



DOCUMENTS ON ENVIRONMENTAL (IEA,IEE)

June 2018

FOR CONSULTING SERVICES FOR FLOOD RISK MANAGEMENT AND ENGINEERING SERVICES

FLOOD MANAGEMENT IN SELECTED RIVER BASINS SECTOR PROJECT
ADB LOAN NO. 3440 - INO

CONTRACT NO : 50/KTR/PPK-Ad.Satker/XII/2017

DATED: December 15, 2017

DOCUMENT NO. : IKAJV-D-Env-001

CONSULTANTS

PT. INDRA KARYA (PERSERO)

CONSULTING ENGINEERS



Jl.Gandaria IV/18, Jakarta Selatan, Indonesia, Telp 021.2793 8287
email : indra.karya.adbcs01@gmail.com

IN JOINT VENTURE WITH :

SINOTECH ENGINEERING CONSULTANTS, LTD. (TAIWAN)



PT.KWARSA HEXAGON (INDONESIA)



PT.CIRIAJASA ENGINEERING CONSULTANS (INDONESIA)



PT.MULTIMERA HARAPAN (INDONESIA)





DOCUMENTS ON ENVIRONMENTAL (IEA, IEE)

June 2018

FOR CONSULTING SERVICES FOR FLOOD RISK MANAGEMENT AND ENGINEERING SERVICES

**FLOOD MANAGEMENT IN SELECTED RIVER BASINS SECTOR PROJECT
ADB LOAN NO. 3440 - INO**

CONTRACT NO : 50/KTR/PPK-Ad.Satker/XII/2017

DATED: December 15, 2017

DOCUMENT NO. : IKAJV-D-Env-001

Rev	Date	Description	Prepared by	Checked by	Approved by	Remarks

CONSULTANTS

PT. INDRA KARYA (PERSERO)

CONSULTING ENGINEERS



Jl.Gandaria IV/18, Jakarta Selatan, Indonesia, Telp 021.2793 8287
email : indra.karya.adbcs01@gmail.com

IN JOINT VENTURE WITH :

SINOTECH ENGINEERING CONSULTANTS, LTD. (TAIWAN)



PT.KWARSA HEXAGON (INDONESIA)



PT.CIRIAJASA ENGINEERING CONSULTANS (INDONESIA)



PT.MULTIMERA HARAPAN (INDONESIA)



TABLE OF CONTENT

Table of Content	i
Abbreviation	ii
I. Introduction	1
1.1 Background	1
1.2 Objectives	2
II. Amdal Document Review Ciujung Dike	3
2.1 General	3
2.2 Term of Reference	4
2.3 Environmental Impact Analysis (Analisa Dampak Lingkungan / ANDAL)	5
2.4 Environmental Management and Monitoring Plans (Rencana Pengelolaan Lingkungan – Rencana Pemantauan Lingkungan RKL - RPL)	7
III. Amdal Document Review Ambon Flood Control Wai Batu Merah ...	9
3.1 General	9
3.2 Term of Reference	10
3.3 Environmental Impact Analysis	10
3.4 Environmental Management and Monitoring Plans (RKL - RPL) ..	12
IV. Amdal Document Review Ambon Flood Control Wai Ruhu	13
4.1 General	13
4.2 Term of Reference	14
4.3 Environmental Impact Analysis	15
4.4 Environmental Management and Monitoring Plans (RKL - RPL) ...	16

Abbreviation

ADB	= Asian Development Bank
BAPPENAS	= National Development Planning Agency
BBWS 3 Cis	= Balai Besar Wilayah Sungai Cidanau - Ciujung – Cidurian
BWSM	= Balai Wilayah Sungai Maluku
CBFRM	= Community - Based Flood Risk Management
CPP	= Community Participation in Procurement
CQS	= Consultant Qualification Selection
DED	= Detailed Engineering Design
DGAIF	= Directorate General of Agricultural Infrastructure and Facility
DSORGA I	= Directorate of Synchronization of Regional Government Affairs I
DGWR	= Directorate General of Water Resources
DMF	= Design and Monitoring Framework
DPMU	= District Project Management Unit
DRC	= Directorate of River and Coast
DWRD	= Directorate of Water Resources Development
DWRI	= Directorate for Water Resources and Irrigation
EARF	= Environmental Assessment and Review Framework
EIA	= Environmental Impact Assessment
EMP	= Environmental Management Plan
FRM	= Flood Risk Management
FTP	= Full Technical Proposal
IOL	= Inventory of Losses
IEE	= Initial Environmental Examination
IPP	= Indigenous People Plan
LAR	= Land Acquisition and Resettlement
MOA	= Ministry of Agriculture
MOF	= Ministry of Finance
MOHA	= Ministry of Home Affairs
MPWH	= Ministry of Public Works and Housing
NCB	= National Competitive Bidding
NGO	= Non-Government Organization
O&M	= Operation and Maintenance

PAI	= Project Administration Instructions
PAM	= Project Administration Manual
PIU	= Project Implementation Unit
PPMU	= Provincial Project Management Unit
QBS	= Quality Based Selection
QCBS	= Quality and Cost Based Selection
RBT	= River Basin Territory or Wilayah Sungai
RBO	= River Basin Organization or Balai Besar Wilayah Sungai / Balai Wilayah Sungai
RRP	= Report, and Recommendation of The President to The Board
SBD	= Standard Bidding Document
SES	= Social and Economic Survey
SOE	= Statement of Expenditure
SPRSS	= Summary Property Reduction and Social Strategy
SPS	= Safeguard Policy Statement
STP	= Simplified Technical Proposal
TKPSDA	= Tim Koordinasi Pengolaan Sumber Daya Air (Basin Coordination Forum)
TOR	= Term of Reference

CHAPTER 1

INTRODUCTION

1.1 Background

A core priority subproject has been identified under sub-component 2 namely construction of ± 11 km of new dikes in Ciujung. Subsequently, other major structural flood control subprojects under this sector Project will be identified and fully investigated during implementation, following the procedures established in the Environmental Assessment and Review Framework that prepared by Project Preparation Technical Assistance (PPTA) team. The BBWS 3 Cis, in associates with the Directorate General of Water Resources (DGWR), MPWH have prepared a strategic plan and program for managing floods in the Ciujung River Basin, which has been subject to multiple damaging floods. The strategic plan identifies a comprehensive list of possible structural and non-structural interventions throughout the basin. With assistance from the Asian Development Bank (ADB), a structural core subproject is proposed for initial loan funding, i.e., new dike construction along ± 11 km of the river immediately downstream of the Pamarayan Weir in Serang Regency, complemented by spillways and a retention basin.

Based on ADB Safeguard Policy Statement (SPS 2009), all studies indicate that the core subproject of the Ciujung River Basin, Serang, Banten is Category B. In addition, follow up the categorization of the subproject as set out in the Environmental Assessment and Review Framework (EARF), the Initial Environmental Examination (IEE) has been prepared based on screening and analysis of all environmental parameters, field investigations, and stakeholder consultations to meet the requirements for environmental assessment process and documentation based on ADB SPS 2009. Furthermore, the IEE considers Indonesia National Regulations (especially Government Regulation No. 27/2012 on Environmental Permit and Decree of Minister of Environment No. 05/2012 on Screening Criteria (type/scale/magnitude of activities requiring AMDAL)).

According to Government of Indonesia Regulation, the dike construction of Ciujung core subproject is subject to at least an Environmental Management and Monitoring Measure (UKL/UPL) and possibly to the more stringent Environmental Impact Assessment (AMDAL) requirements. Therefore, based on Minister of Environment Decree No. 05/2012, the volume of soil required for the dike construction (± 2.5 million m³) has triggered the AMDAL requirement. The project proponent i.e. BBWS 3 Cis, has already prepared AMDAL which has been completed and approved on 29 October 2014.

1.2 Objectives

The objectives of review on the AMDAL document encompass :

1. To check the consistency of TOR with the Environmental Impact Analysis, including Environmental Management and Monitoring Plan.
2. To identify whether the AMDAL Document has complied with ADB's SPS 2009.
3. To identify additional requirements needs to comply ADB's SPS 2009 and Gol Regulations
4. To identify whether any additional issues should be considered or adjusted prior to construction work commencement.
5. Provide recommendation for preparing adjustment based on recent observation.

CHAPTER 2

AMDAL DOCUMENT REVIEW

CIJUNG DIKE

2.1 General

The safeguard requirements from ADB and the Government have been detailed agreed in the EARF (Environmental Assessment and Review Framework) that potential environmental adverse impacts have been screened for two major interventions under the subproject: (i) watershed management; and (ii) \pm 11.8 km dike construction and associated infrastructure on Cijung River. However, based on environmental safeguards, the Project is categorized as environment category B in accordance with ADB's SPS 2009; therefore, an Initial Environmental Examination (IEE) report including an Environmental Management and Environmental Monitoring Plan (EMP) was prepared for the Cijung core subproject. The IEE concluded that the proposed core subproject can be implemented in an environmentally acceptable manner with the corresponding Environmental Management Plans.

Environmental Impact Assessment (Analisa Mengenai Dampak Lingkungan or AMDAL for the Cijung core subproject has been approved in accordance with government regulations to supplement the IEE, and the Environmental Management and Monitoring Plan of the approved AMDAL is presented in the IEE. However, for future subprojects the AMDAL reports will be accepted by ADB as an IEE on the condition that the English version of the full AMDAL and/or UKL/UPL is reviewed and considered to be consistent with SPS 2009 requirements.

The review of AMDAL Document will be based on EARF that required for entire Project and has outlines environmental screening procedures, assessment methodologies, environmental management (mitigation, monitoring and documentation), climate change adaptation and reporting for the components of the Project; and specifies institutional structure and mechanism to carry out compliance with the Environmental Management Plans.

2.2 Term of Reference

According to the procedures for Environmental Assessment and Review Framework, the environmental assessment of subprojects must fulfill requirements of ADB's SPS 2009 and the government regulations. Refer to ADB screening, the Rapid Environmental Assessment (REA) checklists are used to identify impacts, assess their likely significance and examine how negative impacts may be mitigated. The REA checklist has been applied for the structural core subproject (i.e. Ciujung Dike Construction) and it is classified as Category B for environment.

According to Government of Indonesia's Regulation, a mandatory AMDAL is required for any business and/or activity of which boundary overlaps with a protected area and/or potential impacts of the business and/or activity are predicted to affect nearby protected areas. Furthermore, Government Regulation PP No. 27/2012 (Article 4) mentions that location of an activity should comply with spatial plan; in case of non-compliance, the AMDAL application will be rejected.

The AMDAL document of Ciujung Dike Construction will be reviewed firstly through the Term of Reference (*Kerangka Acuan*) which is part of Environmental Impact Assessment (*Analisa Mengenai Dampak Lingkungan/AMDAL*¹) that prepared prior to the Environmental Impact Analysis (*Analisa Dampak Lingkungan/ANDAL*), and Environmental Management and Monitoring Plans (*Rencana Pengelolaan Lingkungan – Rencana Pemantauan Lingkungan/RKL – RPL*).

Term of Reference is such a framework that encompasses of the purpose and objectives of the subproject, scoping of subproject activities such as boundary of study area, preliminary environmental condition, affected environmental components, how depth the subproject will impact to the environment through identification of potential impact, evaluation of those potential impacts and determined as important hypothetical impacts, as well as the methodology of study.

Refers to the Environmental Assessment Review and Framework, observed that the Term of Reference of ANDAL Ciujung Dike Construction was not presenting some

¹ AMDAL Document consists of three books i.e. *Kerangka Acuan* (TOR), *ANDAL* (Environmental Impact Analysis), and *RKL – RPL* (Environmental Management and Monitoring Plans).

important activities that stated in EARF such as assessment of Institutional Capacity to support Institutional Arrangement and Responsibility as well as Information Disclosure and Grievance Redress Mechanism. The lack of some activities in the Term of Reference will influence to the Environmental Impact Analysis (ANDAL), means the ANDAL may not describe the Institutional Capacity, Information Disclosure and Grievance Redress Mechanism.

2.3 Environmental Impact Analysis (Analisa Dampak Lingkungan/ANDAL)

The Environmental Assessment Review Framework stated that an AMDAL to be accepted as an EIA, it will examine the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental performance. EIA should always include an Environmental Management Plans (EMPs) setting out in detail how each mitigation measure will be provided and monitored. An EIA also requires more consultation, as stakeholders are involved at an early stage in deciding the scope of the EIA study, as well as determining its outcome and the nature of the mitigation at draft final report stage.

Based on description in the EARF, that during implementation the CPMU, with assistance from the National Environmental Safeguard Specialist of the Consultant Team, shall be responsible for the activities related to environmental safeguards: (i) screen all subprojects for categorization in accordance with ADB SPS 2009 and Government of Indonesia and submit to ADB for approval; (ii) contract an accredited agency to prepare UKL/UPL or AMDAL study (in Bahasa Indonesia and English) as required based on the categorization; (iii) ensure the UKL/UPL or AMDAL meet ADB SPS 2009 requirements as described in the EARF; (iv) ensure that the UKL/UPL or AMDAL has been approved by the respective environment agency; (v) consolidate semi-annual environmental monitoring reports; (vi) ensure timely disclosure of final AMDAL and updated EMP in locations and form accessible to the public; and (vii) address, record, and report on any grievances brought about through the Grievance Redress Mechanism in a timely manner.

Review result on the Environmental Impact Analysis (AMDAL), found that some activities have clearly implemented such as forecast of important impacts and holistic evaluation on the impacts that describes the subproject's potential negative and positive environmental impacts. Subsequently, recommendation of measures needed has described on the other document i.e. Environmental Management and Monitoring Plans (RKL – RPL). In addition, public consultation has been carried out during the initial phase of AMDAL i.e. when preparing Term of Reference as an early stage in deciding the scope of EIA study.

There is lack of important activities i.e. assessment of Institutional Capacity, Information Disclosure and Grievance Redress Mechanism; hence there no information regarding capacity of institutional in District, Province, and Central or CPMU itself that related to the monitoring and evaluation, including environmental management of the Project. This condition similar for Grievance Redress Mechanism, which not described in the AMDAL document. Furthermore, Information Disclosure has been implemented through public consultation and Focus Group Discussion on the initial phase and has been incorporated in the TOR document as well as in the IEE for the Ciujung core subproject.

The implication of Institutional Capacity assessment is to support Local Government both District and Province, including Central Project Management Unit to have better understanding whether their related institutions have sufficient capacity such as number of human resource, skill and experience to monitor and evaluate the Project. Meanwhile, Grievance Redress Mechanism need to be provided to assist affected person (AP) to raise his/her complaints/concerns. For instance, if lodged complaint is not acted on promptly, or if AP is not satisfied with the resolution undertaken, he/she can avail of the grievance redress mechanism (GRM) set forth. The Grievance Redress Mechanism usually only apply for social issues; however, it should be prepared as well for environmental issues that occur during construction such as noise, dust, and altered access.

2.4 Environmental Management and Monitoring Plans (Rencana Pengelolaan Lingkungan – Rencana Pemantauan Lingkungan/RKL – RPL)

The contents of Environmental Management Plan are recommendation of management measures needed as reference for Proponent that assisted by Contractor when they will implement Environmental Management during phase of pre-construction, construction, and operational. On the other hand, Environmental Monitoring Plan consist of monitoring measures that used as reference for related institution that act as Supervisor.

Document of Rencana Pengelolaan and Pemantauan Lingkungan presents some measures on the phase of Pre-Construction such as the implementing Contractor will conduct more detailed socialization on the planned activities, installation of bulletin boards at the construction location, provide an integrated information center on the construction site, develop GRM Unit (Grievance Redress Mechanism) to receive input and complaints from surrounding community, and coordination with relevant government agencies and the surrounding community. Those measures properly enough to be implemented on the phase of preconstruction, and hopefully can be implemented up to Construction Phase, especially the Grievance Redress Mechanism which needed up to end of construction.

The critical phase usually is Construction, therefore the Environmental Management Plan in this phase based on environmental and social impacts that managed. The positive impact consists of increasing employment opportunities, and the measures proposed are coordination with the local government regarding the recruitment of workers, stipulates in the contract that the contractor prioritizes receiving local labor, informing the public about job vacancies, allowing local residents to open businesses, allow local residents to supply logistics of construction needs (whenever possible), and wage payments in accordance with minimum wage in Serang Regency.

For traffic disruption, the environmental management measures i.e. installation of traffic signs at the embankment and access road, installation of signs and lights flashing at the construction location, coordination with related parties (Dinas Perhubungan, Dinas PU and Tata Air and Polantas) to ensure that trucks do not exceed road capacity, truckload limitations do not exceed the capacity and load of roads to be

traversed, arranging the mobilization schedule of materials and heavy equipment, and the implementing contractor shall ensure repair/maintenance of the road.

The change in flow patterns is one of the environmental impact that should be managed, some measures proposed are redirecting the flow of the river to continue the function and meet the residents need, install sluice at Cijung tributaries, build plaster at Cijung River, and pumping water from Cijung tributaries to Cijung River.

In the phase of Operation, the important is impact of community structures change; hence measures of environmental management plan has considered to conduct water management to maintain water quality in Cijung River, build a sediment trap at downstream of Pamarayan dam, coordination with related institutions in Serang Regency, as well as Padegelang and Lebak districts as upstream areas of Cijung River to maintain catchment area in their respective areas.

Generally, all measures that proposed for Environmental Management and Monitoring Plans have considerate environmental and social impacts that estimated occur in the Phase of Preconstruction, Construction and Operation. However, to make sure that Implementing Contractor comply with all the measures of mitigation that stipulate in the Environmental Management and Monitoring Plans, the Contractor on behalf of Proponent, based on the Environmental Permit, should prepare the Implementation Report of Environmental Management and Monitoring Plans.

CHAPTER 3

AMDAL DOCUMENT REVIEW

AMBON FLOOD CONTROL WAI BATU MERAH

3.1 General

BWS Maluku has very limited experience in implementing foreign funded projects. BWS staff are not familiar with, or have limited experience in environmental assessment and management, and to fill the gap they usually engage services of external consultants in project development and implementation supervision related to environmental management. Therefore, a certified agency has contracted to assist in the development of the AMDAL study for Wai Batu Merah and Wai Ruhu to meet the environmental safeguard requirements of both ADB and the Government.

Safeguard requirements from ADB and the Government of Indonesia have been detailed agreed in the Environmental Assessment and Review Framework (EARF) that potential environmental adverse impacts have been screened. In addition, the purpose of the EARF is to guide the BWS of Maluku, as implementing agencies for civil works, in identifying anticipated environmental impacts of the Project, developing and implementing mitigation measures for these impacts, and monitoring environmental impacts for timely interventions.

The AMDAL review will consider the EARF and the availability of documents. However, not all documents can be collected, though the Consultant has tried to coordinate with Environmental Agencies both in Ambon City and Maluku Province. The document that still missing are Term of Reference, Environmental Management and Monitoring Plan, and the Environmental Permit of the Project.

3.2 Term of Reference

Environmental Specialist, on behalf of Consultant Service-01 (CS – 01), has tried to collect all the AMDAL document of Wai Batu Merah, however not all document can be collected to date. There only ANDAL (Analisa Dampak Lingkungan / Environmental Impact Analysis) that have been found/received from Balai Wilayah Sungai Maluku (BWS – Maluku).

Review on the Term of Reference still cannot provide for the time being. The Consultant Service – 01 (CS – 01) still trying to find the missing documents by coordinating with Balai Wilayah Sungai Maluku and Maluku Environmental Agency. A formal letter from CPMU has provided to get formal information from the Environmental Agency regarding the rest AMDAL documents.

3.3 Environmental Impact Analysis

Refer to the ANDAL document Chapter 1, there is statement that Ambon Flood Control on Wai Batu Merah consist of two main activities i.e. restoration on the downstream and conservation on the upstream. The entire Flood Control of Wai Batu Merah will be implemented through some activities such as river groove and dike rehabilitation, including sediment dredging for about 2.5 km; riverbanks management, build some new check dam, and modification of existing check dam on each tributary on the upstream.

Chapter 1 still less of information on restoration activities, especially the magnitude and location of dike as well as the river groove that will be rehabilitated. In addition, map of dredging location has not shown, as well for riverbanks management. Furthermore, all figures provided for check dam's location still not clear due to nonstandard map; hence difficult to be seen where is the coordinate of each check dam proposed, which will impact to the field engineer or related engineer to visit.

Identification of potential impact that described on the Chapter 1 still general for all construction activities both restoration and conservation. Moreover, there is an additional activity of conservation that has not mentioned previously i.e. replanting. The process of potential impact identification is using impact interaction matrix and impact flow chart. Nevertheless, found that there is an inconsistency of potential

impact on the matrix with the flow chart, including detailed description and list of the potential impacts. The potential impact which inconsistent is “landscape changes” as an impact of construction activities. It only once occurs on the matrix and has never been found on the flow chart and the description of potential impacts. Based on the field visit during project preparation, recommended that the change of landscape should be considered as a crucial negative impact; especially on the phase of construction of check dam at the upstream.

Chapter 2 describes the Preliminary Environmental Setting (Rona Lingkungan Hidup Awal) that clearly enough to understand the preliminary environmental condition before construction, especially regarding topography condition that describe the different of upstream, transition, and downstream. Therefore, that information can be used as reference to predict the potential impact of the construction activities both restoration and conservation; unfortunately, the potential impact still general described (not based on the specific location/topography condition, especially for the construction of check dam and dike which may will be different on the potential impacts.

Forecast of important impacts on the Chapter 3 describes the impact analysis process that based on the impact’s magnitude as the calculation result of preliminary environmental setting, prediction of the environment without construction, and the important nature of impact. Forecast of important impacts mostly based on the generic impacts which may occur on the civil construction, hence there is no explanation and analysis regarding impact of check dam construction that located on different location and topography. Meanwhile, based on the field survey to some of check dam locations on Wai Batu Merah, the topography condition should be considered as part of important impacts.

The final of environmental impact analysis is holistically evaluation on the environmental impacts in the Chapter 4. This chapter comprises the evaluation of the hypothetical important and unimportant impacts (DPH) that occur in the same space and time. Subsequently, examination of all hypothetical important impacts is intended to determine the association and interaction of all hypothetical important impacts (DPHs) to determine the overall impact characteristics of the activity.

The proponent of Ambon Flood Control on Wai Batu Merah should implement the holistically evaluation result of all important impacts as an interrelated and influencing entity to know the balance of positive impact which is positive with the negative.

3.4 Environmental Management and Monitoring Plans (RKL – RPL)

For the time being, the review on Environmental Management and Monitoring Plans cannot provided due to document has not on hand (not yet found). Similar with the Term of Reference, the Consultant still trying to find through coordination and support letter from CPMU.

CHAPTER 4

AMDAL DOCUMENT REVIEW

AMBON FLOOD CONTROL WAI RUHU

4.1 General

BWS Maluku has very limited experience in implementing foreign funded projects. BWS staff are not familiar with, or have limited experience in environmental assessment and management, and to fill the gap they usually engage services of external consultants in project development and implementation supervision related to environmental management. Therefore, a certified agency has contracted to assist in the development of the AMDAL study for Wai Batu Merah and Wai Ruhu to meet the environmental safeguard requirements of both ADB and the Government.

Safeguard requirements from ADB and the Government of Indonesia have been detailed agreed in the Environmental Assessment and Review Framework (EARF) that potential environmental adverse impacts have been screened. In addition, the purpose of the EARF is to guide the BWS of Maluku, as implementing agencies for civil works, in identifying anticipated environmental impacts of the Project, developing and implementing mitigation measures for these impacts, and monitoring environmental impacts for timely interventions.

The review of AMDAL Document will be based on EARF that required for entire Project and has outlines environmental screening procedures, assessment methodologies, environmental management (mitigation, monitoring and documentation), climate change adaptation and reporting for the components of the Project; and specifies institutional structure and mechanism to carry out compliance with the Environmental Management Plans.

4.2 Term of Reference

Term of Reference is such a framework that encompasses of the purpose and objectives of the subproject, scoping of subproject activities such as boundary of study area, preliminary environmental condition, affected environmental components, how depth the subproject will impact to the environment through identification of potential impact, evaluation of those potential impacts and determined as important hypothetical impacts, as well as the methodology of study.

The Term of Reference of Ambon Flood Control Wai Ruhu has presented scope of subproject activities that consist of restoration process by rehabilitating river dike, sediment dredging ± 1.7 km, and riverbank management. Meanwhile, for conservation process i.e. build some small dams and check dams on the upstream, and revegetation/replanting. In addition, public consultation and socialization has done in this initial phase with the aim of knowing the aspirations and get inputs from the surrounding community about the development plan of Ambon Flood Control Wai Ruhu.

Based on the analysis of passing capacity of the river, seen that the existing condition of the river cannot accommodate the plan's flood; hence the dike height needs to be added to accommodate the discharge of plan's flood. Technical design of the dike rehabilitation and check dam has presented on the Kerangka Acuan, including the environmental components that will be impacted by the construction. Potential impact identification described on the Chapter 1 is still general for all construction activities both restoration and conservation, moreover there is duplication of potential impact identification and made it redundant on the Chapter 2.

The *Kerangka Acuan* has not presented some important activities that stated in EARF such as assessment of Institutional Capacity to support Institutional Arrangement and Responsibility as well as Information Disclosure and Grievance Redress Mechanism. The lack of some activities in the Term of Reference will influence to the Environmental Impact Analysis (ANDAL), means the ANDAL may not describe the Institutional Capacity, Information Disclosure and Grievance Redress Mechanism.

4.3 Environmental Impact Analysis

Ambon Flood Control Wai Ruhu consist of two main activities i.e. restoration on the downstream and conservation on the upstream. The Flood Control Wai Ruhu will be implemented through some activities such as river groove and dike rehabilitation, including sedimentation dredging for about 1.6 km, river bank management, build small check dam and check dam on each tributary on the upstream.

Information on restoration activities not described completely, especially regarding magnitude and location of the dike as well as the river groove that will be rehabilitated. In addition, there is no location map that shown the dredging area, as well river bank management. Drawing of check dam location still not clear and without standard of map that should be provided; hence the location and initial setting was difficult to be seen where is the coordinate of each check dam proposed, which will impact to the field engineer or related engineer to visit. The Identification of potential impact described on the Chapter 1, however still general for all construction activities both restoration and conservation.

Preliminary Environmental Setting (Rona Lingkungan Hidup Awal) has described clearly enough to understand the preliminary environmental condition before construction, especially regarding topography condition that describe the different of upstream, transition, and downstream. Unfortunately, the potential impact still general described (not based on the specific location/topography condition, especially for the construction of check dam and dike which may will be different on the potential impacts.

Chapter 3 describes the impact analysis process that based on the impact's magnitude as the calculation result of preliminary environmental setting, prediction of the environment without construction, and the important nature of impact. However, forecast of important impacts mostly based on the generic impacts which may occur on the civil construction, hence there is no explanation and analysis regarding impact of check dam construction that located on different location and topography.

Environmental impact analysis is holistically evaluation on the environmental impacts in the Chapter 4 that comprises the evaluation of the hypothetical important and

unimportant impacts (DPH) that occur in the same space and time. Subsequently, examination of all hypothetical important impacts is intended to determine the association and interaction of all hypothetical important impacts (DPHs) to determine the overall impact characteristics of the activity.

The proponent of Ambon Flood Control on Wai Ruhu should implement the holistically evaluation result of all important impacts as an interrelated and influencing entity to know the balance of positive impact which is positive with the negative. This will lead to the Environmental Management Plan that should be prepared and complied by the Contractor.

Refers to the Environmental Assessment and Review Framework, some missing information found and should be adjusted and complied during the implementation of Environmental Management Plan, both by the Proponent and the Contractor.

4.4 Environmental Management and Monitoring Plans (RKL – RPL)

In the RKL–RPL document, the information regarding Rencana Pengelolaan Lingkungan (Environmental Management Plan) described on the Chapter 2, and Rencana Pemantauan Lingkungan (Environmental Monitoring Plan) on the Chapter 3. Environmental Management and Monitoring Plans are presented in the matrix tables, with the impact mitigation's approach through technology, economic social, and institution.

The Environmental Management Plan on the Construction Phase need to be reviewed critically due to the construction phase is kind of most critical phase than Pre-Construction and Post Construction phases. For instance, the impact mitigation for domestic waste generation still need innovation such as applied of 4R (Reduce, Reuse, Recycle, and Replace); rather than only compile at TPS (temporary disposal) and eventually disposed to TPA (final disposal).

The environmental management measures for traffic disruption i.e. installation of traffic signs at the embankment and access road, installation of signs and lights flashing at the construction location, coordination with parties (Dinas Perhubungan, Dinas PU and Tata Air and Polantas) to ensure that trucks do not exceed road capacity,

truckload limitations do not exceed the capacity and load of roads to be traversed, arranging the mobilization schedule of materials and heavy equipment, and the implementing contractor shall ensure repair/maintenance of the road.

In the phase of Operation, the important is impact to the water biota; hence mitigation measures that should be considered is to conduct water management to maintain water quality in Wai Ruhu by building sediment trap at downstream of the dam, including coordination with related institutions in Ambon City as well as Maluku Province to maintain catchment area in their respective areas.

Generally, all measures that proposed for Environmental Management and Monitoring Plans have considerate environmental and social impacts that estimated occur in the Phase of Preconstruction, Construction and Operation. However, to make sure that Implementing Contractor comply with all the measures of mitigation that stipulate in the Environmental Management and Monitoring Plans, the Contractor on behalf of Proponent, based on the Environmental Permit, should prepare the Implementation Report of Environmental Management and Monitoring Plans.