Logging , will be need to be followed to minimize increased erosion and sedimentation rates. Will there be proper replanting to maintain a sustainable yield?
2. *Reduced water supplies* : have project impacts on downstream water supplies been identified? Large reforestation projects may reduce supplies of water to downstream users and reservoirs as the trees mature due to increased evapotranspiration rates. Mitigation measures such as shorter harvesting rotation or retaining grassland areas may be needed where sufficient water supply is a critical consideration.
3. *Chemicals and fertilizers* : Will suitable controls be used when applying chemicals and pesticides to protect young plants , burning slash, and applying fertilizers near waterways to avoid or minimize detrimental effects on fish and another aquatic life ?

4. *First year operations* : Has due consideration been given to erosion mitigation measures during the plantations initial year, such as leaving unplowed strips or bonding? A combination of vegetative (reforestation) and mechanical (engineering) control of erosion and overland flow can provide the most effective technique for erosion and water problems in depleted watersheds.
5. *Soil conservations benefits* : Soil conservation is perhaps the most profound environmental result of reforestation . have the following beneficial impacts been identified/maximized : erosion protection; decreased sedimentation that can affect reservoir life, water quality and aquatic/marine/estuarine system, promotion if improved soil capacity, soil surface moisture and soil nutrients?
6. *Socio economic benefits* : Have the following beneficial impacts been identified/maximized : Provision of alternative employment opportunities; increased fuel wood supplies; increased fisheries (particularly in the case of mangrove plantations); and enhancement of recreational and tourism potentials?
7. *Water resources benefits* : have the project beneficial effects on reducing over lands flows and floods peaks been identified/maximized? Reforestation beneficial/adverse effects and groundwater and periodicity of steam flow remains a topic of much debate, thus the need for a usable data base system as part of Bank-supported projects as mentioned in B (vii)

### III. Community Forestry

Consideration for sitting, planning/design and project operations as presented in the section on reforestation are, by and large, applicable to community forestry projects. Presented below are additional considerations as well as some parameters already discussed in previous sections but deserve emphasis when dealing with community forestry projects. It is assumed that the main goals of most community forestry projects are timber and fuel production and that most projects involve afforestation not use of existing forests.

#### A. Project Sitting

1. *Sitting in well-defined areas* : Will the project be located in a well-defined area such as a watershed or a group of villages?
2. *Historical patterns of illegal land use* : has special emphasis been placed on understanding historical patterns of illegal land use? Can these problems be realistically overcome? For instance, land that have a history of prior illegal use for grazing may need to be ruled out because of the hazard that these users would try to maintain their "rights" by eliminating the new forest through fire and grazing. Conversely, well-sited and designed projects can serve as an intervention to illegal use of nearby forest by offering similar products without the risk of arrest.
3. *Critical environmental area* : What effects will project harvesting rates have on soil and water? Highly unstable lands may need to be avoided because of "working" community forest can require frequent soil-disturbing harvest/ Such areas may also significantly affect expected benefit/cost ratios due to sub-optimal tree production.
4. *Essential surveys* : Have the following been surveyed prior to site selection : climate, soil and land use characteristics ; past/present types and uses of existing forests; including gathering of non wood products; wood use and needs, market prospects, community social system, land tenure and other legalities; population characteristics?

## B. Planning and design

1. *Relation to overall development*: Has the project been included as an integral part of inter sectoral development
2. *Operations and maintenance* : Effective handling of threats to the new forest is a requisite for success. Does the O&M plan provide realistic and adequately funded mechanisms to prevent encroachment and fire? Does it provide for sufficient weeding, watering and other essential maintenance?
3. *Selection of tree species* : Will single-species or multi species planting be done? Single-species forestry over large areas should be avoided as it can be particularly susceptible to pest and diseases with potential for loss of the entire crop. For similar reasons, indigenous species should be used whenever possible. Multi species planting can provide greater yields due to more efficient site utilization. In selection of tree species, has consideration been given to the potentials to improve local environmental/ecological condition such as limited wildlife habitat, soil conservation, water conservation and nutrient enhancement, particularly through use of nitrogen fixers?

## C. Socioeconomic Factors

Past projects have shown socio-economic considerations to be of paramount importance in achieving full benefits from community forestry. Major considerations are presented below.

1. *Including villagers in decision making* : Have community members, particularly village leaders, been included in decision making at all project stages?
2. *Accelerated benefit flow* : The time scale of most community forestry projects is bound to conflict with the priorities of poor rural people. Because many villagers are hard pressed to meet everyday needs, have mechanisms been included to accelerate the flow of tangible benefit to the villagers? This could include growing multi-use species, intercropping and introducing sources of income as an adjunct to the forestry project.
3. *Operations and maintenance* : Have provisions been made for training villagers and forestry officers responsible for community forestry projects? Forestry officers should be trained in social as well as technical skill. Will new local institutions such as forest cooperatives be required in order to ensure project success?
4. *Key social factors* : Have the following key social factors been considered : cultural knowledge and values regarding forestry, availability of resources – land, capital, materials and labor, social constraints on resource management, social competition and conflict over resource use?
5. *Economic inequities* : Will the project increase the gap between rich and poor members of the community? Would changes in project design or operation help bridge existing economic differences among villagers?
6. *Nutrition and health* : What likely effects will be change in land use patterns caused by the project have on nutrition and health? For example, malnutrition, has been found in many Malaysian rubber plantations because, although income has soared, local markets have few fruits and vegetables as all efforts stress industrial crops.

7. *Reliance on markets* : Will the project result in heavy reliance on markets? Community forestry projects that emphasize cash crops may suffer from significant price instability and thus increase local dependency on national/international markets?

**T.D-4 : GUIDELINE ADB/CH.9.6 : ATTACHMENT 5  
CHECKLIST ANNEX**

**ENVIRONMENTAL EFFECTS COMMONLY ASSOCIATED WITH PROJECTS  
IN COASTAL ZONE DEVELOPMENT**

**A. Introduction**

The term "coastal zone development" usually refers to projects for planning for development of coastal areas to achieve their optimal uses for multi benefit uses, including commerce, industry, shipping, recreation, forest (mangroves), drainage/flood control, fisheries/aquaculture and others. This is a relatively new area of regional planning and, over the past 15 years, has received increasing attention in industrialized countries, especially the United States and particularly in California, in recognizing that attractive coastal zones are usually relatively rare in the overall geographic region and, in the face of increasing urbanization and industrialization, it is essential to engage in specialized planning to protect as well as to use these limited precious environmental resource areas. Unfortunately, accessible coastal zone areas are not only highly attractive for urban and industrial uses, especially if useful for harbours and shipping. They also happen to be the areas where land and sea interface, where estuarine water exist, and these estuarine and near shore shallow marine waters are believed to be the most precious/sensitive nursery/reproduction zones. Hence, coastal zone planning involves a complex of many interrelating desirable uses and protection needs, and the objective of coastal zone (CZ) regional development planning is to optimise utilization-cum-built-in environmental protection.

**B. Specific Guidelines**

1. *Environmental Problems Related to Site Location (resulting in unnecessary environmental losses available through better site location planning).*
  - a. *Changes in coastal hydrology* : Some CZs are sensitive and others are more or less insensitive to the effects of constructing piers, breakwaters, etc. on ocean current patterns, on erosion/deposition of sand, and other materials. The potential of disturbing the existing erosion/deposition pattern should be carefully evaluated in site selection if valuable coastline uses (present or potential) are invaluable, including beaches and recreational areas and harbours or ports. Otherwise, the cost of connection measures such as dredging/filling may be too high to be acceptable.
  - b. *Changes in coastal drainage pattern* : CZ development projects not properly sited commonly result in market alterations in the coastal land drainage pattern resulting in changes in flooding hazards and in deposition /erosion patterns, and changes in estuarine patterns and resultant changes in estuarine fisheries and aquatic ecology.
  - c. *Changes in coastal land uses* : CZ development, not properly sited, may easily lead to over-urbanization/industrialization with resulting losses of precious coastal ecology and environmental aesthetics, including tourism and recreation values.
  - d. *Encroachments into precious ecological zones* : These include encroachment into mangrove areas, estuarine/fishery areas, coastal sand dunes, coastal beaches, and other limited precious ecology and environmental quality-of-life values.
  - e. *Resettlement*

- f. *Historical/monuments/cultural values*
- g. *Environmental aesthetics*

2. *Environmental Problems relating to Inadequate Design*

- a. *Unrealistic assumptions on available O&M skills* : A common problem is the designer's use of equipment /technology which is appropriate for industrial country use but requires O&M skill transcending those likely to be available in the operations phase of the project. The designer needs to determine the actual skills level which can be expected under likely worker income level constraints.
- b. *Changes in drainage patterns* : CZ development projects not properly sited commonly result in market alterations in the coastal land drainage pattern, resulting in changes in flooding hazards and in deposition/erosion patterns, and changes in estuarine patterns and resultant changes in estuarine fisheries and aquatic ecology.
- c. *Changes in coastal land uses* : CZ development projects not properly sited may easily lead to over-urbanization/industrialization with resulting losses of precious coastal ecology and environmental aesthetics, including tourism and recreational values.
- d. *Encroachment into precious ecological zones* : These include encroachment into mangrove areas, estuarine/fishery areas, coastal sand dunes, coastal beaches, and other limited precious ecology and environmental quality-of-life values.
  - c. *Resettlement*
  - f. *Historical/monuments/cultural values*
  - g. *Environmental aesthetics*
- h. *Pollution emissions* : For all facilities which emit significant pollutants (gaseous/liquid/solid) , appropriate treatment and disposal must be provided.
- i. *Impacts on fisheries/aquaculture/recreation* : These include evaluation of changes due to pollution emission and to changes in the basic hydrological pattern
- j. *Shipping/navigation interference*
- k. *Industrial plant site locations* : Within the total zone designated for coastal zone management, in the siting of specific industries and other pollution emitters, the planner/designer should give due consideration to variations within the zone of receiving water, capabilities for absorbing waste effluents, and where possible to use sites where access to open ocean waters will be feasible using either submarine outfalls or structures such as piers which extend into the ocean.
- l. *Area sanitation* : Consideration must be given to devising the optimal plan for management of sanitary and industrial wastes produced in the CZ area (liquid/solid) with attention to potentials for joint sanitary/industrial systems, and with attention to disposal of septic pumped from septic tanks/leaching pits.
- m. *Dredging and filling* : These operations can result in drastic damage to aquatic ecology if this is not taken into account. Vice versa with attention to the ecological parameter, dredging/filling can be utilized to enhance the local aquatic ecology

- n. *Adequacy of buffer zones*
- o. *Traffic planning*
- p. *Hazards spills*

3. *Environmental Problems Relating to Construction Stage : These problems are similar to those for most major construction projects as discussed in Annex III/1.*

a. *Problems due to uncontrolled construction practices*

- 1) runoff erosion
- 2) worker accidents
- 3) sanitation disease hazards
- 4) insect vector disease hazards
- 5) hazardous materials handling
- 6) dust/odors/fumes
- 7) explosion/fire hazards/hazardous materials spills
- 8) noise/vibration hazards
- 9) quarrying/blasting hazards
- 10) traffic congestion
- 11) water pollution hazards
- 12) blockage of wildlife passageways

b. *Inadequate construction monitoring*

4. *Environmental Problems relating to Operations Stage*

a. *O&M capabilities : A common problem in many developing countries is failure to furnish the O&M specified in the design, even when the design specifications are realistic, appropriate and affordable.*

b. *Monitoring : Another common problem is failure to implement continuing periodic post-construction environmental monitoring as specified in the project feasibility and/or EIA/. Thus, inadequacies in design assumptions and/or O&M may not be detected. Such feedback is essential for delineating and implementing corrective measures needed for acceptable environmental protection.*

5. *Critical Environmental Review Criteria : These are criteria of special interest to environmental which should be applied to all major infrastructure or regional development planning projects.*

- a. *Will the project cause unwarranted losses in precious/irreplaceable natural or other resources ?*
- b. *Will the project make unwarranted accelerated use of scarce resources in favour short-term over long-term economic needs ?*
- c. *Will the project result in unwarranted hazards to endangered species?*
- d. *Will the project tend to intensify undesirable migration from rural to urban sectors to an unwarranted degree?*

- c. Will the project adversely depreciate the national energy/foreign exchange situation to an unwarranted degree? Will there be intensification of national socio-economic imbalances due to increase in affluent/poor income gap ?