in the project area and vicinity, the corresponding column should be marked with an "X" .

[Natural Environment]

S11. Tidal flats: Whether tidal flats are located in the project area and vicinity.

S12. Mangrove Forests: Whether mangrove forests are located in the project area and vicinity.

S13. Coral Reefs: Whether coral reefs are located in the project area and vicinity.

S14. Sea grass beds: Whether sea grass beds are located in the project area and vicinity.

S15. Semi-closed water areas: Whether semi-closed water areas where changes in water level or water pollution are likely to cause negative environmental impact, arelocated in the project area and vicinity.

S16. Others: In the case where any other type of natural environment besides areas listed above are located in the project area and vicinity, the corresponding column should be marked with an "X" .

5) Other Information

Brief description of any available information pertaining to the serious environ mental impact observed in the project area and/or vicinity, or at a similar project site.

2.3.4 Samples for PD and SD Forms

Two completed examples of PD and SD forms are attached for reference.

Example 1: Fishery Marketing 1 ..... Project PD Form
Fishery Marketing 2 ..... Project SD Form

Example 2: Fishery Development Program 1 ..... Project PD Form
Fishery Development Program 2 ..... Project SD Form

Example 1: Fishery Marketing 1

Project Description (PD) Form

Form 1

1. **Study Title (Project Name)**
Study on Improvement Plans for Fishery Marketing System in State B, Country A.

2. **Background Information and Objectives of Project**
Government of Country A made a request to the Government of Japan for a study on the fishery marketing system improvement to increase fishermen's income. Purpose of this study is F/S to provide organization and institution, and facilities for fishing ports and marketing in State B as a model case for improving existing system in Country A.

3. **Brief Description of Project**

Outlines of Project Area : Mouth of River C along State B

Beneficiaries and Benefited Area : Approximate population 15,000 and area 6,000km 2

Major Project Components : Marketing, fishing ports, and processing facilities

Executing Agencies : Ministry of Agriculture

Environmental Agencies Concerned : Environment Agency

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

(1)Main Components (Development activities)	(2)Type of Operation New	Rehabilitation	(3)Scale of Project Area	Dimension of Major Facilities	(4)Remarks
a. Capture Fishery	☐	☐			
b. Resource Enhancement	☐	☐			
c. Aquaculture	☐	☐			
d. Fishing Ports	☒	☐	7.7ha	Breakwater, Dockyard	
e. Processing	☒	☐	0.3ha	Surimi factory (production 20t/day)	
f. Marketing	☒	☐	0.5ha	0.3ha	
g. Other	☐	☐			

Example 1: Fishery Marketing 2

Site Description (SD) Form

Form 2-1

1. **Study Title (Project Name)**
Studies on Improvement Plans for Fishery Marketing System in State B, Country A.

2. **Present Socio-Economic Status of the Project Area**

(1) Land Ownership and Land Utilization :Public Fishing Cooperation possess 18%, and 82% of private owership.

(2) Population :Population of City D and State B is 100,000 and 200,000, respectively, with in creasing at a rate of 2%.

(3) Economic Activities in and around the Project Area :Mainly capture fishing, and agriculture(rice production)

(4) Customs (Including Fishing Rights) :Strong fishery cooperatives and middlemen's organization for Chinese residents in Country A.

(5) Indigenous People and Ethnic Minorities :None.

(6) Public Health Conditions :Seasonal shellfish toxicity reported.

3. **Natural Conditions of the Project**

(1) Climate :High temperature and humidity during the rainy season from April to June.

(2) Topography :Zero meter above the sea level around the mouth of the river, and the rise of the river in the rainy season.

(3) Hydrology and Water Quality :A delta around the mouth of a river, and difficulty of navigation due to the shallow water.

(4) Soils :Moist mud.

(5) Vegetation :Grassland.

(6) Rare Species and Flora and Fauna :Mangrove forest and tidal flats.

(7) Others :

4)Environmentally Sensitive Areas in Project Site or Vicinity. Appl. and N.A. Indicate Applicable and Not Applicable Respectively.

Environmentally Sensitive Area	In Project Aree			Vicinity of Project Area		
	Appl.	N.A.	Unknown	Appl.	N.A.	Unknown
【Area under Specific Designation】						
S1. Habitat of flora and fauna listed in CITES	☐	☒	☐	☐	☒	☐
S2. Wetland designated under the Ramsar Convention	☐	☒	☐	☐	☒	☐
S3. Migratory bird habitat	☐	☒	☐	☐	☒	☐
S4. Heritage sites and assets listed in the World Heritage Convention	☐	☒	☐	☐	☒	☐
S5. National Parks and Wildlife (Flora and Fauna) Sanctuary	☐	☒	☐	☐	☒	☐
S6. Others	☐	☐	☐	☐	☐	☐
【Social Environment 】						
S7. Areas inhabited by indigenous peoples, ethnic minorities, etc.	☐	☒	☐	☒	☐	☐
S8. Historical remains, cultural assets and aesthetic sites	☐	☒	☐	☐	☒	☐
S9. Area likely to suffer from significant adverse socio-economic activities	☐	☒	☐	☒	☐	☐
S10. Others	☐	☐	☐	☐	☐	☐
【Natural Environment 】						
S11. Tidal flats	☒	☐	☐	☒	☐	☐
S12. Mangrove forests	☒	☐	☐	☒	☐	☐
S13. Coral reef	☐	☒	☐	☐	☒	☐
S14. Sea grass beds	☐	☒	☐	☒	☐	☐
S15. Semi-closed water areas	☒	☐	☐	☒	☐	☐
S16. Others	☐	☐	☐	☐	☐	☐

5) Other Information

The improvement of the marketing system will bring about a rational fish price, and stabilization of small-scale fishermen's income.

The new marketing system will also possibly affect changes of the existing marketing system for Chinese middlemen's organizations.

Exmaple 2: Fishery Development Program 1

Project Description (PD) Form

Form 1

1. **Study Title (Project Name)**
   Study on fishery development plan in Country A.

2. **Background Information and Objectives of Project**
   The government of Country A for a part of the second national palns sets forth a fishery development plan by means of resource enhancement including fish seed production and seed release for small-scale and lowincome fishermen of Prefecture B. P urpose of this study is F/S to develop fishery including fish culture and enhancement in City C as a model case.

3. **Brief Description of Project**

Outlines of Project Area	:Coastal area in Sea F adjoining lagoon D located in City C, Prefecture B.
Beneficiaries and Benefited Area	:Approximately 10,000 small-scale and low-income fishermen.
Major Project Components	:Fishery, resource enhancement and aquaculture.
Executing Agencies	:Ministry of Fishery and fishery development research institutes of Country A.
Environmental Agencies Concerned	:Ministry of Environment of Country A.

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

(1)Main Components (Development activities)	(2)Type of Operation New	Rehabilitation	(3)Scale of Project Area	Dimension of Major Facilities	(4)Remarks
a. Capture Fishery	☒	☐	1000km of shoreline, coastal resource		
b. Resource Enhancement	☒	☐	20km^2 of coastal area	Artificial Reefs, Seed Production	
c. Aquaculture	☒	☐	100ha	Marine aquaculture facilities	
d. Fishing Ports	☐	☐			
e. Processing	☐	☐			
f. Marketing	☐	☐			
g. Other	☐	☐			

Example 2: Fishery Development Program 2

Site Description (SD) Form

Form 2-1

1. **Study Title (Project Name)**
   Study on fishery development plan in Country A.

2. **Present Socio-Economic Status of the Project Area**

(1) Land Ownership and Land Utilization	:Land for aquaculture facilities and resource enhancement possessed by Prefecture B.
(2) Population	:The population numbers 100,000 (drift-in from agricultural villages) in City C.
(3) Economic Activities in and around the Project Area	:Mining and manufacturing industries (tin mines)
(4) Customs (Including Fishing Rights)	:A common property system held by indigenous people (fishing grounds).
(5) Indigenous People and Ethnic Minorities	:Most indigenous people engage in small-scale fisheries (combined with agriculture).
(6) Public Health Conditions	:Water pollution exists around a fishing port where small-scale and low-income fishermen live.

3. **Natural Conditions of the Project**

(1) Climate	:High temperature and humidity with hurricanes during March and May.
(2) Topography	:Area of a lagoon is 10km^2.
(3) Hydrology and Water Quality	:Effluent pollution from old tin mines.
(4) Soils	:Partially acid soil.
(5) Vegetation	:Grassland.
(6) Rare Species and Flora and Fauna	:Mangrove forest, tidal flats, and spawning grounds for sea turtles.
(7) Others	:

4)Environmentally Sensitive Areas in Project Site or Vicinity. Appl. and N.A. Indicate Applicable and Not Applicable Respectively.

Environmentally Sensitive Area	In Project Aree			Vicinity of Project Area		
	Appl.	N.A.	Unknown	Appl.	N.A.	Unknown
【Area under Specific Designation】						
S1. Habitat of flora and fauna listed in CITES	☒	☐	☐	☒	☐	☐
S2. Wetland designated under the Ramsar Convention	☐	☒	☐	☐	☒	☐
S3. Migratory bird habitat	☐	☒	☐	☐	☒	☐
S4. Heritage sites and assets listed in the World Heritage Convention	☐	☒	☐	☐	☒	☐
S5. National Parks and Wildlife (Flora and Fauna) Sanctuary	☐	☒	☐	☒	☐	☐
S6. Others	☐	☐	☐	☐	☐	☐
【Social Environment 】						
S7. Areas inhabited by indigenous peoples, ethnic minorities, etc.	☒	☐	☐	☒	☐	☐
S8. Historical remains, cultural assets and aesthetic sites	☐	☒	☐	☒	☐	☐
S9. Area likely to suffer from significant adverse socio-economic activities	☐	☒	☐	☒	☐	☐
S10. Others	☐	☐	☐	☐	☐	☐
【Natural Environment 】						
S11. Tidal flats	☒	☐	☐	☒	☐	☐
S12. Mangrove forests	☒	☐	☐	☒	☐	☐
S13. Coral reef	☐	☒	☐	☐	☒	☐
S14. Sea grass beds	☒	☐	☐	☒	☐	☐
S15. Semi-closed water areas	☒	☐	☐	☐	☒	☐
S16. Others	☐	☐	☐	☐	☐	☐

5) **Other Information**

Reginal fishery development must be carried out avoiding serious environmental impacts to spawning grounds of sea turtles, dwellings of indigenous peoples, mangrove forests, tidal flats, sea grass beds, andsemi-closed water areas.

2.4 Initial Screening

2.4.1 Gist of Preparations

(1) Purpose

The purpose for initial screening is to identify the significant environmental issues regarding potential environmental impact which may be induced by the implementation of the proposed project, and to elicit environmental issues requiring environmental consideration for subsequent field work to be conducted by the preparatory study mission.

Initial screening is the first step for the requested development study, requires particular environmental consideration procedures, and is carried out during the in-house preparatory work on the basis of document request for the proposed project from the recipient country PD and SD forms, and a prepared checklist are required for initial screening.

(2) Method of Initial Screening

Since there are many recipient countries undergoing technical assistance which exhibit diverse socio-economic and natural environments, there are not absolute quantitative criteria for initial screening in the evaluation of the degree of environmental impact. The evaluation criteria in the initial screening are, hence, carried out in accordance with; ① criteria for IEE and EIA in the recipient country; ② international treaties related to fishery and the environment, and ③ regulations for specifically designated areas such as national parks, natural preserves, etc. Initial screening in the Guidelinesis carried out in accordance with qualitative measures and the following environmental issues.

1) Social Environment

① Socio-Economic Issues: Whether the project affects adverse impacts on socio-economic activities such as everyday human life, economic activity, transportation, community structure and dynamics,institutions, customs, etc.

② Health and Sanitary Issues; Whether the project significantly affects hygiene or induces fishery related diseases.

③ Historical Remains, Cultural Assets and Landscape Issues: Whether historically, archaeologically,aesthetically, or scientifically important areas are situated in the project area.

2) Natural Environment

④ Biological and Ecological Issues: Whether habitats for rare species or ecologically fragile areas are located in the project area or in surrounding areas.

⑤ Soil and Land Issues: Whether the project significantly induces soil erosion, ground subsidence,soil contamination, etc.

⑥ Hydrology and Water Quality Issues: Whether the project significantly affects the hydrological regime of rivers, lakes and swamps, ground water hydrology, and water quality.

2.4.2 Checklist for Initial Screening

(1) Checklist Form for Initial Screening

In initial screening, the attached **Form 3**, Screening Checklist is to be completed. Joint screening in the recipient country use the same form as **Form 3.**

(2) Filling in the Checklist for the Initial Screening

In initial screening, items in **Form 3-1** are to be firstly completed, subsequently the potential significant environmental impacts(**Form 3-2**) which will be induced by the proposed project are then tentatively screened or identified. It is advisable to understand the interactions of cause and effect of significant environmental impacts at each project stage, from planning to operation by breakdown into project component and type of project. Reference to Chapter 2.9 shall be made in order to identify more significant environmental impacts in the checklist.

1) Study Title (Project name)

Title of the project for the development study described in the request of the recipient government (Name of the proposed project in request of the development study).

2) Name of Country

Name of the country where the proposed development study is to be carried out.

3) Criteria for IEE and EIA in Recipient Country

In some recipient countries, IEE and EIA procedures are requested, depending on project components,type of projects and development scale. The Guidelines users, hence, should fill in such criteria and requirements, on the basis of the information for the PD form.

Screening Checklist (Common Use for Initial and Joint Screening)

Form 3-1

1. Study Title(Project Name)

_____

2. Name of Country

_____

3. Criteria for Initial Environmental Examination (IEE) and Environmental Impact of Assessment (EIA) in Recipient County.

Main Components (Developemnt Activities)	Type of Operation (Type of activities)		Condition	
	New	Rehabilitation	IEE	EIA
a. Capture Fishery	❑	❑		
b. Resource Enhancement	❑	❑		
c. Aquaculture	❑	❑		
d. Fishing Ports	❑	❑		
e. Processing	❑	❑		
f. Marketing	❑	❑		
g. Other	❑	❑		

Screening Checklist (Common Use for Initial and Joint Screening)

4. Screening Issues

Form 3-2

Environmental Issues	Potential Significant Environmental Impact	Evaluations	Evaluation Bases
I. Social Environment			
1.Socio-economic Issues The project significantly affects socio-economic activities in and around the project site, such as daily human life, economic activities, transportation, community, institution, and customary practices.	1) Planned resettlement 2) Involuntary resettlement 3) Substantial changes in way of life 4) Conflict between communities and people 5) Impact on indigenous people 6) Increase of overland transportation 7) Population increase 8) Drastic change in population composition 9) Change in bases of economic activities 10) Reconversion and unemployment of economic activities 11) Increase of income diparity 12) Adjustment and regulation of fishing rights and water utilization rights 13) Changes in social and institutional structures 14) Changes in existing institutions and customs	Yes No Unknown	
2.Health and Sanitary Issues The project†significantly affects hygiene †in and around the project area or induces water-related diseases.	1) Increased use of fisheries pharmaceuticals 2) Outbreak of endemic diseases 3) Prevalence of infectious diseases 4) Shellfish toxicity 5) Residual toxicity of fishery pharmaceuticals 6) Increase in waste matter and excrement	Yes No Unknown	
3.Historic Remains, Cultural Assets and †Landscape Issues Some historically, culturally, aesthetically or scientifically important areas or socially valuable areas may be located in the project site.	1) Impairment †and demolition of historic remains †and †cultural assets 2) Damage to aesthetic sites 3) Impediment of mineral resource exploitation	Yes No Unknown	
II.Natural Environment			
4.Biological and Ecological Issues Some habitats for rare species or ecological areas are in the project or surrounding areas.	1) Deterioration or degradation of vegetation 2) Impacts on important or indigenous fauna and flora 3) Degradation of biological diversity 4) Impacts on fisheries resources 5) Invasion and proliferation of hazardous species 6) Disappearance of tidal flats 7) Disappearance of sea grass beds 8) Destruction of mangrove forests 9) Destruction of coral reefs	Yes No Unknown	
5. Soil and Land Resources The project significantly induces soil erosion and ground subsidence.	1) Soil erosion 2) Ground subsidence	Yes No Unknown	
6.Hydrology and Water Quality Issues Project†significantly†affects hydrological regime of rivers, lakes and swamps, seas, ground-water, and water quality.	1) Changes in river hydrology 2) Changes in groundwater hydrology 3) Sedimentation 4) Changes in water hydrology due to changes of coastal (or lacustrine) topography 5) Changes in waves due to changes of coastal (or lacutrine) topography 6) Changes in drift sand due to changes of coastal (or lacstrine) topography 7) Impediments to navigation 8) Water contaminations 9) Contamination of bottom sediments 10) Eutrophication of water 11) Changes in water temperature 12) Offensive odor pollution 13) Noise and vibration pollution	Yes No Unknown	
Overall Evaluation		Yes No Unknown	

4) Screening Issues

① Social Environment

Issues for evaluation of the social environment as they pertain to environmental considerations are as follows: socio-economic issues, health and sanitary issues, and historical remains, cultural assets and landscape issues.

② Natural Environment

Evaluation issues of natural environment are as follows: biological and ecological issues, soil and land issues, and hydrological characteristics and water quality issues.

Even where ecological systems are foreseen to be affected by the project, there may be some cases where adverse impacts are judged as acceptable vis-a-vis the positive benefits to be obtained through the project implementation. In such case, however, distribution of similar ecosystems must be carefully examined in order to justify the project.

(3) Evaluation of Each Screening Issue in Form 3

The six issues regarding the social and natural environments for initial screening (**Form 3**) indicated in the previous paragraph are evaluated as follows:

1) Even if only one potential significant environmental impact is identified while referring to the Reference Matrix Checklist for Scoping (attached **Tables 2-1** and **2-2**), the corresponding column for "evaluation" for the same issue in the checklist for initial screening should then be marked with an "X" for "Yes".

2) If no potential significant environmental impact is identified, then the "evaluation" column is marked with an "X" for "No" in the checklist. If significant environmental impacts are unclear, then the "evaluation" column is marked with an "X" for "Unknown" in the checklist.

(4) Overall Evaluation

The necessity of further environmental studies during the field work for the preparatory study is evaluated by summarizing the evaluation results of the above six items as shown below.

The overall evaluation is made as follows:

1) Even if one "Yes" is observed for an environmental issues in the "evaluation" column in checklist for the initial scoping, the issue for overall evaluation is then marked with an "X" for "Yes" In such a case, further careful study and scrutiny are required during the field work for the preparatory study focusing on such potential significant environmental impacts.

2) If "No" is observed for all the issues, the issue for overall evaluation is marked with an "X" for "No" . Nevertheless, in this case, the conclusion of this overall evaluation derived from the initial screening checklist should be confirmed during the field work for the preparatory study.

If a combination of "No" and "Unknown" are observed, "Hold" is marked for overall evaluation.In this case, further collection of information is required during field work for preparatory studies to conclusively identify the potential significant environmental impacts.

2.4.3 Sample Checklist for Initial Screening

A filled-in sample of a checklist for Initial Screening is attached for reference.

Example: Fishery Marketing

Form 3-1

Screening Checklist (Common Use for Initial and Joint Screening)

1. Study Title(Project Name)
   Study on Fishery Marketing System Improvement Plan in State B, Country A.

2. Name of Country
   Country A (State B)

3. Criteria for Initial Environmental Examination (IEE) and Environmental Impact of Assessment (EIA) in Recipient County.

Main Components (Developemnt Activities)	Type of Operation (Type of activities)		Condition	
	New	Rehabilitation	IEE	EIA
a. Capture Fishery	☐	☐		
b. Resource Enhancement	☐	☐		
c. Aquaculture	☒	☐	None	Over 5,000ha of land reclamation
d. Fishing Ports	☒	☐	None	
e. Processing	☒	☐	None	Waste disposition and disposal
f. Marketing	☐	☐		
g. Other	☐	☐		

Screening Checklist (Common Use for Initial and Joint Screening)

4. Screening Issues **Form 3-2**

Environmental Issues	Potential Significant Environmental Impact	Evaluations	Evaluation Bases
I. Social Environment			
1.Socio-economic Issues The project significantly affects socio-economic activities in and around the project site, such as daily human life, economic activities, transportation, community, institution, and customary practices.	1) Planned resettlement 2) Involuntary resettlement 3) Substantial changes in way of life 4) Conflict between communities and people 5) Impact on indigenous people 6) Increase of overland transportation 7) Population increase 8) Drastic change in population composition 9) Change in bases of economic activities 10) Reconversion and unemployment of economic activities 11) Increase of income diparity 12) Adjustment and regulation of fishing rights and water utilization rights 13) Changes in social and institutional structures 14) Changes in existing institutions and customs	× Yes No Unknown	
2.Health and Sanitary Issues The project†significantly affects hygiene †in and around the project area or induces water-related diseases.	1) Increased use of fisheries pharmaceuticals 2) Outbreak of endemic diseases 3) Prevalence of infectious diseases 4) Shellfish toxicity 5) Residual toxicity of fishery pharmaceuticals 6) Increase in waste matter and excrement	× Yes No Unknown	
3.Historic Remains, Cultural Assets and †Landscape Issues Some historically, culturally, aesthetically or scientifically important areas or socially valuable areas may be located in the project site.	1) Impairment †and demolition of historic remains †and †cultural assets 2) Damage to aesthetic sites 3) Impediment of mineral resource exploitation	× Yes No Unknown	
II.Natural Environment			
4.Biological and Ecological Issues Some habitats for rare species or ecological areas are in the project or surrounding areas.	1) Deterioration or degradation of vegetation 2) Impacts on important or indigenous fauna and flora 3) Degradation of biological diversity 4) Impacts on fisheries resources 5) Invasion and proliferation of hazardous species 6) Disappearance of tidal flats 7) Disappearance of sea grass beds 8) Destruction of mangrove forests 9) Destruction of coral reefs	× Yes No Unknown	
5. Soil and Land Resources The project significantly induces soil erosion and ground subsidence.	1) Soil erosion 2) Ground subsidence	× Yes No Unknown	
6.Hydrology and Water Quality Issues Project†significantly†affects hydrological regime of rivers, lakes and swamps, seas, ground-water, and water quality.	1) Changes in river hydrology 2) Changes in groundwater hydrology 3) Sedimentation 4) Changes in water hydrology due to changes of coastal (or lacustrine) topography 5) Changes in waves due to changes of coastal (or lacutrine) topography 6) Changes in drift sand due to changes of coastal (or lacstrine) topography 7) Impediments to navigation 8) Water contaminations 9) Contamination of bottom sediments 10) Eutrophication of water 11) Changes in water temperature 12) Offensive odor pollution 13) Noise and vibration pollution	× Yes No Unknown	
Overall Evaluation		× Yes No Hold	

2.5 Joint Screening and Scoping

2.5.1 Gist of Preparations

(1) Purpose

The purpose of joint screening is to determine the necessity of environmental considerations.If such consideration is necessary, joint scoping is carried out to clarify important significant environmental issues. Both joint screening and scoping are conducted by the preparatory study mission in cooperation with the responsible agencies of the recipient country during the field work. The responsible environmental agencies should participate in joint screening and scoping as necessary.

Prior to joint screening and scoping, information concerning the environmental agencies and related institutions and data collected during in-house work used in initial screening are,firstly to be, confirmed for accuracy in the recipient country. Supplementary information is then collected, which includes past and ongoing EIA and measures employed to avoid, mitigate or compensate for adverse impact in the vicinity of the project area and at similar project sites.

The recipient country's guidelines and screening and scoping formats are used, in principle,if such have been established, and the checklist in the Guidelines subsequently functions as a reference.

(2) Procedures for Joint Screening and Scoping

Joint screening is undertaken based on the Checklist (Attached **Form 3**) to determine whether the development study under consideration requires environmental consideration procedures, i.e., IEE, Pre EIA, or EIA. If such is judged necessary, joint scoping is then carried out.

The checklist for scoping (**Form 4**) prepared during the in-house work should be, if necessary, completed on the basis of additional information collected in field work, referring to the Reference Matrix Checklist for Scoping (**Tables 2-1** and **2-1**).

After the checklist for the joint scoping is completed, the identification of the proposed development project components and information on environmental site conditions obtained is then applied as criteria in evaluating and finally determining the scope of IEE, or EIA, or EIA

Checklist for the Joint Scoping

1.Development Components (from PD):
2.Type of Operation (from PD):
3.Environmentally Sensitive Area (from SD):
4.Study Title(Project Name):

Form 4-1

Social Environment

Environmental Issues *1	Environmental Significant Evaluation of Impact*2				Evaluation Base*3
	A	B	C	D	
I. Social Environment					
1. Socio-Economic Issues					
(1)Social Issues					
1) Planned resettlement					
2) Involuntary resettlement					
3) Substantial changes in way of life					
4) Conflict between communities and people					
5) Impact on indigenous people					
6) Increase of overland transportation					
7) Other					
(2)Demographic Issues					
1) Population increase					
2) Drastic change in population composition					
3) Other					
(3)Economic Issues					
1) Changes in base of economic activities					
2) Reconversion and unemployment of economic activities					
3) Increase of income disparity					
4) Other					
(4)Institutional and Customs Related Issues					
1) Adjustment and regulation of fishing rights and water utilization rights					
2) Changes in social and institutional structures					
3) Reformation in existing institutions and customs					
4) Other					
2. Health and Sanitary Issues					
1) Increased use of fishery pharmaceuticals					
2) Outbreak of endemic diseases					
3) Prevalence of infectious diseases					
4) Shellfish toxicity					
5) Residual toxicity of fishery pharmaceuticals					
6) Increase in waste matter and excrements					
7) Other					
3. Historic Remains, Cultural Assets and Landscape Issues					
1) Impairment and demolition of historic remains and cultural assets					
2) Damage to aesthetic sites					
3) Impediment of mineral resource exploitation					
4) Other					

*1 Definition of each environmental issue is presented in Chapter 2.9: Explanation of Environmental Issues.
*2 Applicable column with the following impact degree are marked with "X"
A: Significant environmental impact is unquestionably induced by the project.
B: Significant environmental impact is likely to be induced by the project.
C: Significant environmental impact is little induced by the project.
D: Significant environmental impact is not fully known (Further scrutiny is required and special regard will be paid to the fact that the significant environmental impact is to be clarified through further study.
*3 Potential environmental impacts are filled-in in reference to Chapter 2.9: Explanation of Environmental Issues.

Checklist for the Joint Scoping

Form 4-2

Natural Environment

Environmental Issues *1	Environmental Significant Evaluation of Impact*2				Evaluation Base*3
	A	B	C	D	
4. Biological and Ecological Issues					
1) Deterioration or degradation of vegetation					
2) Impacts on important or indigenous fauna and flora					
3) Degradation of biological diversity					
4) Impacts on fishery resources					
5) Invasion and proliferation of hazardous species					
6) Disappearance of tidal flats					
7) Disappearance of sea grass beds					
8) Destruction of mangrove forests					
9) Destruction of coral reefs					
10) Other					
5. Soil and Land Resources Issues					
(1)Soil					
1) Soil erosion					
(2) Land Resources					
1) Ground subsidence					
6. Hydrology and Water Quality Issues					
(1)Hydrology					
1) Changes in river hydrology					
2) Changes in groundwater hydrology					
3) Sedimentation					
4) Changes in water hydrology due to alterations in coastal (or lacustrine) topography					
5) Changes in waves due to alterations in coastal (or lacutrine) topography					
6) Changes in the drift sands due to alterations in coastal (or lacstrine) topography					
7) Impediments to navigation					
8) Other					
(2) Water Quality and Bottom Sediments					
1) Water contaminations					
2) Contamination of bottom sedimentsFeeding culture and untreated drainage					
3) Eutrophication of water					
4) Changes in water temperature					
5) Other					
(3)Atmospheric Issues					
1) Offensive odor pollution					
2) Noise and vibration pollution					
3) Other					

*1 Definition of each environmental issue is presented in Chapter 2.9: Explanation of Environmental Issues.
*2 Applicable column with the following impact degree are marked with "X"
A: Significant environmental impact is unquestionably induced by the project.
B: Significant environmental impact is likely to be induced by the project.
C: Significant environmental impact is little induced by the project.
D: Significant environmental impact is not fully known (Further scrutiny is required and special regard will be paid to the fact that the significant environmental impact is to be clarified through further study.
*3 Potential environmental impacts are filled-in in reference to Chapter 2.9: Explanation of Environmental Issues.

to be undertaken jointly by the preparatory study mission together with the related agencies in the recipient country.

(3) Reference Matrix Checklist for Scoping

The reference matrices are presented in attached **Tables 2-1** and **2-1** for social and natural environments. These matrices are prepared to assist the Guidelines users in the initial and the joint screening, and the joint scoping. However, the matrices should be used with discretion, depending on the specific environmental situation in and around the proposed project site.

Table 2-1 Reference Matrix Checklist for Scoping

Reference Matrix Checklist for Scoping

Social Environment

Environmental Issues *1	Environmental Significant Evaluation of Impact*2							Evaluation Base
	C.F.	R.E.	A.Q.	F.P.	P.S.	M.K.	O.T.	
I. Social Environment								
1. Socio-Economic Issues								
(1)Social Issues								
1) Planned resettlement	○	○	○	○	○	○		Regional comprehensive development (Improvement of fishery infrastructure)
2) Involuntary resettlement	△		△	△	△	△		Regional comprehensive development (Improvement of fishery infrastructure)
3) Substantial changes in way of life	◎	△	○	○	○	○		Effects on small scale fishermen
4) Conflict between communities and people	◎	△	○	○	○	○		Effects on small scale fishermen
5) Impact on indigenous people	◎	△	○	○	○	○		Effects on small scale fishermen
6) Increase of overland transportation				○	○	○		Improvement of fishery infrastructure
7) Other								
(2)Demographic Issues								
1) Population increase	○	△	○	○	○	○		Regional comprehensive development(Improvement of fishery infrastructure)
2) Drastic change in population composition	△	△	○	○	○	○		Regional comprehensive development(Improvement of fishery infrastructure)
3) Other								
(3)Economic Issues								
1) Changes in base of economic activities	◎	△	○	○	○	○		Resource exhaustion by exploitation
2) Reconversion and unemployment of economic activities	◎	△	○	○	○	○		Resource exhaustion by exploitation
3) Increase of income disparity								Oligopolistic marketing organization
4) Other	○	△	○	△	○	◎		
(4)Institutional and Customs Related Issues								
1) Adjustment and regulation of fishing rights and water utilization rights	◎	△	◎	○	○	△		Common property and fishing rights
2) Changes in social and institutional structures	◎	○	○	○	○	◎		Middlemen organizations
3) Reformation in existing institutions and customs	◎	○	○	○	○	◎		Regional common fishing right system
4) Other								
2. Health and Sanitary Issues								
1) Increased use of fishery pharmaceuticals	○	○	○		○			Antibiotic substances, etc.
2) Outbreak of endemic diseases	△		△		△			Parasites
3) Prevalence of infectious diseases			△	△	△	○		Inflow of labor
4) Shellfish toxicity	○	△	○	△	○	○		Prohibition of fishing and shipping control at outbreak of shellfish toxicity
5) Residual toxicity of fishery pharmaceuticals substances, etc.	○	○	○	○	○			Antifouling materials, antibiotic
6) Increase in waste matter and excrements	△	○	◎	◎	◎			Pollution, waste matters, and residues of fish bait around fishing ports
7) Other								
3. Historic Remains, Cultural Assets and Landscape Issues								
1) Impairment and demolition of historic remains and cultural assets			△	△				Facility constructions of large area
2) Damage to aesthetic sites		△	○	○				Constructions for facilities and establishments in sightseeing spots
3) Impediment of mineral resource exploitation								
4) Other								

Degree of association between project components and potential environmental impact.

◎: Closely related ○: Ordinarily related △ Occasionally related Blank: Impertinent

*1: Definition of each environmental issue is presented in Chapter 4: Explanation of Environmental Issues.

*2: Main Project components are abbreviated hereunder:

C.F:Capture Fisheries R.E:Resource Enhancement A.Q.:Aquaculture F.P.:Fishing Ports
P.S.:Processing M.K.:Marketing O.T.:Others

Table 2-2 Reference Matrix Checklist for Scoping

Reference Matrix Checklist for Scoping

Natural Environment

Environmental Issues *1	Environmental Significant Evaluation of Impact*2							Evaluation Base
	C.F.	R.E.	A.Q.	F.P.	P.S.	M.K.	O.T.	
4. Biological and Ecological Issues								
1) Deterioration or degradation of vegetation		△	○	○				Fishing, trading and transplanting of rare species
2) Impacts on important or indigenous fauna and flora	◎	◎	◎	○	△	◎		Fishing, trading and transplanting of rare species
3) Degradation of biological diversity	◎	◎	◎	◎	△			Excessive fisheries development
4) Impacts on fishery resources	◎	○	◎	◎	◎	◎		Transplantation of injurious fish and dissemination of fish disease
5) Invasion and proliferation of hazardous species		◎	◎					Facilities construction and reclamation of large areas
6) Disappearance of tidal flats			○	○				Facilities construction and reclamation of large areas
7) Disappearance of sea grass beds			○	○				Lumbering of mangrove forests
8) Destruction of mangrove forests			◎	◎		○		Destructive fishing
9) Destruction of coral reefs	○		△	○	○			
10) Other								
5. Soil and Land Resources Issues								
(1)Soil								
1) Soil erosion			△	△				
(2) Land Resources								
1) Ground subsidence			△					
6. Hydrology and Water Quality Issues								
(1)Hydrology								
1) Changes in river hydrology			○					Water intake
2) Changes in groundwater hydrology			○					Water intake
3) Sedimentation			○	◎	◎			Water intake
4) Changes in water hydrology due to alterations in coastal (or lacustrine) topography		△	○	◎	○			Fabrics
5) Changes in waves due to alterations in coastal (or lacutrine) topography		△	○	◎	○			Fabrics
6) Changes in the drift sands due to alterations in coastal (or lacstrine) topography		△	△	◎	○			Fabrics
7) Impediments to navigation	○	△	◎	○	○			Fabrics
8) Other								
(2) Water Quality and Bottom Sediments								
1) Water contaminations		○	◎	◎	◎			Feeding culture and untreated
2) Contamination of bottom sedimentsFeeding culture and untreated drainage		○	◎	◎	○			Feeding culture and untreated
3) Eutrophication of water		○	◎	○	○			Feeding culture and untreated
4) Changes in water temperature		△	○	○	○			Underground water intake
5) Other								
(3)Atmospheric Issues								
1) Offensive odor pollution			○	○	◎			Fish meal processing facilities
2) Noise and vibration pollution				○	○			Facility operations
3) Other								

Degree of association between project components and potential environmental impact.

◎: Closely related ○: Ordinarily related △ Occasionally related Blank: Impertinent

*1: Definition of each environmental issue is presented in Chapter 4: Explanation of Environmental Issues.

*2: Main Project components are abbreviated hereunder:

C.F:Capture Fisheries R.E:Resource Enhancement A.Q.:Aquaculture F.P.:Fishing Ports
P.S.:Processing M.K.:Marketing O.T.:Others

2.5.2 Checklist for the Joint Screening

(1) Checklist form for the Joint Screening

The form and the contents of the Checklist for Joint Screening (attached **Form 3**) are the same as the Checklist for Initial Screening and are filled in making the necessary modifications as required based upon the results of the field work.

(2) Filling in the Checklist for Joint Screening

Same as described previously for the Checklist for the Initial Screening.

(3) Evaluation of each Screening Item in Form 3-2

The Screening items, which consist of the six issues discussed under Initial Screening are evaluated as follows:

1) If "Yes" or "Hold" is observed for the overall evaluation, IEE or IEE and EIA are possibly further required, and thus scoping is required.

2) If "No" is marked for overall evaluation, IEE or IEE and EIA are not required.

2.5.3 Checklist for Joint Scoping

(1) Form of Checklist for the Joint Scoping

Joint scoping is conducted according to the attached Checklist for the Joint Scoping (**Form 4**) in order to identify only those significant environmental impacts among the range of various adverse impacts considered to be induced by implementation of the project.

(2) Filling in the Checklist for Joint Scoping

1) Applicable development components (see PD)

Relevant development components or activities should be filled-in.

2) Applicable type of operation (see PD)

Relevant type of operation should be filled-in.

3) Applicable environmentally sensitive areas (see SD)

Relevant environmentally sensitive area should be filled-in.

4) Evaluation of significant environmental impacts

On the basis of the results of the field work, the degree of possible impact is assessed and classified into one of four categories (A, B, C, or D), which is entered into the column of the Checklist form for joint scoping. Each environmental impact shown on the checklist is evaluate and then marked according to the following four categories:

A: Significant environmental impact is unquestionably induced by the project.

B: Significant environmental impact is likely to be induced by the project.

C: There is little possibility of significant environmental impact being induced by the project. Thus, IEE or EIA are unnecessary.

D: Significant environmental impact is not fully known (it cannot be confirmed at this stage whether substantial environmental impact is likely to occur)

2.5.4 Sample Checklist for Joint Screening and Scoping

(1) Filled-in Samples of Checklist for Joint Screening

Same as the filled-in sample shown previously in **Form 3** of the Checklist for initial screening.

(2) Filled-in Samples of Checklist for Scoping

Sample of checklist for scoping is attached hereinafter for reference (**Tables 2-3** and **2-4**).

Table 2-3 Example of Checklist for the Joint Screening

Checklist for the Joint Screening

1.Development Components (from PD):Marketing, Processing, and fishing ports
2.Type of Operation (from PD):New Development
3.Environmentally Sensitive Area (from SD):tidal flats, mangrove forests, and semi-closed wataer
4.Study Title(Project Name):

Form 4-1

Study on fishery marketing system improvement plan in State B, Country A.

Social Environment

Environmental Issues *1	Environmental Significant Evaluation of Impact*2				Evaluation Base*3
	A	B	C	D	
I. Social Environment					
1. Socio-Economic Issues					
(1)Social Issues					
1) Planned resettlement			○		Not applicable
2) Involuntary resettlement		○			Resettlement
3) Substantial changes in way of life		○			Welfare of women
4) Conflict between communities and people		○			Incoming and settlement of outsiders
5) Impact on indigenous people			○		Not applicable
6) Increase of overland transportation			○		Not applicable
7) Other					
(2)Demographic Issues					
1) Population increase			○		Slight influence
2) Drastic change in population composition			○		Slight influence
3) Other					
(3)Economic Issues					
1) Changes in base of economic activities			○		Slight influence
2) Reconversion and unemployment of economic activities			○		Slight influence
3) Increase of income disparity			○		Slight influence
4) Other					
(4)Institutional and Customs Related Issues					
1) Adjustment and regulation of fishing rights and water utilization rights			○		Not applicable
2) Changes in social and institutional structures	○				Influence on Chinese middlemen organizations
3) Reformation in existing institutions and customs	○				Special brokerage system
4) Other					
2. Health and Sanitary Issues					
1) Increased use of fishery pharmaceuticals			○		Not applicable
2) Outbreak of endemic diseases			○		Slight influence
3) Prevalence of infectious diseases			○		Slight influence
4) Shellfish toxicity			○		Not applicable
5) Residual toxicity of fishery pharmaceuticals			○		Not applicable
6) Increase in waste matter and excrements		○			Disposal for processed waste fluid
7) Other					
3. Historic Remains, Cultural Assets and Landscape Issues					
1) Impairment and demolition of historic remains and cultural assets			○		Not applicable
2) Damage to aesthetic sites			○		Not applicable
3) Impediment of mineral resource exploitation			○		Not applicable
4) Other					

*1 Definition of each environmental issue is presented in Chapter 2.9: Explanation of Environmental Issues.
*2 Applicable column with the following impact degree are marked with "X"
A: Significant environmental impact is unquestionably induced by the project.
B: Significant environmental impact is likely to be induced by the project.
C: Significant environmental impact is little induced by the project.
D: Significant environmental impact is not fully known (Further scrutiny is required and special regard will be paid to the fact that the significant environmental impact is to be clarified through further study.
*3 Potential environmental impacts are filled-in in reference to Chapter 2.9: Explanation of Environmental Issues.

Table 2-4 Example of Checklist for the Joint Screening

Checklist for the Joint Screening

Natural Environment **Form 4-2**

Environmental Issues *1	Environmental Significant Evaluation of Impact*2				Evaluation Base*3
	A	B	C	D	
4. Biological and Ecological Issues					
1) Deterioration or degradation of vegetation			○		Not applicable
2) Impacts on important or indigenous fauna and flora			○		Not applicable
3) Degradation of biological diversity			○		Not applicable
4) Impacts on fishery resources			○		Not applicable
5) Invasion and proliferation of hazardous species			○		Not applicable
6) Disappearance of tidal flats		○			Partial reclamation for fishing port construction
7) Disappearance of sea grass beds			○		Changes of coastal landform
8) Destruction of mangrove forests		○			Partial reclamation for fishing port construction
9) Destruction of coral reefs			○		Not applicable
10) Other		○			Fishing port construction to a lagoon
5. Soil and Land Resources Issues					
(1)Soil					
1) Soil erosion			○		Not applicable
(2) Land Resources					
1) Ground subsidence			○		Not applicable
6. Hydrology and Water Quality Issues					
(1)Hydrology					
1) Changes in river hydrology			○		Not applicable
2) Changes in groundwater hydrology			○		Not applicable
3) Sedimentation		○			Increaseeds turbidity
4) Changes in water hydrology due to alterations in coastal (or lacustrine) topography		○			Changes of coastal landform
5) Changes in waves due to alterations in coastal (or lacultrine) topography		○			Changes of coastal landform
6) Changes in the drift sands due to alterations in coastal (or lacstrine) topography		○			Changes of coastal landform
7) Impediments to navigation		○			Sediment on along the navigation route
8) Other					
(2) Water Quality and Bottom Sediments					
1) Water contaminations		○			Household pollution on vicinity of fishing port
2) Contamination of bottom sedimentsFeeding culture and untreated drainage		○			Household pollution on vicinity of fishing port
3) Eutrophication of water		○			Occurrence of de ad water areas
4) Changes in water temperature			○		Not Applicable
5) Other					
(3)Atmospheric Issues					
1) Offensive odor pollution		○			Originatibg from fishing processing facilities
2) Noise and vibration pollution				○	Unknown whether the noise originates from processing facilities
3) Other					

*1 Definition of each environmental issue is presented in Chapter 2.9: Explanation of Environmental Issues.
*2 Applicable column with the following impact degree are marked with "X"
A: Significant environmental impact is unquestionably induced by the project.
B: Significant environmental impact is likely to be induced by the project.
C: Significant environmental impact is little induced by the project.
D: Significant environmental impact is not fully known (Further scrutiny is required and special regard will be paid to the fact that the significant environmental impact is to be clarified through further study.
*3 Potential environmental impacts are filled-in in reference to Chapter 2.9: Explanation of Environmental Issues.

2.6 Overall Evaluation

2.6.1 Gist of Preparations

Any proposed project that does not obtained a "C" (little possibility of significant environmental impacts), on the scoping checklist, will be listed along with reasons for such grading on the Form of Overall Evaluation (attached **Form 5**).

- The necessity and scale decision of IEE and EIA are, using this overall evaluation form,based on project type and site for judgment conditions and are based on the cross yield perspective of scoping as written in JICA's " Report of the Study Group for the Sectoral Aid Program (Environment)" after careful cooperation with recipient countries. In considering proposals including M/P (master plans), unless environmental concerns are deemed unnecessary, the IEE will be in effect automatically.
- To ensure that there is full understanding and no disagreement among the concerned environmental survey groups, screening and scoping decisions are to be confirmed by the Cross-Field Perspective counterpart's office.

2.6.2 Judgment Conditions

(1)The Project Type and Site

1) Development study with Full EIA

Consideration of a development study with Full EIA is required if the following situation exists:

① The fishery development project area is tidal flats, mangrove forests, coral reefs, sea grass beds,or semi-enclosed water areas.

② The fishery development project includes large-scale and/or local but involving multi-projects.

③ The project is required to have full EIA under the recipient country's guidelines.

2) Development Study with EIA for limited fields

Development studies not covered in 1). However, if the development study is to come under "Environmentally Sensitive Areas Requiring Special Attention" in **Form 2** and is to be implemented directly in such areas, full EIA should be used as in 1).

3) Development study with IEE

If, upon scoping, significant environmental impact is determined as "not fully known" then IEE will be conducted by consultants in the early parts of the implementation stages of the development study (F/S or M/P) to determine whether to employ the EIA.

4) Pre EIA

If Pre EIA is deemed necessary according to the guidelines of the recipient country, depending upon the outcome, IEE or EIA may or may not be conducted.

(2)Cross-field Perspective

1) Whether there are foreseeable adverse effects to the sustainability of a production process based on the natural resources used.
2) Whether a project is harmful to human health.
3) Whether degradation or destruction of a living resources and their habitats are foreseeable.
4) Whether adverse impact would diminish any local people's lifestyle or living standards.

2.6.3 Sample Form of Overall Evaluation

Sample of Form of Overall Evaluation is attached hereinafter for reference.

Overall Evaluation for Fisheries Development

Form 5

Study Title(Project Name)

Environmental Issue *1	Rating *2	Direction of Further Study	Remarks
Overall Evaluation			

*1 Environmental issues are filled-in in reference to Chapter 2.9: Explanation of Environmental Issues.
*2 Rating of a potential impact is classified into one of the following:
A: Significant environmental impact is unquestionably induced by the project.
B: Significant environmental impact is likely to be induced by the project.
C: Significant environmental impact is little induced by the project.
D: Significant environmental impact is not fully known.

Example of Overall Evaluation for Fishery Development

Overall Evaluation for Fisheries Development

Form 5

Study Title(Project Name)

Study on fishery marketing system improvement plan in State B, Country A.

Environmental Issue *1	Rating *2	Direction of Further Study	Remarks
Involuntary resettlement	B	To investigate and discuss necessity and possibility of other solutions in the resettlement of residents in a target of area.	
Substantial changes in way of life	B	To investigate changes in lifestyle for women and aged people who engage in agriculture or fishing only.	
Conflict between communities and peoplene	B	To reconcile conflict between resident fishermen and w labores who settle from other communities.	
Changes in social and institutional structures	A	To consider the influence of Chinese brokerage organizations by means of improvement of distribution.	
Changes in existing institutions and customs distributive systems.	A	To understand the influence to the special brokerage organizations system by means of improvement of	
Increase in waste matter and excrement	B	To dispose waste water from the processing facilities and contaminated water around the fishing ports.	
Disappearance of tidal flat	B	To investigate the creation of new tidal flats to compensate the potential disappearance of 20ha tidal flats by due to development.	
Destruction of mangrove forests	B	To investigate influence of the partial cutting to construct facilities.	
Semi-closed water systems	B	To investigate potential environmental impact concerning fishing port contiguous to lagoons.	
Sedimentation	B	To investigate seasonal changes in sedimentation resulting from increased turbidity.	
Changes in revier hydrology	B	Necessity of long-term investigation on changes in flow due to impact on sedimentation.	
Changes in drift sand due to changes of coastal(or lacstrine) topography	B	Necessity of long-term investigation on changes in flow due to impacts on waves.	
Changes in waves due to changes of coastal (or lacutrine) topography	B	Necessity of long-term investigation on quantity and distribution of drifting sands due to changes of sedimentation, state of the sea, and waves.	
Impediment to navigation	B	To study counterplans to prevent disturbance of navigation route from sedimentation	
Water contamination	B	To prepare counterplans for polluted water from communities activities and facilities around the fishing ports, and waste water from fishing vessels.	
Contamination of bottom sediments	B	To study counterplans to mitigate outbreak of turbidity from fishing port facilities and pollution of bottom sedimentation from waste water and matters.	
Water contamination	B	Necessity of study on rate of water exchanges of semi -closed water areas where water eutrophication has resulted.	
Offensive odor pollution	B	To consider counterplans to mitigate offensive odor pollution due to processing of fish meal in fisheries processing facilities	
Noise and vibration pollution	D	Noises changes according to operation conditions of of fishery processing facilities; therefore it is difficult to conduct narrow studies of degree of impacts.	
Overall Evaluation		EIA for items rated "A" and "B" are carried out. The implementing body for EIA have to have full discussion with C/P body. It is also necessary to consider the timing of implementation for EIA, based upon results of EIA for the proposed plan.	

*1 Environmental issues are filled-in in reference to Chapter 2.9: Explanation of Environmental Issues.
*2 Rating of a potential impact is classified into one of the following:
A: Significant environmental impact is unquestionably induced by the project.
B: Significant environmental impact is likely to be induced by the project.
C: Significant environmental impact is little induced by the project.
D: Significant environmental impact is not fully known.

2.7 Implementation of S/W and M/M

2.7.1 Work Division for IEE and EIA in Implementation Stages of Development Studies

After joint scoping with the recipient country, if it is determined that the IEE or EIA are to be implemented, works must be divided between the study team and the counterpart (C/P). Basically the IEE and EIA will be conducted by C/P, but depending on the abilities of the C/P, budgetary limitations, and the scheduling of the environmental study, work must be divided as necessary, then recorded in S/W and M/M. Some examples of the division of work may tale the following form:

① C/P will conduct the IEE and/or EIA, and the JICA study team will provide technical advice and support.

② Both the JICA study team and C/P will share IEE and/or EIA, but conduct them separately.

③ The JICA study team will conduct all IEE and/or EIA.

2.7.2 Implementation

The results of joint screening, scoping, and work division, are to be described in S/W and M/M. Generally, the following descriptions are considered exemplary.

(1)Items to be Mentioned in S/W

As a result of discussions with C/P, if IEE and EIA are to be conducted (including cases where EIA is decided upon after IEE), C/P will conduct it, and it is not necessary to mention such work in the S/W, but these points should be confirmed in M/M (refer to "(2) items to be mentioned in M/M"). Except for such cases as discussed above, the following examples can be used for entries under the heading of "scope of study" .

① M/P Study

- If IEE is to be conducted, and the JICA study team is to conduct it, or is to share the work with C/P, enter "IEE will be conducted".

② M/P study and F/S

- If IEE and/or EIA are to be conducted, and the JICA study team is to conduct it, or is to share the work with C/P, enter "The IEE will be conducted during M/P study, and the EIA conducted during F/S "
- If IEE is necessary, but scoping for the EIA will prove difficult in preparatory studies, and the JICA study team or C/P is to conduct an environmental study, enter "IEE will be

conducted during the M/P study and if deemed necessary as a result of the IEE, the EIA will be conducted during F/S"

③ F/S

- If EIA is to be conducted, and the JICA study team itself is to do it, or is to share the work with C/P, enter "EIA will be conducted"
- If it is difficult to determine the necessity of the EIA in the preparatory study, IEE will be conducted at the initial stage of F/S. Again, if the JICA study team itself is to carry this out or share the work with C/P, enter "In the initial stage of F/S, IEE will be conducted. If, after IEE, EIA is deemed necessary, enter "EIA will be conducted" .

(2) Items to be mentioned in M/M

If there are points not mentioned in S/W but agreed upon with C/P, these points should be described in M/M. The following items may be described regarding environmental consideration.

① Results of joint screening

② Results of joint scoping

③ Information on implementation and review procedures of IEE/EIA/Pre EIA

④ Work division with C/P on the IEE/EIA/Pre EIA

⑤ What should the done if regulations for EIA are not provided for by the recipient country.

2.8 Preparation of the Preparatory Study Report

(1) Summary of results of preparatory studies

After completing the filed study, the preparatory study team must take the following steps:

1) Record results that concern environmental considerations, and make clear directions and recommendations for the main development study.
2) Report findings, not only for the implementation stages of a development study to be followed, but also for other JICA activities related to environmental consideration.
3) Compile information which is required to prepare TOR (terms of reference) for the implementation stage of the development study.

(2) Description of a Preparatory Study Report

The study team must, aside from reporting common items, describe the following items, concentrating on those of environmental consideration.

- The background and need for environmental consideration.
- The recipient country's laws and regulations on the environment and review procedures of IEE/EIA/Pre EIA.
- The findings of the field survey.
- PD and SD.
- Results of joint screening and scoping.
- The implementation arrangements and schedule for IEE/EIA/Pre EIA in the implementation stages of the development study.
- Results of discussion and agreement concerning IEE/EIA/Pre EIA in S/W and M/M .
- Information to prepare TOR for the implementation stages of the development study.
- Environmental data and information relating to the project.
- Problematic points concerning the implementation of environmental consideration.
- Opinions and recommendations for the implementation stage of the development study

(3)The necessary data for TOR for the implementation stages of the development study

The responsible division prepares TOR based on the results of the preparatory study.

(4)Report on environmental information concerning the project

Information and experience obtained during the preparatory and implementation stages of a development study are very important and useful for environmental consideration in the development study. Therefore a study team should report on the following information of the recipient country.

- "Environmental profile" of the recipient country.
- Environmental administration and institutional structure of a recipient country.
- Environmental standards and guidelines, etc. of a recipient country.
- Recipient country's policy and regulations on IEE/EIA/Pre EIA.
- General information on environment-related organizations of a recipient country.
- Outlines of IEE/EIA/Pre EIA conducted on similar projects in the past in a recipient country.
- Any other environment-related information

2.9 Explanation of Environmental Issues

This section provides explanation for the possible significant environmental impacts to be assessed in the screening and scoping procedures under the Guidelines. Each of the environmentalimpacts is followed in the scoping checklist. Information and guidance presented include: 1) definitions; 2) major potential impacts; 3)development activities generating impacts; 4)special considerations for environmental assessment, 5) mitigative measures; and 6) related studies required.

2.9.1 Socio-Economic Issues

(1) Social Issues

1) Planned Resettlement

Definition

One type of planned resettlement is defined as new land settlement implemented in fishery development projects, for purposes of port or construction of facilities for aquaculture, processing, or marketing. A second type of planned resettlement is land settlement due to the movement of fishermen.

Major Potential Impacts

Major potential impacts due to planned resettlement include:
Substantial socio-economic impacts to both new settlers and the current population;
Conflict between new settlers and the current population; and
Adverse impacts to the natural environment in and around the resettlement.

Development Activities Generating Impacts

Development activities generating negative impacts include:
Land expropriation; and
Planned and voluntary resettlement.

Special Considerations for Environmental Assessment

Special considerations include:
Consideration for socially vulnerable people such as ethnic minorities and the aged who adapt less easily to new environments and changes in way of life; and

Appropriate mitigative measures are requisite in areas where ethnic or tribal friction is anticipated.

Mitigative Measures

Mitigative measures include:

Selection of resettlement area based on desires and aspirations of the affected people;

Adequate provisions for housing and social infrastructures;

Adequate compensation including establishment of economic means and infrastructures;

Establishment of supporting systems for production and daily living activities of the affected people;

Covering of expenses for resettlement; and

Adequate support for the livelihood of affected people by providing employment opportunities through the implementations of projects.

Related Studies Required

Related studies required include:

Baseline data on present socio-economic conditions of setters and host population;

Natural and socio-economic environments in new settlement areas;

Immigration policy and other related government policies; and

Activities and capabilities of related government agencies, and opinions and activities of NGOs.

2) Involuntary Resettlement

Definition

Involuntary resettlement is defined as forced resettlement in which inhabitants are moved away from their original dwelling places for purposes of development projects.

Major Potential Impacts

Major potential adverse impacts due to involuntary resettlement include:

Significant socio-economic adverse impacts both to new settlers and current people;

Conflict between new settlers and current population; and

Adverse impacts on the natural environment in and around the settlement area.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Involuntary displacement of inhabitants by land expropriation, etc.

Special Considerations for Environmental Assessment

Special considerations for environmental assessment include:

Consideration for the socially vulnerable such as ethnic minorities and the aged who are less able to adapt to a new environment and changes in life;

Appropriate mitigative measures in areas where outbreaks of ethnic or tribal frictions are anticipated; and

Forced resettlement can cause great disruption to the lives of settlers who depend on the specific environment of their present dwelling place for their livelihood, and when the resettlement area is far from their present place of dwelling, environmental conditions there may differ substantially.

Mitigative Measures

Mitigative measures include:

Selection of resettlement area based on desires and aspirations of the affected people;

Adequate provisions for housing and social infrastructures;

Adequate compensation including establishment of economic means and infrastructures;

Establishment of supporting systems for production and daily living activities of the affected people;

Covering of expenses for resettlement; and

Adequate support of the livelihood of the affected people by providing employment

opportunities through the implementations of projects.

Related Studies Required

Related studies required include:

Baseline data on present socio-economic conditions of setters and host population;

Natural and socio-economic environments in new settlement areas;

Immigration policy and other related government actions; and

Activities and capabilities of related government agencies, and opinions and activities of NGOs.

3) Substantial Changes in Way of Life

Definition

Substantial changes in way of life are defined as changes which affect the daily living of inhabitants,and in particular changes related to the role of women in family and society brought about by fishery development projects.

Major Potential Impacts

Major potential adverse impacts include:

Alternation and disruption of traditional ways of life and social dynamics; and

Substantial adverse impacts on women and the aged.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Resettlement;

Changes in economic activities and occupations; and

Expansion or encroachment of adverse impacts of development into surrounding areas.

Special Considerations for Environmental Assessment

Rapid changes in way of life significantly affect the socially vulnerable, such as ethnic minorities and the aged;

Basic change should be made within the context of the traditional custom and values which have evolved within the natural and socio-economic environment of project areas; and

The impacts of development projects on women should also be studied with the aim of assessing: a) women's potential roles in development; b) impact on women's welfare and productivity; and c) policy framework and social, legal and custom-related practices regarding women's role.

Mitigative Measures

Mitigation measures include:

Development project should be formulated after duly considering the way of life of the affected people in order to avoid rapid changes in the traditional systems; and

The implementation of extension and training programs for improvement of life.

Related Studies Required

Related studies required include:

Baseline data on socio-economic conditions in project areas, including factors in the formation and values of traditional systems;

Interview surveys of the affected people, and of the socially vulnerable in particular, to grasp their desires and aspirations; and

Activities and capabilities of related government agencies, and opinions of related private organizations including NGOs.

4) Conflict between Communities and People

Definition

Conflict among communities and peoples refers to friction due to conflicting interests between beneficiaries and non-beneficiaries, people in favor of and those against development, new settlers and host population, people involved in development and outsiders, and people in a certain project areas and those affected in the surrounding areas.

Major Potential Impacts

Major potential adverse impacts include:

Conflicts or disputes among people; and

Significant adverse impacts on socially or politically vulnerable people such as indigenous people and ethnic minorities.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Intersettlement or close proximity of beneficiaries and non-beneficiaries;

Close proximity of those in support of and those against development;

Major income disparity; and

Migration or settlement of outsiders into project areas.

Special Considerations for Environmental Assessment

Special considerations include:

Presence of those who show consent for, or on the other hand opposition to development projects; and

Identification of desires, aspirations and concerns of related peoples, agencies and rural organizations.

Mitigative Measures

Mitigative measures include project formulation based on sufficient consideration of the social environment of project areas, desires and aspirations of related peoples, and harmony with surrounding environment as follows:

Monitoring of concerns or opinions of related peoples such as equitable distribution of benefit among people;

Monitoring of environmentalimpact, and study on and execution of mitigative measures; and

Consolidation of autonomy for communities and people in line with people's opinions.

Related Studies Required

Related studies requires include:

Baseline data on the social economy;

Interview surveys of affected people to grasp their desires and aspirations;

Public hearing on development projects; and

Activities and capabilities of related government agencies, and opinions of related private organizations including NGOs.

5) Impact on Indigenous People

Definition

Impact on indigenous peoples refers to the adverse effects of development on local communities composed partly or entirely of indigenous people including tribal groups, low-caste groups, or ethnic minorities.

Major Potential Impacts

Major potential adverse impacts include:

Serious threats to the existence of indigenous peoples such as impoverishment, disruption of lives and communities, and environmental degradation.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Insufficient considerations of interests and welfare of indigenous people, ethnic minorities, etc.;

Settlement or resettlement of the affected groups;

Stationing of construction labor and personnel in project areas; and

Increased access to dwelling areas of indigenous peoples.

Special Considerations for Environmental Assessment

There are several special factors to be considered in environmental assessment:

Indigenous people including ethnic minorities, tribal, etc. are in many cases in a socially and politically vulnerable position, and their desires and aspirations tend to be neglected in development; and

In general indigenous people depend heavily on the natural environment of their dwelling areas for their livelihood.

Mitigative Measures

Mitigative measures include:

Socio-economic measures adequately reflecting indigenous peoples' desires and needs;

Monitoring of concerns or opinions of the affected peoples; and

Monitoring of environmental impact, and study of how mitigative measures can be executed.

Related Studies Required

Related studies required include:

Baseline data on population distribution, socio-economic conditions and living status of indigenous people;

Interview surveys to grasp their aspirations and needs;

Studies on government policies affecting indigenous people including tribes, low-caste groups, ethnic minorities, etc.; and

Activities and capabilities of related government agencies, and opinions of related private organizations including NGOs.

6) Increase of Overland Transportation

Definition

Increase of overland transportation is defined as that which has adverse effect on local communities due to increase of constructive vehicles for development activities.

Major Potential Impacts

Major potential impacts include:

Interference of traffic to the local communities; and

Increase of traffic accidents.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Increase of vehicles for construction and transport.

Special Considerations for Environmental Assessment

Special considerations shall be given to how local traffic conditions may change with increase in vehicles used in construction and transport.

Mitigative Measures

Mitigative measures include:

Adequate traffic control and education reflecting desires and needs for local communities; and

Restrictions and supervisions.

Related Studies Required

Related studies required:

Road traffic conditions; and

Interview survey to grasp aspirations and needs of local peoples.

(2)Demographic Issues

1) Population Increase

Definition

Population increase is defined as significant population increase in project areas and/or surrounding areas due to development.

Major Potential Impacts

Major potential impacts include:

Conflict among local communities and people affected by development;

Adverse effects on social institutions and customs of affected people;

Deterioration of living environment of affected people; and

Environmental degradation of areas surrounding development projects.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Settlement or resettlement of affected groups; and

Stationing of construction labor and personnel in project areas and/or surrounding areas.

Special Considerations for Environmental Assessment

Rapid increase and decreases in population caused by migration of construction laborers can have significant impact on the natural and socio-economic environments of project areas, and specific considerations are thus required of impacts affected by population increases.

Mitigative Measures

Mitigation measures include:

Formulation of settlement plan with due consideration to aspirations of host populations;

Improvement or establishment of socio-economic infrastructures corresponding to an expected population increase;

Careful monitoring of possible deterioration of social fabric or value upheaval as a result of rapid population increase; and

Monitoring of environmental impacts, with studies of how mitigative measures can be executed.

Related Studies Required

Related studies required include:

Baseline data of the social economy in affected areas and natural environments in project areas and/or surrounding areas; and

Evaluation of the degree of reliance of affected people on the existing natural environment.

2) Drastic Change in Population Composition

Definition

Drastic change in population composition are defined as remarkable changes in population composition in project areas and/or surrounding areas due to development.

Major Potential Impacts

Major potential impacts include:

Conflict among local communities and people affected by development;

Adverse effects on social institutions and customs of affected people;

Deterioration of living environment of affected people; and

Decline in service levels of social infrastructure for affected people.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Settlement or resettlement of affected groups; and

Stationing of construction labor and personnel in project areas and/or surrounding areas.

Special Considerations for Environmental Assessment

Special considerations for environmental assessment must take into account that: rapid change in population composition of a society may potentially result in insufficiency of social infrastructures, or alteration of social institutions.

Mitigative Measures

Mitigative measures include:

Formulation of settlement plans with due consideration to aspirations of the host populations;

Improvement or establishment of socio-economic infrastructures corresponding to an expected population increase;

Careful monitoring of possible deterioration of social fabric or value upheaval as a results of rapid population increase; and

Monitoring of environmental impacts, with studies of execution of mitigative measures.

Related Studies Required

Related studies required include:

Baseline data on population composition and movement, social economy, and social infrastructures in project areas and/or surrounding areas.

(3)Economic Issues

1) Changes in Base of Economic Activities

Definition

Change in base of economic activities is defined as forced or involuntary relocation of economic bases such as fishing grounds, farmland, etc., due to project-related land expropriation, changes in land use regulations, and deterioration or depletion of bases for economic activities.

Major Potential Impacts

Major potential adverse impacts include:

Disappearance of traditional production systems;

Emergence of victims of development; and

Degradation of the natural environment in surrounding areas of development projects.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Land expropriation by development projects;

Destruction or disappearance of bases or grounds for fishing or aquaculture; and

Increased competition for resources due to population increase.

Special Considerations for Environmental Assessment

Provisions formulated on the basis of due consideration of aspirations and abilities of affected people are essential. The possibility of emergence of refugees or those otherwise victimized by development must be considered.

Mitigative Measures

Mitigative measures include:

Formulation of development plan based on due considerations of present economic environment in affected areas;

Provision of sufficient compensation and support measures for affected people; and

Monitoring of concerns or aspirations of affected people.

Related Studies Required

Related studies required include:

Baseline data on land use, productivity, living conditions in a project areas and/or surrounding affected areas, and aspirations and capabilities of affected people.

2) Reconversion and Unemployment of Economic Activities

Definition

This term is defined as forced or involuntary occupational change and detriments to labor opportunity due to land expropriation and loss or deterioration of bases of economic activities.

Major Potential Impacts

Major potential adverse impacts include:

Disappearance of traditional production systems;

Emergence of those victimized by development; and

Degradation of natural environment in surrounding areas of development projects.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Land expropriation by development projects;

Destruction or disappearance of bases or grounds for fishing or aquaculture; and

Increased competition for resources due to population increase.

Special Considerations for Environmental Assessment

Provisions formulated on the basis of due consideration of the aspirations and abilities of affected people are essential. The possibility of the emergence of refugees or those otherwise victimized by development must be considered.

Mitigative Measures

Mitigative measures include:

Formulation of development plan based on due considerations of the present economic environment in affected areas;

Provision of sufficient compensation and support measures for affected people;

Monitoring of concerns or aspirations of affected people.

Related Studies Required

Related studies required include:

Baseline data on land use, productivity, living conditions in a project areas and surrounding affected areas; and

Examination of the aspirations and capabilities of affected people.

3) Increase of Income Disparity

Definition

This term is defined as increase in income disparity among groups brought about by development; it implies relative impoverishment of the economically vulnerable.

Major Potential Impacts

Major potential impacts are include:

Emergence and increase of economically vulnerable people.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Unequal distribution of development benefits; and

Lack of due considerations of those with vulnerable economic status.

Special Considerations for Environmental Assessment

Special considerations for environmental assessment should take into account the adequate distribution of development benefits to traditional small-scale fishermen.

Mitigative Measures

Mitigative measure include:

Formation of projects which do not result in to impartial distribution of development benefits and provisions for those of vulnerable economic status;

Monitoring of population changes after commencement of construction; and

Monitoring of environmental impacts, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required should include the examination of baseline data on land and water tenure systems, actual conditions and the scale of the economy for traditional small-scale fishing, and actual conditions of the bases of economic activities in project areas.

(4)Institutional and Customs Related Issues

1) Adjustment and Regulation of Fishing Rights and Water Utilizati on Rights

Definition

This term is defined as the effect of adverse development effects on fishing rights or water utilization rights and the necessary adjustments or regulations required to rectify the same.

Major Potential Impacts

Major potential impacts include:

Disturbance of existing fishing rights and water utilization rights;

Involuntary abandonment and relocation of fishing grounds;

Occurrence of water shortages;

Occurrence of water eutrophication; and

Conflict or disputes among local communities or affected people.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Intake of water for aquaculture;

Reclamation of the foreshore;

Preparation of a land for aquaculture farms; and

Occurrence of water pollution.

Special Considerations for Environmental Assessment

Special considerations are required because the negative impacts of projects in many cases are manifested outside of project areas, and victims are not necessarily found within the areas benefiting from a project.

Mitigative Measures

Mitigative measures include:

Adjustments or provisions based on due to consideration of the aspirations of affected people;

Modification of development plans;

Formulation and implementation of appropriate countermeasures;

Monitoring of environmental impacts, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required include:

Investigation of existing vested rights such as fishing rights and water utilization rights;

Baseline data on fishing or water utilization in and around project areas;

Studies on the socio-economic value of such vested rights; and

Studies on the reconciliation capabilities of related government agencies.

2) Changes in Social and Institutional Structures

Definition

This term is defined as changes caused by development in social and institutional structures as a result of establishment of new, or modification of existing, rural organizations.

Major Potential Impacts

Major potential adverse impacts include:
Disintegration of traditional rural organizations;
Conflict among local communities or affected people;
Alienation of socially-disadvantaged or vulnerable groups; and
Creation of poorly-functioning organizations.

Development Activities Generating Impacts

Development activities generating adverse impacts include:
A insufficient consideration of traditional rural organizations and social institutions; and
Creation of organizations without due attention to the aspirations of the affected people.

Special Considerations for Environmental Assessment

Existing formal and informal rural organizations are assumed to have evolved naturally as a result of socio-economic conditions in project areas, and factors of formation, function,and value structure of existing organizations should be carefully reviewed in the establishment or modification of organizations.

Mitigative Measures

Mitigative measures include:
Planning based on due consideration of the aspirations of affected people, existing institutions, and customs;
Establishment of adequate support measures;
Introduction of staged development;
Dissolution of conflict among people caused by induced reorganization of societies;
Monitoring of environmental impacts, and studies on how to execute mitigative measures.

Related Studies Required

Related studies required include:
Studies on existing organizations in project areas;

Baseline data on the social economy;

Interview surveys to grasp the aspirations and needs of the affected people; and

Studies on the functions and capabilities of related government agencies.

3)Reformation in Existing Institutions and Customs

Definition

This term is defined as changes in existing institutions and customs involved in or induced by development activities.

Major Potential Impacts

Major potential impacts include:

Undesirable alteration of existing institutions, systems and customs;

Disappearance of traditional practices; and

Undesirable establishment of new institutions or restructuring of existing institutions and customs.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Introduction of new institutions and systems of restructuring of the same;

Alteration of ways of life of local communities or of affected people; and

Introduction of new systems or institutions that the neglect traditional practices and aspirations of affected people.

Special Considerations for Environmental Assessment

Understanding is of existing institutions, systems and customs within the context of the social economy of project areas is essential, and rapid alteration of the same without due consideration to traditional practices and aspirations of the population will result in socio-economic upheaval in project areas.

Mitigative Measures

Mitigative measures include:

Planning based on due considerations on aspirations of affected people, existing institutions,and customs;

Establishment of adequate support measures;

Introduction of staged development; and

Monitoring of environmental impacts, and studies on execution of mitigative measures.

Related Studies Required

Related studies required include:

Studies on existing organizations in project areas;

Baseline data on the social economy;

Interview surveys to grasp the aspirations and needs of the affected people; and

Studies on the functions and capabilities of related government agencies.

2.9.2 Health and Sanitary Issues

1) Increased Use of Fishery Pharmaceuticals

Definition

This term is defined as increased use of pharmaceuticals to prevent disease in cultured fish and shellfish stocks and to preserve freshness of fish and shellfish prior to shipment.

Major Potential Impacts

Major potential impacts include:

Emergence of chemical-resistant bacteria;

Increased application of pharmaceuticals;

Decrease in numbers of species and population of insects and small animals;

Increased vulnerability of the ecosystem; and

Accumulation of chemicals in fish and shellfish muscle.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

High density aquaculture;

Poor sanitary management in aquaculture farms; and

Chemical treatments of cultured fish and shellfish prior to shipment.

Special Considerations for Environmental Assessment

Culture operations carried out at aquaculture facilities aged from continuous use or intensive and high density culture are prone to outbreaks of diseases, and guidelines for adequate use of pharmaceuticals should be be prepared.

Mitigative Measures

Mitigative measures include:

Management planning for appropriate aquaculture;

Establishment and extension of disease control measures;

Monitoring of environmental impacts, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required include:

Disease surveys;

Studies on environmental impacts on aquaculture farms; and

Studies on systems and capabilities of available extension services regarding application methods of pharmaceuticals.

2) Outbreak of Endemic Diseases

Definition

This is defined as spreading of endemic diseases as a result of the adverse effects of development.

Major Potential Impacts

Major potential adverse impact include:

Outbreak and spreading of endemic diseases.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Creation of environments conductive to the propagation of pathogenic agents; and

Infestation originating from areas outside of the project areas due to increase in the traffic of human beings and animals.

Special Considerations for Environmental Assessment

Considerations are required regarding the inadvertent creation of favorable habitats for pathogenic agents due to development and changes in the sanitary environment due to an increase in traffic of human beings and animals.

Mitigative Measures

Mitigative measures include:

Studies on the possibility of outbreak of endemic diseases and measures to control the same;

Monitoring of changes in fauna and flora due to the alteration of the natural environment; and

Monitoring of environmental impacts, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required include:

Studies on pathogenic insects infestation and other agents in surrounding and/or related areas; and

Case studies of similar projects.

3)Prevalence of Infectious Diseases

Definition

Prevalence of infectious disease is defined as spreading of infectious diseases attributable to the adverse effects of development.

Major Potential Impacts

Major potential adverse impact include:

Outbreak and spreading of infectious diseases.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Creation of an environment conductive to the propagation of pathogenic agents; and

Introduction and spreading of pathogenic agents from outside a project area due to increase in traffic of human beings and animals.

Special Considerations for Environmental Assessment

Considerations are required regarding the inadvertent creation of favorable habitats for pathogenic agents due to development and changes in sanitary conditions due to an increase in traffic of human beings and animals.

Mitigative Measures

Mitigative measures include:

Studies on the possibility of the outbreak of infectious diseases and control measures for the same;

Dissemination of information on health and sanitation; and

Monitoring of environmental impacts, and study of the execution of mitigative measures.

Related Studies Required

Related studies required include:

Studies on the prevalence of infectious diseases caused by pathogenic insects and other agents in surrounding and/or related areas; and

Case studies of similar projects.

4)Shellfish Toxicity

Definition

This term is defined as toxicity of natural and cultured shellfish consumed as food.

Major Potential Impacts

Major potential adverse impacts include:

Consumption of toxic shellfish which may cause diarrhea and paralysis, and in certain cases, death.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Increase in number of shellfish aquaculture and collective fishery; and

Emergence of toxic plankton causing shellfish toxicity.

Special Considerations for Environmental Assessment

Considerations must be given to information on the emergence of toxic plankton and development of shellfish toxin.

Mitigative Measures

Mitigative measures include:

Studies on the possibility of development of shellfish toxin and measures to control the same;

Control and suspension of shipping toxic shellfish; and

Monitoring of environmental impacts, and studies on execution of mitigative measures.

Related Studies Required

Related studies required include:

Studies on the emergence of shellfish toxicity in surrounding and/or related areas; and

Studies on the distribution of toxic plankton.

5)Residual Toxicity of Fishery Pharmaceuticals

Definition

Residual toxicity of fishery pharmaceuticals is defined as accumulation of fishery pharmaceuticals in the natural environment and within the muscle of cultured fish and shellfish.

Major Potential Impacts

Major potential impacts include:

Accumulation of high concentration of residual toxicity of fishery pharmaceuticals causes harmful effects in human beings and animals, and adverse impacts on the natural environment.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Overdosage of fishery pharmaceuticals applied in concurrence with disease outbreak in cultured fish and shellfish;

Limited application or total lack of regulations to the control toxic fishery pharmaceuticals; and

Use of antifouling materials for fishing vessels, fishing nets, and aquaculture materials.

Special Considerations for Environmental Assessment

Considerations are required regarding the establishment of institutinal systems to be advised on adequate use of fishery pharmaceuticals.

Mitigative Measures

Mitigative measures include:

Defining of criteria for fishery pharmaceuticals of high residual toxicity;

Strict regulations and supervisions on use and marketing of the fishery pharmaceuticals;

Enforcement of the said regulattions on use and marketing; and

Establishment of systems for the detection and inspection of residual toxicity of fishery pharmaceuticals.

Related Studies Required

Related studies required include:

Surveys of fishery pharmaceuticals in use on the market and regulations for fishery

pharmaceuticals;

Studies on guidance systems for measures to control fish disease; and

Studies on systems for detection and inspection of residual toxicity of fishery pharmaceuticals.

6)Increase in Waste Matter and Excrement

Definition

This term is defined as an increase in waste matter and excrements due to the consequences of fishery development including construction of fishery-related facilities.

Major Potential Impacts

Major potential adverse impacts include:

Pollution of water quality and bottom sediment; and

Water eutrophication.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Preparation of land for aquaculture farms; and

Construction including the fishery processing factories.

Special Considerations for Environmental Assessment

Special considerations for environmental assessment include:

The possibilities of water pollution and declining water and bottom sediment quality resulting from the accumulation of unconsumed and feed used in aquaculture operations; and

Disposal of waste matter and excrements from fish processing factories.

Mitigative Measures

Mitigative measures include:

Disposal planning for waste matters and excrements;

Effective feeding plans;

Measures to improve bottom sediment; and

Monitoring of environmental impacts, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required include:

Studies on regulations of disposal for waste matter and waste water discharge;

Studies on environmental conditions in affected areas; and

Studies on existing measures and capacities for disposal of waste matter and excrements.

2.9.3 Historic Remains, Cultural Assets and Landscape Issues

1)Impairment and Demolition of Historic Remains and Cultural Assets

Definition

This term is defined as direct or indirect impairment or destruction of sites, structures, and remains of archaeological, historical, religious, cultural, or aesthetic value as a result of development.

Major Potential Impacts

Major potential impacts include:

Impairment or destruction of historic remains, cultural assets, etc.;and

Loss of tourist resources.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Impairment or destruction due to construction, i.e., fishing ports, fishery processing facilities, etc.;

Impairment due to preparation of land for aquaculture farms; and

Impairment due to increased traffic of vehicles and vessels.

Special Considerations for Environmental Assessment

Special considerations include:

Comprehensive countermeasures based on identification of distribution, value, preservation policies, and existing conservation measures for historic remains and cultural assets are essential.

Mitigative Measures

Mitigative measures include:

Protection or relocation of affected remains, etc.;

Strengthening of preservation and management of the same;

Monitoring of environmental impacts, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required include:

Surveys of distribution, conditions, value, and distinctive features of remains, etc.; and

Studies on government conservation policies, and function and capabilities of related government agencies for management and conservation.

2) Damage to Aesthetic Sites

Definition

This term is defined as direct or indirect adverse effects on aesthetic features of the environment as a result of development.

Major Potential Impacts

Major potential adverse impacts include:

Degradation of aesthetic features;

Creation of inharmonious views; and

Loss of tourist resources.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Development activities involving disturbance or modification of earth surfaces; and

Construction of structures inharmonious to scenery at a site.

Special Considerations for Environmental Assessment

The clarification and identification of distribution, value, preservation policies, and existing conservation measures for aesthetic sites are essential.

Mitigative Measures

Mitigative measures include:

Selection of particular scenery or sites to be preserved;

Formulation of plans in consideration of the conservation of scenery;

Monitoring of environmental impacts, and studies on the execution of mitigative measures; and

Restoration of affected scenery.

Related Studies Required

Related studies required include:

Surveys of distribution, value, and distinctive features of the particular scenery or site;

Studies on government conservation policies and the functions and capabilities of related government agencies for management and conservation.

3) Impediment of Mineral Resource Exploitation

Definition

This term is defined as impediment of exploitation of mineral resources due to development activities.

Major Potential Impacts

Major potential impacts include:

Impediment of mineral resources development.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Construction of large-scale structures blocking access to deposits such as fishing port or fish processing facilities.

Special Considerations for Environmental Assessment

Preliminary investigation on the distribution of deposits of mineral resources and consultations with related agencies are necessary when such resources are predicted to exist.

Mitigative Measures

Mitigation measures include:

Adequate investigations;

Alteration of project areas;

Implementation of necessary provisions when unanticipated finds are made; and

Studies on socio-economic impacts.

Related Studies Required

Related studies required include:

Investigation of mineral resources distribution; and

Consultation with related government agencies.

2.9.4 Biological and Ecological Issues

1) Deterioration or Degradation of Vegetation

Definition

This term is defined as direct or indirect deterioration or changes in flora and fauna due to development activities.

Major Potential Impacts

Major potential impacts include:

Reduction of valuable or important fauna and flora;

Reduction of biological diversity; and

Degradation of scenery.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Increased effects of alteration of land use, removal or cutting of vegetation cover, human activities detrimental to forest areas including encroachment;

Effects of development activities on surrounding areas; and

Increases in number of affected people.

Special Considerations for Environmental Assessment

Special considerations include:

Possible deterioration of flora and fauna, changes in vulnerable ecosystems or habitats of important or indigenous species; and

The potential occurrence of natural disasters in protected forest areas such as landslides.

Mitigative Measures

Mitigative measures include:

Appropriate land use planning;

Establishment of preserved areas or buffer zones;

Project modification;

Studies of construction methods and duration;

Restrictions on land use; and

Monitoring of environmental impacts, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required include:

Vegetation and soil surveys;

Surveys on existing utilization of plant resources; and

Socio-economic baseline data.

2)Impacts on Important or Indigenous Fauna and Flora

Definition

This term is defined as adverse effect such as reduction or extinction of important or indigenous animal and plant species due to development activities.

Major Potential Impacts

Major potential adverse impacts include:

Reduction or extinction of important or indigenous species.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Development activities in or around the habitats of subject species involving land reclamation, and preparation of sites of resource enhancement and aquaculture facilities; and

By catch of certain species following introduction of new fishing technology.

Special Considerations for Environmental Assessment

Special considerations include:

Habitats of subject species should be carefully studied; and

By catch of certain species by due to employment of new fishing technology should be also carefully examined.

Mitigative Measures

Mitigative measures include:

Establishment and management of conservation areas;

Introduction of conservation measures;

Project modification;

Relocation of important and indigenous species; and

Monitoring of environmental impacts, and studies on and the execution of mitigative measures.

Related Studies Required

Related studies required include:

Studies on the distribution of important or indigenous species; and

Studies on government conservation policies, and functions and capabilities of related government agencies.

3) Degradation of Biological Diversity

Definition

This term is defined as reduction or extinction of the biological diversity resulting from the destruction of habitats or changes in environment due to development activities.

Major Potential Impacts

Major potential adverse impacts include:

Simplification of biological diversity and increase in vulnerability of the ecosystem due to the reduction or disappearance of certain species, varieties, races, or gene resources of indigenous flora and fauna.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Development activities in or around the habitats of subject species involving land reclamation, and preparation of sites of resource enhancement and aquaculture facilities; and

By catch of certain species by introduction of new fishing technology.

Special Considerations for Environmental Assessment

Development activities generating adverse impacts include:

Development activities in or around the habitats of wide varieties of useful, valuable or indigenous fauna and flora involving sea grass beds, tidal flats, coral reefs, mangrove forest, etc.; and

Over-exploitation and by catch of subject species by introduction of new fishing technology.

Mitigation Measures

Mitigation measures include:

Identification of distribution of important fauna and flora;

Establishment and management strengthening of conservation areas;

Introduction of conservation measures;

Project modification;

Regulations and management for fishing activities;

Relocation of important and indigenous species; and

Monitoring of environmental impacts, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required include:

Ecological surveys;

Land and resource use surveys;

Studies on the distribution of similar ecosystems in a certain country or region; and

Studies on government conservation policies, and functions and capabilities of related government agencies.

4) Impacts on Fishery Resources

Definition

This term is defined as adverse impacts on fishery resources due to development activities.

Major Potential Impacts

Major potential impacts include:

Reduction of fishery resources; and

Reduction of catch in existing fishery.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Development activities in or around the habitats of subject species involving land reclamation, and preparation of sites of resource enhancement and aquaculture facilities;

Over exploitation and by catch of subject species by introduction of new fishing technology; and

Introduction of new species for transplant or resource enhancement activities.

Special Considerations for Environmental Assessment

Special considerations include:

Development activities in or around the habitats of wide varieties of useful, valuable or indigenous fauna and flora including sea grass beds, tidal flats, coral reefs, mangrove forest, etc.;

Over-exploitation and by catch of subject species by introduction of new fishing technology; and

Depletion of existing or indigenous species due to introduction of new species for resource enhancement activities.

Mitigative Measures

Mitigative measures include:

Establishment and management strengthening of conservation areas;

Introduction of conservation measures;

Project modification;

Regulations and management of fishing activities and fishery resources; and

Monitoring of environmental impacts, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required include:

Fishery resource surveys;

Investigations on actual conditions of fishery; and

Studies on government fishery policy, and functions and capabilities of related government agencies.

5) Invasion and Proliferation of Hazardous Species

Definition

This term is defined as introduction of pathogenic agents or spreading of hazardous species due to the creation of an environment conductive to their propagation.

Major Potential Impacts

Major potential impacts include:

Outbreak or spread of pests and diseases affecting fish and shellfish used in resource enhancement and aquaculture.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Introduction of exotic species;

Increased traffic resulting from the movement of human beings and livestock along with equipment and crops; and

Creation of an environmental conductive to habitation by hazardous species.

Special Considerations for Environmental Assessment

Special considerations include:

Management planning of environments for sites of resource enhancement and locations of aquaculture farms; and

Introduction of exotic species.

Mitigative Measures

Mitigative measures include:

Adequate management planning of environments for sites of resource enhancement and locations of aquaculture farms;

Appropriate introduction of exotic species;

Appropriate use of fishery pharmaceuticals; and

Monitoring of environmental impacts, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required include:

Studies on the occurrence of fish diseases; and

Examination of case studies for similar projects.

6) Disappearance of Tidal Flats

Definition

This term is defined as extinction of tidal flat due to direct destruction by development activities such as land reclamation or due to indirect effects including changes in hydrological regime.

Major Potential Impacts

Major potential impacts include:

Extinction of or decrease in tidal flats;

Reduction or extinction of useful, valuable, and indigenous species;

Reduction or extinction of nursery grounds for larval fish or shellfish;

Reduction or extinction of habitats or feeding grounds for migratory birds; and

Degradation of efficiency for water clarifying functions.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Development activities in or around the habitats of subject species involving land reclamation, and preparation of sites of resource enhancement and aquaculture facilities; and

Changes in hydrological regime.

Special Considerations for Environmental Assessment

Special considerations include:

Valuable ecosystems which are habitats for various species; and

Water clarifying systems.

Mitigative Measures

Mitigative measures include:

Appropriate land use and drainage plans;

Establishment or strengthening of management systems of conservation areas and buffer zones;

Baseline surveys of distribution of important fauna and flora;

Studies on constructive methods; and

Monitoring of environmental impacts, and restrictions on land use.

Related Studies Required

Related studies required include:

Studies on the distribution of tidal flats and their ecosystems;

Land use surveys;

Hydrological surveys; and

Studies on government conservation polices, and functions and capabilities of related government agencies.

7) Disappearance of Sea Grass Beds

Definition

This term is defined as the extinction of sea grass bed due to direct destruction by development activities such as land reclamation or due to indirect effects including changes in hydrological regime.

Major Potential Impacts

Major potential impacts include:

Reduction or extinction of spawning grounds for adult fish or shellfish and nursery grounds for larvae.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Development activities in or around the habitats of subject species involving land reclamation, and preparation of sites of resource enhancement and aquaculture facilities; and

Changes in hydrological regime.

Special Considerations for Environmental Assessment

Special considerations for environmental assessments include:

Valuable ecosystems with spawning grounds for adult fish and shellfish and nursery grounds for larvae.

Mitigative Measures

Mitigative measures include:

Appropriate land use and drainage plans;

Establishment or strengthening of management of conservation areas and buffer zones;

Baseline surveys of distribution of important fauna and flora;

Studies on constructive methods; and

Monitoring of environmental impacts, and restrictions on land use.

Related Studies Required

Related studies required include:

Studies on distribution of sea grass beds and their ecosystem;

Land use surveys;

Hydrological surveys; and

Studies on government conservation polices, and functions and capabilities of related government agencies.

8) Destruction of Mangrove Forests

Definition

This term is defined as the decline of mangrove forests attributable to the direct destruction by development activities, or to deterioration of supporting environmental factors.

Major Potential Impacts

Major potential adverse impacts include:

Disappearance of mangrove forests;

Decrease and extinction of useful, valuable, or indigenous fauna and flora;

Reduction or extinction of nursery grounds for larval fish and shellfish .

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Development activities in or around the habitats of subject species involving land reclamation, and preparation of sites of resource enhancement and aquaculture facilities; and

Changes in hydrological regime.

Special Considerations for Environmental Assessment

Special considerations include:

Valuable ecosystems in which are contained nursery grounds for larval fish, shellfish, and other species and abundance of fishery resources.

Mitigative Measures

Mitigative measures include:

Appropriate land use and drainage plans;

Establishment or strengthening of management systems for conservation areas and buffer zones;

Baseline surveys of distribution of important fauna and flora;

Studies on constructive methods; and

Monitoring of environmental impacts, and restrictions on land use.

Related Studies Required

Related studies required include:

Studies on the distribution of mangrove forests and their ecosystems;

Land use surveys;

Hydrological surveys; and

Studies on government conservation polices, and functions and capabilities of related government agencies.

9) Destruction of Coral Reefs

Definition

This term is defined as encroachment due to direct destruction, or damage to and deterioration of the supporting environment cause by sedimentation, etc.

Major Potential Impacts

Major potential adverse impacts include:

Disappearance of coral reefs;

Reduction or extinction of useful, valuable, or indigenous fauna and flora;

Reduction or extinction of nursery grounds for larval fish and shellfish;

Loss of aesthetic features or recreational sites; and

Degradation and loss of value of fishing grounds or sightseeing areas.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Development activities in or around the habitats of subject species involving land reclamation, construction activities causing increased water turbidity, and preparation of sites involving resource enhancement and aquaculture facilities; and

Changes in hydrological regime.

Special Considerations for Environmental Assessment

Special considerations include:

Valuable ecosystems harboring nursery grounds for fish, shellfish and other species;

High sightseeing value and aesthetic features in certain areas; and

Fishing grounds in which traditional fishing gears are employed.

Mitigative Measures

Mitigative measures include:

Establishment or strengthening of management systems for conservation areas;

Due consideration to fishermen;

Project modification;

Baseline surveys of distribution of important fauna and flora;

Studies on constructive methods; and

Monitoring of environmental impacts.

Related Studies Required

Related studies required include:

Investigation on the distribution and ecology of coral reefs;

Studies on the economic value of coral reefs and their interrelationship with economic activities in the same areas; and

Studies on government conservation polices, and functions and capabilities of related government agencies.

2.9.5 Soil and Land Resources Issues

(1)Soil

1)Soil Erosion

Definition

This term is defined as the washing or blowing away of soil from the earth surface by the action of rain, running water or wind etc. Soil erosion is aggravated by man-made activities, and such erosion is called an accelerated erosion.

Major Potential Impacts

Major potential impacts include:

Land deterioration and desertification;

Destruction of buildings;

Adverse impacts on lower river basin areas (sedimentation and turbidity).

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Removal of vegetation cover; and

Changes in waves caused by man-made structures such as breakwaters.

Special Considerations for Environmental Assessment

Special considerations assessments include:

Characteristics of precipitation and wind and plants covers should be examined carefully; and

Removal of vegetation on sloping lands and light soils during rainy and windy seasons should be also considered.

Mitigative Measures

Mitigative measures include:

Appropriate land use planning;

Introduction of soil conservation measures;

Project modification;

Studies on construction methods and duration; and

Monitoring of environmental impacts, and restrictions on land use.

Related Studies Required

Related studies required include:

Surveys and investigation of vegetation, topography, geology, soil, land use, characteristics of precipitation and wind, and areas degraded by landslide and erosion.

(2) Land Resources

1)Ground Subsidence

Definition

This term is defined as depression of ground level caused by the dehydration or drying of wetlands, or excessive exploitation of groundwater.

Major Potential Impacts

Major potential adverse impacts include:

Subsidence of canals or certain structures; and

Deterioration of land drainability.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Excessive use of groundwater in sites of resource enhancement and aquaculture farms.

Special Considerations for Environmental Assessment

Excessive exploitation of groundwater in sites of resource enhancement and aquaculture farms should be carefully examined.

Mitigative Measures

Mitigative measures include:

Adequate sizing of sites of resource enhancement and aquaculture farms, and establishment of management plans for groundwater intake; and

Monitoring of environmental impacts.

Related Studies Required

Related studies required include:

Surveys and investigation of geology, soil, hydrology, groundwater and its utilization, etc.

2.9.6 Hydrology and Water Quality Issues

(1)Hydrology

1) Changes in River Hydrology

Definition

This term is defined as the alteration of river discharge or water level as resulting from water intake or discharge.

Major Potential Impacts

Major potential impacts include:

Change of maintenance flow;

Violation of the integrity of vested water rights in lower basin areas; and

Adverse impacts on existing flora and fauna, and fishery activities.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Water intake and discharge in sites of resource enhancement and aquaculture farms.

Special Considerations for Environmental Assessment

Seasonal changes in river water level and discharge before and after implementation of a project should be carefully examined.

Mitigative Measures

Mitigative measures include:

Adequate scaling of resource enhancement and aquaculture activities and establishment of management plans for intake water; and

Monitoring of environmental impacts.

Related Studies Required

Related studies required include:

Studies on existing water rights, intake structures, state of water flow, and fishing activities.

2) Changes in Groundwater Hydrology

Definition

This term is defined as changes in the groundwater recharge mechanism or groundwater table in watershed areas caused by development activities such as water intake in aquaculture farms.

Major Potential Impacts

Major potential impacts include:

Soil salinization; and

Adverse effects on existing groundwater usage.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Changes in water level due to water excessive intake of water in sites of resource enhancement and aquaculture farms.

Special Considerations for Environmental Assessment

Special considerations are required with regard to over-exploitation of groundwater in sites of resource enhancement and aquaculture farms.

Mitigative Measures

Mitigative measures include:

Adequate scaling of resource enhancement and aquaculture activities and establishment of management plans for intake water; and

Monitoring of environmental impacts.

Related Studies Required

Related studies required include:

Surveys and investigation of geology, soil, hydrology, and groundwater and its utilization, etc.

3) Sedimentation

Definition

This term is defined as settlement of transported sediment in rivers, estuaries, and reservoirs.

Major Potential Impacts

Major potential impacts include:

Serious disturbance of water usage; and

Destruction of habitats of important fauna and flora.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Top soil run-off attributable to the removal of plant cover; and

Soil erosion due to land development and construction.

Special Considerations for Environmental Assessment

Special considerations include:

Soil erosion and sedimentation due to land development and construction works; and

Careful review of development activities involving removal of vegetation cover which are implemented in surrounding areas of coral reefs and sea grass beds.

Mitigative Measures

Mitigative measures include:

Erosion control planning;

Countermeasures to prevent soil erosion;

Project modification;

Studies on construction methods and duration; and

Monitoring of environmental impacts, and restrictions on land use.

Related Studies Required

Related studies required include:

Surveys and investigation of vegetation, topography and geology, soil, land use, hydrology, and distribution of coral reef, sea grass beds areas, etc.

4) Changes in Water Hydrology due to Alterations in Coastal (or Lacustrine) Topography

Definition

This term is define as effects on flows along the sea and lakes resulting from changes in coastal (or lacustrine) landforms due to the construction of structures along shore areas.

Major Potential Impacts

Major potential impacts include:

Increase in water and bottom sediment;

Adverse effects on fishing, and resource enhancement and aquaculture activities;

Adverse effects on navigation;

Reduction of water exchange; and

Occurrence of dead water areas.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Changes of coastal or lacustrine topography due to land reclamation at sites of resource enhancement and aquaculture farms.

Special Considerations for Environmental Assessment

Attention must be given to changes of coastal flows due to alterations of coastal or lacustrine topography resulting from development activities such as land reclamation at shore sites.

Mitigative Measures

Mitigative measures include:

Predictions of flows and their effects;

Project modification; and

Monitoring of environmental impacts, and study on the execution of mitigative measures.

Related Studies Required

Related study required include:

Studies on flows, actual conditions of fishing and resource enhancement and aquaculture activities, water and bottom sediments, and ecosystems.

5)Changes in Waves due to Alterations in Coastal (or Lacustrine) Topography

Definition

This term is defined as the effects on waves along the sea and lakes in resulting from changes in coastal (or lacustrine) land-forms due to the construction of structures along shore areas.

Major Potential Impacts

Major potential impacts include:

Adverse effect on drift sands;

Adverse effects on fishing, and resource enhancement and aquaculture activities; and

Adverse effects on navigation.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Changes in coastal or lacustrine topography due to land reclamation at sites of resource enhancement and aquaculture farms.

Special Considerations for Environmental Assessment

Special attentions must be given to changes in waves that cause serious damage to aquaculture cages and possible deterioration of sandy beaches due to drift sands.

Mitigative Measures

Mitigative measures include:

Development planning with due consideration of waves;

Project modification; and

Monitoring of environmental impacts.

Related Studies Required

Related studies required include:

Studies on wind and waves.

6) Changes in the Drift sands due to alterations in Coastal (or Lacustrine) Topography

Definition

This term is defined as the effects on drift sands along seas and lakes in accordance with changes in coastal (or lacustrine) landforms due to the construction of structures along shore areas.

Major Potential Impacts

Major potential impacts include:

Adverse effects on fishing and aquaculture activities;

Erosion of sandy beaches;

Adverse effects on habitats of important sandy beach fauna and flora; and

Deterioration of aesthetic or recreational sites.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Alterations in coastal or lacustrine topography due to land reclamation at sites of resource enhancement and aquaculture farms.

Special Considerations for Environmental Assessment

Constructions such as land reclamation at sandy beach areas must be carefully reviewed.

Mitigative Measures

Mitigative measures include:

Development planning with due consideration of drift sands;

Project modification; and

Monitoring of environmental impacts.

Related Studies Required

Related studies required include:

Studies on drift sands, wind, and waves.

7) Impediments to Navigation

Definition

This term is defined as adverse impacts on waterway traffic by vessels and/or boats due to development activities.

Major Potential Impacts

Major potential adverse impacts include:

Hindrance of waterway traffic and waterborne delivery of commodities to the market.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Alterations in coastal topography due to land reclamation at sites of resource enhancement and aquaculture farms;

Installation of aquaculture facilities such as submerged cages; and

Changes of flows or waves.

Special Considerations for Environmental Assessment

Special considerations include:

Due consideration to waterway traffic in case of installation of structures and aquaculture cages.

Mitigative Measures

Mitigative measures include:

Development planning with due consideration to the aspirations and needs of user groups;

Project modification; and

Monitoring of environmental impacts.

Related Studies Required

Related studies required include:

Baseline data on utilization of the areas; and

Interview survey to elicit the aspirations and needs of user groups.

(2) Water Quality and Bottom Sediments

1) Water Contaminations

Definition

This term is defined as deterioration of water quality due to development activities.

Major Potential Impacts

Major potential impacts include:

Deterioration of habitats of aquatic fauna and flora;

Eutrophication of water;

Disturbance of fishing activities;

Outbreak of red tides;

Oxygen depletion at the bottom layer; and

Deterioration in quality of fishery products.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Changes of flows;

Discharge of waste water from related fishery facilities, from resource enhancement areas and aquaculture farms, and from construction sites;

Run-off of pharmaceuticals used for aquacultural purposes;

Increased use of aquaculture feed; and

Dredging operations.

Special Considerations for Environmental Assessment

Special considerations include:

Conditions of semi-closed water areas;

Outbreak of turbidity due to land reclamation and land preparation; and

Turbidity and spreading of waste materials in polluted bottom areas due to dredging operations.

Mitigative Measures

Mitigative measures include:

Studies on turbid water and waste water disposal;

Measurers to counter the spreading of water turbidity and waste matter;

Management plans for resource enhancement and aquaculture activities;
Defining of criteria for the discharge of waste water and strict supervisions; and
Monitoring of environmental impacts.

Related Studies Required

Related studies required include:

Studies on hydrology, water quality, bottom sediment, and actual condition of outbreak of red tides.

2) Contamination of Bottom Sediments

Definition

This term is defined as the deterioration of bottom sediments due to development activities.

Major Potential Impacts

Major potential impacts include:

Deterioration of habitats of aquatic fauna and flora;

Eutrophication of water;

Disturbance of fishing activities;

Oxygen depletion at the bottom layer; and

Build-up of residue of fishery pharmaceuticals in bottom sediments.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Changes in flows;

Discharge of waste water from related fishery facilities, from resource enhancement sites and aquaculture farms, and from construction sites;

Increased use of aquaculture feed; and

Dredging operations.

Special Considerations for Environmental Assessment

Attention must be given to semi-closed water areas, and increased turbidity and spreading of waste materials in polluted bottom areas due to dredging operations.

Mitigative Measures

Mitigative measures include:

Studies on turbid water and waste water disposal;

Measures to counter the spreading of turbidity and waste matter;

Management plans for resource enhancement and aquaculture;

Defining of criteria for the discharge of waste water and strict supervisions; and

Monitoring of environmental impacts.

Related Studies Required

Related studies required include:

Studies on hydrology, water quality, bottom sediment, etc.

3) Eutrophication of Water

Definition

This term is defined as the accumulation in water of nutritive soluble salts such as nitrates and phosphates due to development activities.

Major Potential Impacts

Major potential impacts include:

Deterioration of habitats of aquatic fauna and flora;

Disturbance of fishing activities;

Outbreak of red tides and toxic plankton;

Oxygen depletion at the bottom layer; and

Deterioration of aesthetic or recreational sites.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Discharge of waste water from related fishery facilities, and from sites of resource enhancement and aquaculture farms;

Increased use of aquaculture feed; and

Deterioration of water and bottom sediments.

Special Considerations for Environmental Assessment

Attention must be given to semi-closed water areas and aquaculture farms.

Mitigative Measures

Mitigative measures include:

Studies on waste disposal;

Management plans for resource enhancement and aquaculture;

Conservation of tidal flats;

Defining of criteria for the discharge of waste water and strict supervision; and

Monitoring of environmental impacts.

Related Studies Required

Related studies required include:

Studies on hydrology, water quality, bottom sediments, important fauna and flora, etc.

4) Changes in Water Temperature

Definition

This term is defined as adverse impacts on agriculture, fishery, and resource enhancement and aquaculture businesses due to changes in water temperature in rivers, lakes, sea areas, etc.

Major Potential Impacts

Major potential impacts include:

Changes in important aquatic flora and fauna; and

Deteriorations of fishing grounds due to water temperature extremes.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Inflow due to warm and cold water utilization.

Special Considerations for Environmental Assessment

Special considerations include:

Water supply and discharge in case of utilization of hot springs, groundwater, and deep layer water.

Mitigative Measures

Mitigative measures include:

Adjustment of temperature for water discharge; and

Monitoring of environmental impacts, and studies on how to execute mitigative measures.

Related Studies Required

Related studies required include:

Studies on water temperature.

(3)Atmospheric Issues

1) Offensive Odor Pollution

Definition

This term is defined as unpleasant odors due to offensive odor matter.

Major Potential Impacts

Major potential impacts include:

Frequent complaints of offensive odor from users of public facilities and communities; and

Degradation of fishery products as a result of adsorption of odors from waste oils and the like.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Operations of processing factories such as fish meal processing which cause odor outbreaks; and

Frequent utilization of port facilities causing outbreak of offensive odor due to water pollution.

Special Considerations for Environmental Assessment

Special considerations include:

Densely built-up areas, schools, or hospitals; and

High possibility of outbreak of offensive odor in dead water areas and sites of intensive fishing activities.

Mitigative Measures

Mitigative measures include:

Re-examination of planned components;

Due considerations to land use of the surroundings;

Installation of deodorization systems;

Adequate disposal of sludge from factories; and

Monitoring of environmental impacts, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required include:

Investigation of the number of previous offensive odor complaints; and

Atmospheric conditions such as wind direction and wind speed.

2) Noise and Vibration Pollution

Definition

This term is defined as increase in mechanical or other kinds of loud noise and vibration created by development activities.

Major Potential Impacts

Major potential impacts include:

Deterioration of the living environments; and

Harm to cultured fish and livestock.

Development Activities Generating Impacts

Development activities generating adverse impacts include:

Loud noise and vibration created by construction and operation of related fishery facilities.

Special Considerations for Environmental Assessment

The surrounding human habitation must be is carefully reviewed.

Mitigative Measures

Mitigative measures include:

Examination of locations of related fisheries facilities;

Studies on construction methods and period;

Project modification; and

Monitoring of environmental impact, and studies on the execution of mitigative measures.

Related Studies Required

Related studies required include:

Studies on the immediate environment of the factory and processing locations.

2.10 Environmentally-Sensitive Areas Requiring Special Attention

This section presents explanations on the significant natural and social environmental impacts which are to be carefully assessed in screening and scoping procedures set out under the Guidelines. The particular environments discussed include the following:

2.10.1 Natural Environments
(1) Tidal Flats
(2) Mangrove Forests
(3) Coral Reefs
(4) Sea Grass Beds
(5) Semi-Closed Water Areas
2.10.2 Social Environments
(1) Areas inhabited by Indigenous People, Ethnic Minorities, etc.
(2) Historic Remains, Cultural Assets and Aesthetic Sites
(3) Areas Likely to Suffer from Significant Adverse Socio-Economic Activities

2.10.1 Natural Environments

(1) Tidal Flats

Definition

Marshy grounds are defined as marshy areas which develop along lakes and swamps, or near the mouth of the rivers; tidal flats are seen in particular where shoaling beaches develop in the inner part of a bay where the range of tide is large. Tidal flats can be therefore interpreted as marshy grounds in a narrow sense. Tidal flats constitute unique ecosystems harboring the habitats of various species, and are the important areas which hold various functions as follows: ① spawning and nursery grounds for aquatic animals; ② water purification systems; ③ traditional fishing; ④ habitats of migratory birds; ⑤ recreational areas; and ⑥ buffers against natural disasters.

Various human activities and indudtries occurin tidal flats where land and water areas meet. Excess use or over-exploitation of such areas lead to loss of tidal flats. Destruction or degradation of such areas is deemed as one of the most serious global environmental issues of recent concern. Although the Ramsar Convention was established to conserve worldwide tidal

flats from further degradation, there are many areas which do not fall under the Ramsar Convention. In the future, it is necessary to conserve all of tidal flats areas, not just those specified areas under the Ramsar Convention.

Development Activities Having Significant Adverse Impacts

Development activities having significant adverse impacts on the sustainable utilization of tidal flats in fishery development are as follows:

① Development activities causing decrease of tidal flats due to land reclamation and land development;

② Development activities effecting changes in physical environment such as inflows and waves;

③ Development activities causing water pollution or introduction of exotic species which subsequently bring about adverse impacts on tidal flats ecosystems; and

④ Activities such as fish resource enhancement and aquaculture activities which migh improverish water resources in tidal flat areas.

Assessment of Environmental Impacts

When the existence of valuable tidal flats is identified in a project area and in the areas affected by the project, assessment of environmental impacts of fishery development activities should duly be considered as follows:

① Whether the subject tidal flats are listed in the Ramsar Convention;

② Whether the tidal flats in the project area are valuable or important regardless of designation in the Ramsar Convention;

③ The possibility and degree of change in the physical environment of the tidal flat such as in flows or waves;

④ The possibility and degree of environmental impact on ecosystem of tidal flats in project area due to water pollution or introduction of exotic species;

⑤ The possibility and degree of impacts on water resources;

⑥ The possibility and degree of adverse impacts on communities dependent on traditional artisanal fishing; and

⑦ The roles and function of the subject tidal flat in the prevention of disaster in adjacent inland dwelling areas.

Mitigative Measures

Adverse impacts on tidal flats should be minimized by modification of fishery development project at the planning stages. In face of unfavorable impacts, the following mitigative

measures should be implemented:

① Modification of a project or alteration of the site to minimize impact on decrease of the tidal flats;

② Modification of a project or alteration of the site to minimize impacts on changes in the physical environment such as inflows or waves in the tidal flats;

③ Mitigative measures to control water pollution;

④ Introduction of exotic species to minimize impacts on tidal flat ecosystems;

⑤ Planning in water intake to minimize impacts on water resources in the tidal flats;

⑥ Consideration of living conditions of inhabitants dependent on tidal flats;

⑦ Mitigative measures for the prevention of disaster in adjacent inland dwelling areas; and

⑧ Construction of artificial tidal flats to compensate for losses of tidal areas as a result of project implication.

(2) Mangrove Forests

Definition

Mangrove forests are general terms used for edaphic vegetation comprising evergreen shrubs and arbor forests growing naturally in shallow coastal areas, deltas, and brackish waters throughout the tropic and subtropics.

Compared with tropical rain forests, mangrove forests are monocultural in terms of variety of plant life components; however, they are important ecosystems, serving as spawning and nursery grounds for aquatic species, or natural habitats for wildlife. In addition, mangrove forests play an important role as areas of traditional fishing and providers of fuelwood for many human inhabitants residing around them. Recently, large-scale logging has been identified as among the most serious global environmental issues of recent concern. Therefore, it is important to consider the conservation of mangrove forests in the implementation of fishery development.

Development Activities Having Significant Adverse Impacts

Development activities having adverse impacts on sustainable utilization of mangrove forests by fishery development are as follows:

① Development activities causing decrease of tidal flats due to land reclamation and land development;

② Logging of mangrove forests;

③ Development activities effecting changes in the physical environment such as inflows and

waves; and

④ Development activities causing water pollution or introduction of exotic species which subsequently bring about adverse impacts on mangrove forest ecosystems.

Assessment of Environmental Impacts

When the existence of mangrove forests is identified in a project area or in the areas affected by the project, assessment of environmental impacts on fishery development activities should be considered as follows:

① Whether the subject mangrove forests are designated under legal processes;

② Whether the subject mangrove forests are important regardless of designation under legal processes;

③ The possibility and degree of changes in the physical environment such as inflows or waves in mangrove forest areas;

④ The possibility and degree of environmental impacts on the ecosystems in the subject mangrove forest such as due to water pollution or introduction of exotic species;

⑤ The possibility and degree of impact on communities dependent on traditional artisanal fishing in the subject mangrove forest; and

⑥ The potential role of the subject mangrove forest in the prevention of natural disaster in adjacent inland dwelling areas.

Mitigative Measures

Adverse impacts on mangrove forests should be minimized by modification of fishery development projects at the planning stages. In face of unfavorable impacts, the following mitigative measures should be implemented:

① Modification of a project or alteration of the site to minimize impacts on decrease of the mangrove forests;

② Modification of a project or alteration of the site to minimize logging in the mangrove forest;

③ Modification of a project or alteration of sites to minimize impacts on changes in physical environment such as in flows or waves in mangrove forests;

④ Mitigative measures for water pollution;

⑤ Introduction of exotic species to minimize impacts on ecosystems in mangrove forests;

⑥ Consideration of living conditions of human inhabitants dependent on mangrove forests;

⑦ Mitigative measures for the prevention of natural disaster in adjacent inland dwelling areas; and

⑧ Artificial propagation of mangrove forests to compensate for losses of mangrove forests as a result of project implementation.

(3) Coral Reefs

Definition

Coral reefs are solid limestone reefs formed by the consolidation of skeletons of hermatypic corals and other calcium carbonate-secreting animals. The limestone is formed from skeletons of hermatypic corals (nucleus), calcareous algae and other organic deposits (filling of pores), and melobesioid algae (adhesive). Hermatypic corals and other hermatypic organisms (coral reef community) are composed of substrate or dependency materials and serve as habitats of other organisms, and thus, the complex skeletons of these hermatypic organisms offer habitats to a variety of life forms. The coral reef community consists of a wide variety of organisms, and primary production in this community is higher than that in adjacent oceanic zones. In addition, the coral reef maintains stable ecosystem as a place of safety and protected habitat for small fish species exposed to predator species. Moreover, coral reef areas offer sites for various fishing activities and tourism.

Development Activities Having Significant Adverse Impacts

Development activities having significant adverse impacts on sustainable utilization of coral reef by fishery development are as follows:

① Development activities causing areal extinction of usable areas such as land reclamation and dredging;

② Development activities affecting changes in the physical environment such as in flows and waves;

③ Development activities inducing environmental impacts on coral reef ecosystems; and

④ Development activities generating turbidity.

Assessment of Environmental Impacts

When the existence of a valuable coral reef is identified in a project area and the areas affected by the project are defined, assessment of environmental impacts of fishery development activities should be considered as follows:

① Whether the coral reef is designated under the legal process;

② Whether the coral reef is important regardless of designation in the legal process;

③ The possibility and degree of changes in the physical environment such as inflows or waves in the coral reef area;

④ The possibility and degree of environmental impact on coral reef ecosystems due to water pollution or introduction of exotic species; and

⑤ The possibility and degree of impacts on communities dependent on traditional artisanal

fishing or tourism.

Mitigative Measures

Adverse impacts on coral reefs should be minimized by modification of a fishery development project at the planning stages. In face of unfavorable impacts, the following mitigative measures should be implemented:

① Modification of a project or alteration of the site to minimize impacts on areal extinction of coral reefs;

② Modification of a project or alteration of the site to minimize impacts on changes in the physical environment such as inflows, waves, or turbidity around the coral reef;

③ Mitigative measures for water pollution; and

④ Consideration for the living conditions of human inhabitants dependent on the coral reefs.

(4) Sea Grass Beds

Definition

Sea grass beds are defined as a dense community of large aquatic plants such as *Zostera* or *Sarugassum*, in shallow water areas.

Sea grass beds serve as habitats for a wide variety of organisms, thus, such a community maintains higher biological production than that in adjacent zones, and is an established unique ecosystem. Sea grass beds play important roles as: ① spawning and nursery grounds for aquatic animals; ② water purification systems; and ③ traditional fishing grounds.

Development Activities Having Significant Adverse Impacts

Development activities having significant adverse impacts on sustainable utilization of sea grass beds by fishery development are as follows:

① Development activities causing areal extinction of usable areas such as land due to reclamation and dredging;

② Development activities affecting changes in the physical environment such as inflows and waves;

③ Development activities inducing environmental impacts on ecosystem of sea grass beds due to water pollution;

④ Development activities generating turbidity; and

⑤ Installation of culture cages.

Assessment of Environmental Impacts

When the existence of valuable sea grass beds is identified in a project area and the areas affected by the project are defined, assessment of environmental impacts on fishery development activities should be considered as follows:

① Whether the sea grass beds are designated under the legal process;

② Whether the sea grass beds are important regardless of designation in the legal process;

③ The possibility and degree of changes in the physical environment such as inflows or waves in the sea grass bed area;

④ The possibility and degree of environmental impacts on ecosystems in sea grass beds such as due to water pollution or introduction of exotic species; and

⑤ The possibility and degree of impacts on communities dependent on traditional artisanal fishing.

Mitigative Measures

Adverse impacts on sea grass beds should be minimized by modification of a fishery development project at the planning stages. In face of unfavorable impacts, the following mitigative measures should be implemented:

① Modification of a project or alteration of the site to minimize impact on decrease of the sea grass beds;

② Modification of a project or alteration of the site to minimize impacts on changes in the physical environment such as inflows or waves in sea grass beds ares;

③ Mitigative measures for water pollution;

④ Mitigative measures for presenting the spreading of turbidity;

⑤ Improvement plans in consideration for the living conditions of human inhabitants dependent on the sea grass beds;

⑥ Artificial propagation of sea grass beds to compensate for losses in a project site; and

⑦ Installation plans for culture cages which avoid damage to sea grass beds.

(5) Semi-Closed Water Areas

Definition

Semi-closed water areas are defined as water areas with low rate of water exchange. In inland areas, these include lakes, marshes and reservoirs, and in sea areas, these include bays and lagoons.

Sea grass beds and tidal flats are often found in semi-closed water areas and stable as a result of calm water conditions; such favorable natural conditions tend to be rapidly utilized in development activities such as construction of fishing ports or aquaculture farms, and these activities hold significant adverse environmental impact.

By limiting water exchange from the open sea, and an excessive load of pollutants build-up and rapid eutrophication of water is induced, and leading to outbreak of red tides or occurrence of oxygen depletion. Consequently, these cause mass mortalities of aquatic animals.

Development Activities Having Significant Adverse Impacts

Fishery development activities having significant adverse impacts on sustainable utilization of semi-closed water areas are as follows:

① Development activities inducing acceleration of topographical closure such as land reclamation;
② Development activities affecting changes in the physical environment such as inflows;
③ Development activities leading excessive water pollution;
④ Development activities generating turbidity such as land reclamation and dredging construction; and
⑤ Installation of culture cages.

Assessment of Environmental Impacts

When the existence of semi-closed water areas is identified in a project area and the areas affected by the project are defined, assessment of environmental impacts on fishery development activities should be considered as follows:

① Degree of impacts on eutrophication of water;
② Confirmation of sea grass beds and tidal flats;
③ The possibility and degree of changes in the physical environment such as inflows or waves in sea grass beds area;
④ The possibility and degree of environmental impacts of water pollution; and
⑤ The possibility and degree of impact on communities dependent on traditional artisanal fishing in the semi-closed areas.

Mitigative Measures

Adverse impacts on semi-closed water areas should be minimized by modification of a fishery development project at the planning stages. In face of unfavorable impacts, the following

mitigative measures should be implemented:

① Modification of a project or alteration of the site to minimize impact on reconstruction of topographical features considered as semi-closed characteristics;

② Modification of a project or alteration of the site to minimize impacts on changes in the physical environment such as flows or waves in semi-closed water areas;

③ Mitigative measures for water pollution;

④ Mitigative measures for pollutant loading such as sewage disposal;

⑤ Mitigation measures for preventing the spreading of turbidity;

⑥ Improvement plans in consideration of the living conditions of human inhabitants dependent on the semi-closed water areas; and

⑦ Consideration of tidal flats, sea grass beds, etc.

2.10.2 Social Environments

(1) Areas Inhabited by Indigenous People, Ethnic Minorities, etc.

Definition

This term is defined as areas of and the surrounding where indigenous people or ethnic minorities live and fishery project are implemented. It is necessary to pay due attention to the potential impacts on their livelihood in such dwelling areas. Such groups often maintain their livelihood by means of small-scale fishing or hunting in ancestral water areas or lands; they thus establish economic, cultural, and social systems closely related to their land. There is a high possibility that such groups may be unable to keep pace with rapid socio-economic change following the destruction of their base of livelihood. They usually lack capability to adapt to such change and tend to be impoverished further. For example, the introduction of new effective fishing methods in the traditional fishing grounds may lead to rapid reduction of fishery resources, and make them lise resource base for livelihood. Therefore, it is essential to duly consider the social, cultural, and economic status of indigenous people, ethnic minorities, etc. and appropriately intergrate the results of socio-economic analysis into development plans.

Development Activities Having Significant Adverse Impacts

Fishery development activities having significant adverse impacts on the dwelling areas of indigenous people, ethnic minorities, etc. are as follows:

① Disturbance of vested rights of water and land utilized or occupied by these people;
② Reduction of resources in water and lands utilized or occupied by these people;
③ Degradation of the ecosystem;
④ Conflicts and economic competition with other dwellers;
⑤ Adverse impacts on traditional cultural and social customs;
⑥ Damage and destruction of valuable buildings and sites held by indigenous peoples or ethnic minorities; and
⑦ Infestation and spread of diseases.

Assessment of Environmental Impacts

When the existence of the dwelling areas of indigenous people, ethnic minorities, etc. is identified in a project area, assessment of environmental impacts of fishery development activities should be considered as follows:

① Confirmation of vested rights of water and land utilized or occupied by such groups;

② The possibility and degree of impacts on resources in water and lands utilized or occupied by such groups;
③ The possibility and degree of impact on particularly important ecosystems;
④ The possibility and degree of impact on conflicts and intensification of economic competition with other dwellers;
⑤ The possibility and degree of impact on traditional cultural and social customs;
⑥ Confirmation of valuable buildings and sites of indigenous peoples or ethnic minorities; and
⑦ The possibility and degree of impacts on infestation and spread of diseases.

Mitigation Measures

Adverse impacts on the dwelling areas of indigenous people and ethnic minorities should be carefully reviewed from the initial stage of a project. Modification of the project, and employment of mitigative measures including special provisions for affected people, and integration of supporting plans for the affected should be considered if any threat of adverse impacts is identified. Mitigative measures to be carefully studied and implemented as follows:

① Hearings and considerations of need and aspirations of related inhabitants including indigenous people, ethnic minorities and related communities;
② Protection and adjustment of vested rights of water and land utilized or occupied by such groups;
③ Conservation and management of resources in water and lands utilized or occupied by such groups;
④ Mitigative measures, monitoring and modification of the planning regarding particularly important ecosystems;
⑤ Interest adjustment and monitoring between indigenous peoples, ethnic minorities, and other dwellers;
⑥ Relocation and modification of project plans regarding valuable buildings and sites forindigenous peoples or ethnic minorities;
⑦ Management of health and sanitation;
⑧ Provisions to support the affected people such as sufficient compensation and social and economic support systems in resettled places in case of relocation of peoples; and
⑨ Strengthening of related agencies.

(2) Historic Remains, Cultural Assets and Aesthetic Sites

Definition

This is defined as areas boasting historic remains and structures of archaeological, historical, cultural or religious value, and sites of aesthetic importance.

These cultural assets should be preserved and maintained. A lack of consideration at the initial stage of a project not only cause the loss of valuable heritage, but also generate negative effects on the tourist industry in such areas. Additionally, the lack of such considerations in planning processes may result in unnecessary construction delays and cost increase.

Development Activities Having Significant Adverse Impacts

Fishery development activities having significant adverse impacts on the historic remains, cultural assets and aesthetic sites are as follows:

① Land reclamation, land construction, and dredging;

② Logging operations; and

③ Installation of facilities for resource enhancement and aquaculture, and construction of structures.

Assessment of Environmental Impacts

When historic remains, cultural assets and aesthetic sites are located in a project area, assessment of environmental impacts of fishery development activities should be considered as follows:

① Confirmation of historic remains, cultural assets and aesthetic sites;

② The possibility and degree of environmental impacts on historic remains, cultural assets and aesthetic sites; and

③ The possibility and degree of impacts on the tourist industry as related to historic remains, cultural assets and aesthetic sites.

Mitigation Measures

Adverse impacts on historic remains, cultural assets and aesthetic sites should be carefully reviewed from the initial stage of project planning. Modification of the project, and employment of mitigative measures should be considered if any threat of adverse impact is identified. Mitigative measures to be carefully studied are as follows:

① Design planning to avoid areas in which exist historic remains, cultural assets and aesthetic

features;

② Relocation of historical assets, etc.;

③ Harmony with aesthetic features at picturesque sites;

④ Establishment of protected areas and access control areas;

⑤ Execution of protective and impact mitigative works;

⑥ Monitoring of environmental impacts; and

⑦ Support of related agencies.

(3) Areas Likely to Suffer from Fishery Development

Definition

This term is defined as areas where economic activities may adversely be affected due to fishery development activities.

These economic activities include capture fishery, aquaculture, hunting, agriculture, tourism, recreation, and waterway traffic. Grasp of these economic activities and prudent analysis of effects on such actitivities are essential.

Development Activities Having Significant Adverse Impacts

Fishery development activities causing significant adverse impacts on existing economic activities are as follows:

① Land reclamation, land construction and dredging;

② Logging operations; and

③ Installation of facilities for resource enhancement and aquaculture, and construction of structures;

④ Introduction of new fishing techniques;

⑤ Introduction of new species for aquaculture and resource enhancement businesses; and

⑥ Intake from aquaculture and resource enhancement operations.

Assessment of Environmental Impacts

When the existence of economic activities is identified in a project area, assessment of environmental impacts of fishery development activities should be considered as follows:

① Conditions of existing economic activities;

② Existence of vested rights for fishing and water utilized or occupied;

③ The possibility and degree of impact on the existing economic activities; and

④ Establishment of a base for existing economic activities and support system for such economic activities.

Mitigation Measures

Adverse impacts on economic activities should be carefully reviewed from the initial stage of project planning. Modification of the project, and employment of mitigative measures should be considered if any adverse impact is identified. Mitigative measures to be carefully studied are as follows:

① Sufficient understanding and adjustment of existing economic activities;

② Adjustment of vested interests of fishing and water utilization rights;

③ Protection measures for the base of existing economic activities;

④ Economic or technical support systems for new settlers or newcomers from other jobs;

⑤ Mitigative measures of impact on the existing economic activity;

⑥ Execution of monitoring; and

⑦ Strengthening of related agencies.