

INITIAL ENVIRONMENTAL EXAMINATION

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Indonesia: Flood Management in North Java Project

Cisanggarung River Flood Risk Management Subproject

Prepared by the Ministry of Public Work and Housing for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 6 July 2023)

Currency unit	–	rupiah (Rp)
Rp1.00	=	\$0.000067
\$1.00	=	Rp15,015

ABBREVIATIONS

ADB	–	Asian Development Bank
AMDAL	–	<i>Analisis Mengenai Dampak Lingkungan Hidup</i> (environmental impact assessment process in Indonesia)
ANDALIN	–	Environmental Impacts Assessment on Traffic
BAPPENAS	–	<i>Badan Perencanaan Pembangunan Nasional</i> (Ministry of National Development Planning of the Republic of Indonesia)
BBWS	–	<i>Balai Besar Wilayah Sungai</i> (river basin organization of a larger watershed management body)
BPBD	–	<i>Badan Penanggulangan Bencana Daerah</i> (Regional Disaster Management Agency)
BWS	–	<i>Balai Wilayah Sungai</i> (river basin organization of smaller watershed management body)
JS	–	<i>Jratun Seluna</i>
COVID	–	Corona Virus Disease
CPMIU	–	Central Project Management Implementation Unit
DAS	–	<i>Daerah Aliran Sungai</i> (watershed)
DED	–	Detailed Engineering Design
DELH	–	<i>Dokumen Evaluasi Lingkungan Hidup</i>
DGWR	–	Directorate General of Water Resources (Ditjen <i>Sumber Daya Air - SDA</i>)
DLH/DLHK	–	<i>Dinas Lingkungan Hidup/ Dinas Lingkungan Hidup dan Kehutanan</i> (provincial and district environmental protection agencies)
DPLH	–	<i>Dokumen Pengelolaan Lingkungan Hidup</i>
EA	–	Executing Agency
EARF	–	Environmental Assessment and Review Framework
ECC	–	Environmental Complaint Committee
EHS	–	Environment, Health, and Safety
EIA	–	Environmental Impact Assessment
EMP	–	Environmental Management and Monitoring Plan
ESP	–	Engineering Services Project
EWSIP	–	Enhanced Water Security Investment Project
FMNJP	–	Flood Management in North Java Project
FRM	–	Flood Risk Management
GHG	–	Greenhouse Gas
GOI	–	Government of Indonesia
GRM	–	Grievance Redress Mechanism
IA	–	Implementing Agency
IBAT	–	Integrated Biodiversity Assessment Tool
IEE	–	Initial Environmental Examination
IFC	–	International Financing Corporation
IUCN	–	International Union for Conservation of Nature
KBA	–	Key Biodiversity Areas

LARP	– Land Acquisition and Resettlement Plan
MOEF	– Ministry of Environment and Forestry
MPWH	– Ministry of Public Work and Housing (PUPR)
NBS	– Natural-Based Solution
OHSP	– Occupational Health and Safety Plan
OSS	– Online Single Submission
PAM	– Project Administration Manual
PCO	– Public Complaints Officer
Permen LH/LHK	– MOE Regulation/ MOEF Regulation (after the merger of the Ministry of Environment and Ministry of Forestry)
PIPIB	– <i>Peta Indikatif Penundaan Pemberian Izin Baru</i> (Indicative Map for Moratorium of New Permit)
PIU	– Project Implementation Unit
PMC	– Project Management Consultant
PPC	– Project Preparation Consultant
PPE	– Personal Protective Equipment
PUPR	– <i>Pekerjaan Umum dan Perumahan Rakyat</i> (Ministry of Public Works and Housing)
REA	– Rapid Environmental Assessment
ROW	– Right of Ways
RPJMN	– <i>Rencana Pembangunan Jangka Menengah Nasional</i> (GOI National Medium-Term Development Plan)
SDA	– <i>Sumber Daya Air</i> (Directorate General of Water Resources, DGWR)
SPPL	– <i>Surat Pernyataan Pengelolaan Lingkungan Hidup</i>
SPS	– Safeguard Policy Statement
TCLP	– Toxicity Characteristic Leaching Procedure
TRTA	– Transaction Regional Technical Assistance
UKL-UPL	– <i>Upaya Pengelolaan Lingkungan Hidup dan Upaya Pemantauan Lingkungan Hidup</i> (equal to IEE)
UNFCCC	– United Nations Framework Convention on Climate Change

GLOSSARY

<i>desa</i>	– village (administrative division)
<i>Kabupaten</i>	– District or regency
<i>kecamatan</i>	– sub-district

NOTE

In this report, "\$" refers to United States dollars.

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EXECUTIVE SUMMARY

1. **Background.** The proposed Flood Management in North Java Project (FMNJP) will strengthen climate resilience of the people and the economy in the Cimanuk-Cisanggarung (CimanCis) and the Seluna river basins.¹ It will help in reducing the risk to people, agricultural crops, and assets from flooding, in the rapidly urbanizing and industrializing northern coast of Java Island.² The project will operationalize the flood risk management (FRM) approach by (i) establishing earth observation services (EOS) and flood forecasting early warning and flood evaluation systems (FFWFES) to enhance flood preparedness of communities; (ii) improving planning and land zoning to reduce exposure to floods; and (iii) increasing climate resilience of flood protection infrastructure and their operation and maintenance (O&M). The project is aligned with the following impact: climate resilience enhanced to support economic growth. It will have the following outcome: flood risk in North Java Coast reduced and will have two outputs: Output 1: Flood risk management operationalized; and (ii) Output 2: Climate resilient infrastructure and O&M enhanced.

2. The project will finance the construction of selected flood risk management (FRM) projects in the Seluna and Cimanuk-Cisanggarung river basins that have been designed under Loan 3455-INO: Accelerating Infrastructure Delivery through better Engineering Services Project (ESP).³

3. The Initial Environment Examination (IEE) provides necessary details to eliminate or reduce the environmental risks associated with the subprojects such as loss of biodiversity, long-term damage to ecosystems, pollution, climate change, damage to aquatic ecosystems, land degradation, improper use and disposal of chemicals, and depletion of non-renewable resources. Specific safeguards seek to preserve sensitive natural areas (e.g., wetlands and critical habitats), areas of importance to indigenous peoples, and historical or cultural sites. This IEE has been prepared based on the feasibility study, rapid environmental assessment (REA), Environmental Survey and Assessment, and public consultations with affected people, local communities, and local authorities. The objectives are to ensure the environmental soundness and sustainability of the project, and to support the integration of environmental considerations into the project decision-making process.

4. In particular the IEE will, (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (ii) provide a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (iii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iv) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (v) ensure that occupational health and safety recommendations are complied with.

5. **Screening and Categorization.** Screening and categorization for the Cisanggarung River System subproject (the subproject) have been based on ADB's Rapid Environmental Assessment (REA) Checklist for Ports and Harbor. The results of the assessment indicate that the subproject and its components are unlikely to cause significant adverse environmental impact. Thus, the

¹ The CimanCis river basin territory is in West Java province, where Cirebon City is located. The Seluna river basin territory is in Central Java province, adjacent to Semarang City.

² The North Java Coast is a strategic corridor with (i) a population of 63.2 million in 2020 - a third of the Java island population – which is projected to reach 97.2 million by 2045; and (ii) more than 20% of the national gross domestic product. National Statistic Agency 2010-2022. BAPPENAS. 2020. National Medium Development Plan 2020-2024.

³ Asian Development Bank (ADB). 2016. *Report and Recommendation of the President to the Board of Directors: Proposed Technical Assistance Loan to the Republic of Indonesia for the Accelerating Infrastructure Delivery through Better Engineering Services Project*. Manila. (Loan 3455-INO).

subproject is categorized as environmental category B as per ADB SPS, 2009 and this draft IEE has been prepared by ADB SPS requirements for environment category B projects.

6. **Environmental Management Plan (EMP).** The EMP forms part of this IEE. It will guide the environmentally sound construction of the subproject and ensure efficient lines of communication among the parties involved in the project. The EMP identifies three phases of development as (i) pre-construction phase; (ii) construction phase; and (iii) post-construction (operation phase).

7. The purpose of the EMP is to ensure that the activities are undertaken in a responsible non-detrimental manner with the objectives of (i) providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensuring that safety recommendations are complied with.

8. **Consultation, Disclosure, and Grievance Redress.** The public participation process included identifying interested and affected parties (stakeholders); informing and providing the stakeholders with sufficient background and technical information on the subproject; creating opportunities and mechanisms whereby they can participate and raise their viewpoints (issues, comments, and concerns); giving the stakeholders feedback on process findings and recommendations; and ensuring compliance to process requirements with regards to the environmental and related legislation.

9. The subproject's Grievance Redress Mechanism provides a platform for redressal of their grievances and describes the informal and formal channels, time frame, and mechanisms for resolving complaints about environmental performance.

10. **Monitoring and Reporting.** The RBO supported by consultants will undertake internal monitoring. The CPMU will prepare semi-annual safeguards monitoring reports.

11. **Recommendations and Conclusions.** The potential adverse impacts that are associated with design, construction, and operation can be mitigated to standard levels without difficulty through proper engineering design and incorporation or application of recommended mitigation measures and procedures.

12. The mitigation measures have been developed to reduce all negative impacts to acceptable levels. The public participation processes undertaken during project design ensured stakeholders are engaged during the preparation of the IEE. The planned information disclosure measures and process for carrying out consultation with affected people will facilitate their participation during project implementation.

13. Based on the findings of this IEE, the subproject's environmental category "B" is confirmed.

I. INTRODUCTION

A. Project Background

1. The proposed Flood Management in North Java Project (FMNJP) will strengthen climate resilience of the people and the economy in the Cimanuk-Cisanggarung (CimanCis) and the Seluna river basins.¹ It will help in reducing the risk to people, agricultural crops, and assets from flooding, in the rapidly urbanizing and industrializing northern coast of Java Island.² The project will operationalize the flood risk management (FRM) approach by (i) establishing earth observation services (EOS) and flood forecasting early warning and flood evaluation systems (FFWFES) to enhance flood preparedness of communities; (ii) improving planning and land zoning to reduce exposure to floods; and (iii) increasing climate resilience of flood protection infrastructure and their operation and maintenance (O&M). The project is aligned with the following impact: climate resilience enhanced to support economic growth. It will have the following outcome: flood risk in North Java Coast reduced and will have two outputs: Output 1: Flood risk management operationalized; and (ii) Output 2: Climate resilient infrastructure and O&M enhanced.

2. The Directorate General of Water Resources (DGWR) under the Ministry of Public Works and Housing (MPWH) will be the executing agency. River Basin Organizations (RBOs) will be implementing agencies to deliver civil works. DGWR will be responsible for overall coordination, policy directions and administration, including those related to environmental safeguards. The Central Project Management Unit (CPMU) will have a designated environmental safeguards expert. The RBO will appoint an environmental safeguards focal person to support activities for compliance with environmental safeguards. The detailed structure of institutional/implementation arrangements is documented in Section X.

3. The project will finance the construction of selected flood risk management (FRM) infrastructure subprojects in the Seluna and Cimanuk-Cisanggarung river basins that have been designed under Loan 3455-INO: Accelerating Infrastructure Delivery through better Engineering Services Project (ESP).³ The project will promote natural based solutions for river works where technically, socially, economically feasible.

4. The Cisanggarung River system Flood Risk Management (FRM) Subproject (the subproject) will normalize the river, upgrade the river banks, upgrade river channel to increase flow capacity, and integrate nature-based solutions in the context of enhanced FRM measures.

B. Extent and Scope of IEE

5. The Rapid Environmental Assessment (REA) for the subproject is in Appendix 1. The results of the screening show that the subproject and its components with mitigation measures are unlikely to cause significant adverse environmental impact. Thus, the Subprojects are

¹ The CimanCis river basin territory is in West Java province, where Cirebon City is located. The Seluna river basin territory is in Central Java province, adjacent to Semarang City.

² The North Java Coast is a strategic corridor with (i) a population of 63.2 million in 2020 - a third of the Java island population – which is projected to reach 97.2 million by 2045; and (ii) more than 20% of the national gross domestic product. National Statistic Agency 2010-2022. BAPPENAS. 2020. National Medium Development Plan 2020-2024.

³ Asian Development Bank (ADB). 2016. *Report and Recommendation of the President to the Board of Directors: Proposed Technical Assistance Loan to the Republic of Indonesia for the Accelerating Infrastructure Delivery through Better Engineering Services Project*. Manila. (Loan 3455-INO).

categorized as environmental category B as per ADB SPS, 2009. This draft IEE has been prepared in accordance with ADB SPS requirements for environment category B projects.

6. All works are subject to environmental assessment and approval as required under the ADB Safeguard Policy Statement and Indonesian law, as applicable.

C. Approach and Methodology

7. The IEE study was carried out using a reconnaissance survey (as per the findings documented in several appendices), review of previous studies, field visits, consultation with stakeholders and non-government organizations (NGOs), review of existing data, assessment to identify adverse impacts, and the preparation of EMP. Secondary data, available published literature, documents, and maps (e.g., topographic, geological maps, forest, satellite imagery, and Google image maps) related to the influence area were reviewed. The existing policies, legislation, guidelines, and manuals related to water resources and the environment in Indonesia and ADB's policies and guidelines were also reviewed. The project concept and other project documents were also considered when preparing this IEE. The IEE will be updated in case there is major changes.

D. IEE Contents

8. This IEE (i) provides information on the subproject and its environmental requirements; (ii) provides necessary baseline conditions of the physical, ecological, physical cultural, and socio-economic environments and/or resources in and surrounding of project's area of influence; (iii) identifies and assesses potential impacts arising from the implementation of the project on these environments and/or resources; (iv) recommends measures to avoid, mitigate, and compensate for the adverse impacts; (v) presents information on stakeholder consultations and participation during project preparation; (vi) recommends a mechanism to address grievances on the environmental performance of the project; and (vii) provides an EMP which includes an environmental monitoring plan, and the responsible entities for mitigation and monitoring.

9. In particular, the EMP will, (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (ii) provide a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (iii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iv) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (v) ensure that safety recommendations are complied with. The IEE will be made as a binding document for all contractors and a copy is required to be kept on-site as a reference.

II. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

10. All projects supported by ADB must comply with ADB's SPS (2009), which sets out the policy objectives, scope and triggers, and principles for environmental safeguard areas to be followed across all aspects of its operations. ADB adopts a set of specific safeguard requirements that borrowers/clients are required to meet in addressing environmental impacts and risks. Borrowers/clients must comply with these requirements during the project preparation and implementation phases. ADB's environmental safeguard requirements are defined in ADB's SPS, Appendix 1 (Safeguard Requirements 1: Environment. Pages 30-40).

11. All environmental safeguard principles and requirements of ADB's SPS are reflected in this IEE.

12. **International good practice.** ADB's SPS requires that during the design, construction, and operation of the project the borrower/client will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards including the IFC / World Bank Group's *Environment, Health, and Safety Guidelines* (EHS Guidelines)⁴, and ADB Environment Safeguards: A Good Practice Sourcebook (Draft Working Document)⁵. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When host country regulations differ from these levels and measures, the borrower/client will achieve whichever is more stringent.

13. **Screening and Categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project, the sensitivity, scale, nature, and magnitude of its potential impacts, and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impact are assigned to one of the following four categories:

- (i) **Category A.** Projects could have significant adverse environmental impacts. An environmental impact assessment (EIA) is required to address significant impacts.
- (ii) **Category B.** Projects could have some adverse environmental impacts, but of lesser degree or less significant than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- (iii) **Category C.** Projects are unlikely to have adverse environmental impacts. Neither EIA nor IEE is required, although environmental implications are reviewed.
- (iv) **Category FI.** Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all projects will result in insignificant impacts.

14. **Environmental Management Plan.** An environmental management plan (EMP) that addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.

15. **Public Disclosure.** ADB will post the following safeguard documents on its website so affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:

- (i) For environmental category A projects, EIA draft report at least 120 days before Board consideration;
- (ii) Final or updated EIA and/or IEE upon receipt; and
- (iii) Environmental Monitoring Reports submitted by Implementing/Executing Agencies during project implementation upon receipt

⁴ http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines.

⁵ <https://www.adb.org/documents/environment-safeguards-good-practice-sourcebook>.

B. Indonesia's Environmental Safeguard and Regulatory Framework

16. Indonesia laws and regulations generally cover all items of environmental safeguards and related sector regulations on Occupational Health and Safety (OHS), employment conditions/labor, hazardous waste management, biodiversity, and climate change. A more complete list of Indonesian environmental Laws, Presidential Decrees, Sector Regulations, and MPWH Decrees relevant to environmental safeguards are presented in Appendix 2.

1. Regulations on Environmental Assessment

17. Besides, ADB's SPS (2009), the subprojects shall also comply with the Government of Indonesia's environmental laws, standards, rules, and requirements which impose restrictions on activities to avoid, minimize, or mitigate likely impact on the environment. It is the responsibility of the executing and implementing agencies to ensure that all activities under the project are in accordance with the legal framework, both national and local regulations. Compliance is required in all stages of the subprojects' implementation, including design, construction, and operation and maintenance. The key laws and regulations that apply to this IEE include, but may not be limited to, those presented below.

18. **Law No 11/2020**⁶. As the promulgation of Law No. 11/2020 on Jobs Creation (Omnibus Law) and Law No 32 of 2009 on Protection and Management of Environment law has been diluted, several clauses of the environmental law have been changed, deleted, or new clauses inserted into Law No. 11/2020.

19. Article 22 of the Law states that any business and activity that has a significant impact on the environment shall have an environmental impact assessment (AMDAL), and article 34 specifies that any business and activity that has no significant impact shall meet the standard of UKL-UPL. While Article 35 mentions low-risk activities that do not require a UKL-UPL, shall prepare a statement of ability to undertake environmental management and monitoring, *Surat Pernyataan Pengelolaan Lingkungan* (SPPL). In case the project causes significant traffic impacts, the proponent shall prepare ANDALALIN (Environmental Impacts Assessment on Traffic).⁷

20. **Government Regulation No. 22/2021**⁸ on Implementation of Environmental Protection and Management and **Government Regulation No. 5/2021** on Risk-Based Commercial Business Permitting, it is stated that the construction of water resource infrastructure buildings is an activity with a high-medium risk level.

21. **Decree of Minister of Environment and Forestry No. 4/2021**. The Government's screening procedure is presented in the Minister of Environment Decree No. 4/2021 on List of Business Plans and/or Activities Requiring AMDAL, UKL-UPL, or SPPL (Attachment 1 of the Decree provides a list of business and/or activities that need environmental impact assessment). The screening considers potential significant impacts as well as the magnitude or size of business or activities. The decree mentions that the types of business and/or activities that are required to have an Environmental Impact Assessment (AMDAL) are determined based on: (i) potential significant impact, and (ii) uncertainty of technological capabilities available to overcome significant negative impacts that will arise. Flood control activities including the normalization of

⁶ As the approval of newly issued Omnibus Law, this law was diluted in the Omnibus Law with some changes, deletion and insertion of new clauses.

⁷ Stipulated further in regulations of minister of transport and local regulations (Ministerial Regulation No. 17/2021 on Traffic Impacts Assessment).

⁸ Closing Clause of Government Regulation No. 22/2021 withdrawn Government Regulation No. 27/2012.

rivers in large or medium cities with a certain amount of dredging and embankment requires AMDAL document.

22. Article 8 of Government Ordinance No. 22/2021 set criteria for the business and/or activities with a significant impact on the environment and requires AMDAL:

- (i) Changes in land and natural landscape;
- (ii) Exploitation of natural resources, both renewable and non-renewable resources;
- (iii) Process and activity which potentially cause pollution and/or environmental deterioration and wasting and depletion of natural resources and their utilization;
- (iv) Process and activity which results may affect the natural environment, built-up environment, and social-cultural environment;
- (v) Process and activity which results will affect the preservation of natural resource conservation area and/or protection of cultural heritage protection;
- (vi) Introduction of plants species, animals, and microorganisms;
- (vii) Preparation and use of biological and non-biological materials;
- (viii) High-risk activities and/or affect state defense; and/or
- (ix) Application of technology that potentially affects the environment.

23. All project or business proposals will undergo screening to classify whether a project proposal would require AMDAL, or UKL-UPL, or SPPL. Using criteria outlined in the regulation and recommendation of the respective environmental agency, the project will be screened as shown in Figure 1.

Table 1: AMDAL, UKL-UPL, SPPL Categorization Based on Project Scale

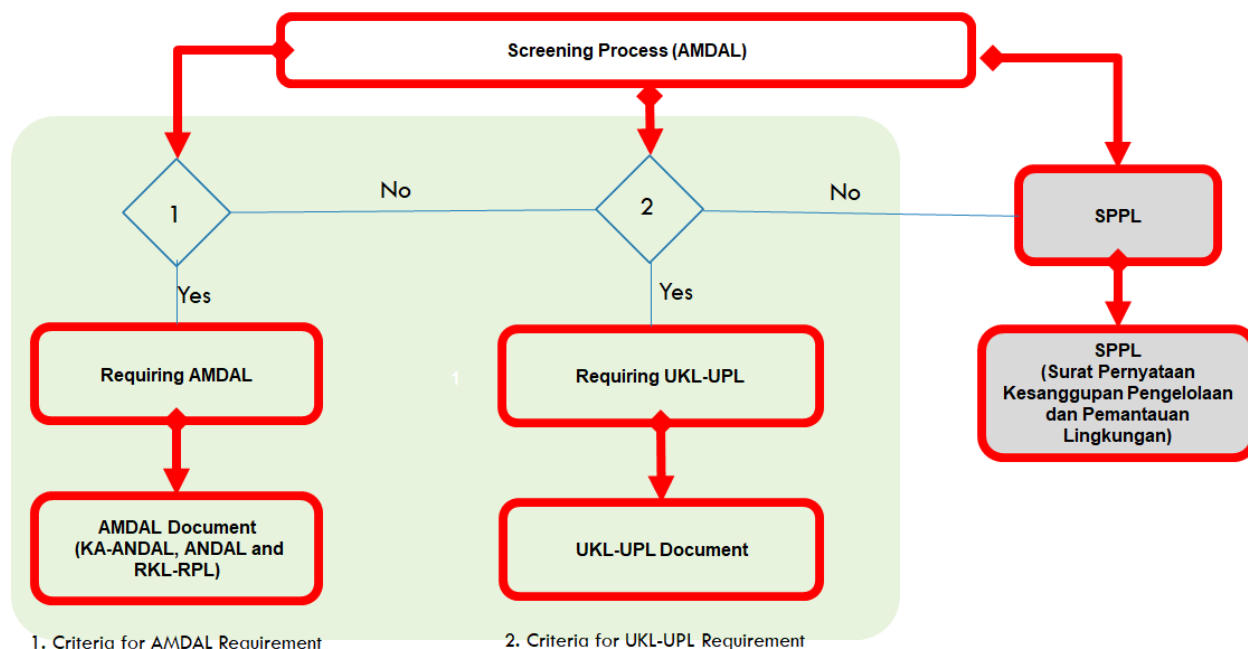
Project	Scale		
	AMDAL	UKL-UPL	SPPL
River Normalization			
Metropolitan City	River length ≥ 5 km; dredging volume ≥ 500.00 m ³	5 km > river length ≥ 1 km; 50.000 m ³ > dredging volume ≥ 50.00 m ³	River length <1 km; dredging volume <50.000 m ³
Large or medium city	River length ≥ 10 km; dredging volume ≥ 500.00 m ³	10 km > river length ≥ 1 km; 50.000 m ³ > dredging volume ≥ 50.00 m ³	River length <1 km; dredging volume <50.000 m ³
Small city or rural area	River length ≥ 15 km; dredging volume ≥ 500.00 m ³	15 km > river length ≥ 1 km; 50.000 m ³ > dredging volume ≥ 50.00 m ³	River length <1 km; dredging volume <50.000 m ³

Source: MoEF Regulation No. 4/2021.

24. The regulation of Minister of Environment and Forestry No. 4/2021 on List of Business and/or Activity Requiring AMDAL, UKL-UPL, or SPPL (Attachment 1) provides a list of business and/or activities that require environmental impact assessment, including public work (water resources and flood). All project or business proposals will undergo screening to classify whether a project proposal would require AMDAL, or UKL-UPL, or SPPL.⁹ The process is shown in Figure 1

⁹ The project screening procedure for both according to ADB SPS and Indonesia regulation is discussed and shown in EARF.

Figure 1: Environmental Screening and Environmental Documentation (Indonesian Regulation)



Source: Presentation of PDLUK (Ministry of Environment).

2. Regulations on Occupational Health and Safety

25. Relevant requirements concerning workers' health and safety include Law No.1/1970 on Workers' Safety and Decree of Minister of Workforce No. 5/2018 on Safety and Occupational Health.

26. Ministry of Public Work and Housing (MPWH) Instruction No. 02/IN/M/2020 on Coronavirus Disease 2019 (Covid-19) Prevention on Construction Work guides worker health and safety.

27. In addition to the requirements on worker safety through the national law on Labor, the Ministry of Public Work and Housing (MPWH) has issued its internal K3 (occupational health and safety) policy¹⁰ requiring MPWH projects and its workers to be provided with safe and healthy working conditions and measures to be defined and implemented to prevent accidents, injuries, and occupational disease. This decree applies to employees and laborers in all units of the ministry (including DGWR and RBO). Additionally, national laws on disaster management also provide for the protection of communities through disaster risk management measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.

3. Regulations on Labor and Employment

28. Law No. 11/2020 on Job Creation provides that every worker has equal right and opportunity to get appropriate employment and livelihood regardless of gender, ethnicity, race,

¹⁰ Regulation of Minister of Public Work and Housing No. 02/PRT/M/2018 on Revision of PUPR Regulation No. 05/PRT/M/2014 on Guidance of Occupational Health and Safety for Public Work Construction.

religion, and political orientation as their interest and competence, including equal treatment of disabled people.

29. Ministry of Workforce regulation derived from the law covers other items related to labor and employment, among others working hours, safety and occupational health, wage, layoff, compensation for work termination and leave, etc.

4. Regulations on Hazardous Wastes Management

30. The Indonesian legal framework on the environment requires cleaner production processes and good energy efficiency practices, avoidance of pollution, or, when avoidance is not possible, minimizing or controlling the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gas emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage.

31. This regulation (as stipulated in Government Regulation No. 22/2021) applies in the case of removal and transportation of hazardous sediments and other hazardous materials and wastes from river or flood works. The planned activities are not expected to produce significant amounts of Hazardous and Toxic Materials (B3) waste. Thus, there is no need to do a B3 waste test (Toxicity Characteristic Leaching Procedure or TCLP) as shown in Appendix 5.

32. The details of the hazardous wastes management described in MOEF Regulation No. 6/2021. The regulation set the procedure and requirement for (i) status of hazardous wastes, (ii) reduction of hazardous wastes, (iii) storage of hazardous wastes, (iv) collection of hazardous wastes, (v) transport of hazardous wastes, (vi) treatment of hazardous wastes, (vii) piling of hazardous wastes, (viii) dumping of hazardous wastes, (ix) trans-boundary transport of hazardous wastes, and (x) application and issuance of technical approval for hazardous waste management (PLB3) and operational feasibility certificate (SLO-PLB3).

5. Regulations on Protected Areas and Biodiversity

33. **MOEF Regulation No. 76/MenLHK-Setjen/2015 on Protected Forest Zoning.** This regulation sets forth the criteria for zoning of national park and management block of natural sanctuary, wildlife sanctuary, wilderness park, and natural tourism park. Management zones of national park consist of (i) core zone, (ii) wilderness zone, (iii) utilization zone, and/or (iv) other zones as applicable. The other zones consist of (i) marine protection zone; (ii) traditional zone; (iii) rehabilitation zone; and (iv) religious, cultural and historical zone, and/or special zone. The zones are set forth for each national park through a ministerial decree and supported with maps.

34. The regulation describes the criteria for each zone. Especially for core zone in national park, the following criteria apply:

- (i) Has ecosystem or represent original and natural ecosystem type or natural phenomenon and geological formation;
- (ii) Represent concentration of plant/biotic community and/or represent area with high biodiversity value;
- (iii) Represent mating and nesting area of target fauna/animal and/or breeding and growing area for the target fauna/animal; and/or
- (iv) Transit area for periodical migrant animals.

35. **MOEF Regulation No. 7/2021 on Forestry Planning, Change of Forest Areas Allocation and Function, and Use of Forest Area.** Under this regulation, use of forest area for other than

forestry activities are only allowed in production forest and protected areas with certain criteria, as follows:

- (i) Production Forest Conversion (HPK) function as set forth in laws and regulations;
- (ii) Not charged for Approval of Forest Area Use, Commercial Permit for Forest Use and/or other approval from Minister (MOEF), and not located in Forest Area set forth as Forest Area with Special Purpose (KHDTK) and Forest Area for Food Security (KHKP);
- (iii) Nonproductive, except at province which nonproductive HPK is not available; and
- (iv) Criteria for nonproductive forest is set forth based on dominance of non-forested land cover which is not greater 70% consisting among other shrubs, open space, and mixed farms.

36. The exception for the above criteria includes the following activities:

- (i) National Strategic Project;
- (ii) National economic recovery;
- (iii) Land acquisition for *Food Estate* and energy;
- (iv) Land acquisition for natural disaster;
- (v) Procurement of Agrarian Reform Land Object (TORA; *Tanah Objek Reforma Agraria*); and
- (vi) Commercial activities built and permitted in the forest areas before enactment of Law No. 11/2020 on Jobs Creation (Omnibus Law).

37. The development of reservoir and dam, agricultural cultivation, fishery, livestock, and plantation are some of activities other than forestry that are allowed in the forest area. The minimum distance of proposed facilities or building is also regulated under Government Regulation No. 16/2021, which requires that every building shall comply and acquire Approval of Building Permit (PBG). The permit granted to the proponent to develop new building, replace, expand, reduce, and/or maintain the building according to the technical standard.

38. MOEF Regulation No. P.106/MENLHK/SETJEN/KUM.1/12/2018 on Second Revision of MOEF Regulation No. P.20/MENLHK/SETJEN/KUM.1/6/2018 on Types of Protected Flora and Fauna. The regulation also refers to IUCN and other international conventions. Chapter III (Section III.B.1) and Appendix 7 presents the protected flora and fauna in the respective districts and province .

39. In addition to two regulations above, there are some other regulations related to biodiversity and protected areas, as follows:

- (i) Government Regulation No. 7/1999 on Preservation of Flora and Fauna Species;
- (ii) Government Regulation No. 8/1999 on Utilization of Flora and Fauna Species;
- (iii) Government Regulation No. 45/ 2004 on Forest Protection;
- (iv) Government Regulation No. 28/ 2011 on Management of Natural Sanctuary and Natural Conservation Areas and revised with Government Regulation No. 108/2015;
- (v) Government Regulation No. 71/2014 on Protection and Management of Peatland Ecosystem and revised with Government Regulation No. 57/2016;
- (vi) Government Regulation No. 32/1990 on Management of Protected Areas;
- (vii) MOE Regulation No. 29/2009 on Biodiversity Conservation at Local Level;
- (viii) MOE Regulation No. 03/2012 on Biodiversity Parks;

- (ix) MOEF Regulation No. P.94/MENLHK/SETJEN/KUM.1/12/2016 on Types of Invasive Species;
- (x) Regulation of DG Natural Resource Conservation and Ecosystem No. P.8/KSDAE/BPE2/ KSA.4/9/2016 on Guideline for Determining Wildlife Corridor as Essential Ecosystem; and
- (xi) Regulation of DG Natural Resource Conservation and Ecosystem No. P.5/KSDAE/SET/ KUM.1/9/2017 on Technical Guidance on Determination of High Biodiversity Areas Beyond Natural Sanctuary Area, Natural Preservation Area, and Hunting Park.

6. Indonesia Environmental Standards

40. Standards issued by the MOEF generally consist of environmental quality (ambient) standards applicable to the receiving environment and emission standards applicable to the pollution source. The standards for ambient air quality and noise are presented in Appendix 3, while water quality is presented in Appendix 4.

Table 2: Indonesia Environmental Standards

Aspect	Regulation
National Water Quality Standard	Government Regulation No. 22/2021 on Implementation of Environmental Protection and Management, Appendix VI on National Water Quality Standard
Ambient Air Quality Standard	Government Regulation No. 22/2021 on Implementation of Environmental Protection and Management, Appendix VII on Ambient Air Quality Standard
Noise Level Standard	State of Ministry of Environmental No. 48/1996 on Noise Level Standard
Vibration Level Standard	State of Ministry of Environmental No. 49/1996 on Vibration Level Standard

Source: Government Regulation No. 22/2021.

41. **Ambient Air Quality and Noise Standard.** Previous regulation on ambient air quality standards has been replaced with Government Regulation No. 22/2021. The former regulation still referred to the period when the sampling and measurement were carried out during the period. To compare with international standards, the latest regulation is compared with WB-IFC EHS Guidelines (2007), as presented in Table 3.

Table 3: Ambient Air Quality Standard and International Standards

No.	Parameters	Measurement Time	Air Quality Standard, $\mu\text{g}/\text{m}^3$	
			GR No. 22/2021	WB – IFC EHS Guidelines 2007
1.	Sulfur Dioxide (SO_2)	10-Minutes	-	500
		1 hour(s)	150	
		24 hour(s)	75	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
		1 year	45	
2.	Carbon Monoxide (CO)	1 hour(s)	10000	
		8 hour(s)	4000	

No.	Parameters	Measurement Time	Air Quality Standard, $\mu\text{g}/\text{m}^3$	
			GR No. 22/2021	WB – IFC EHS Guidelines 2007
3.	Nitrogen Dioxide (NO_2)	1 hour(s)	200	200
		24 hour(s)	65	
		1 hour(s)	50	
		1 year	50	40
4.	Photochemical Oxidant (O_2) as Ozone (O_3)	1 hour(s)	150	
		8 hour(s)	100	
		1 year	35	
5.	Non-Methane Hydrocarbon (NMHC)	3 hour(s)	160	
6.	Dust particulate < 100 μm (TSP)	24 hour(s)	230	
	Dust particulate < 10 μm (PM_{10})	24 hour(s)	75	150 (interim target 1) 100 (interim target 2) 75 (interim target 3)
		1 year	40	70 (interim target 1) 50 (interim target 2) 30 (interim target 3)
	Dust particulate < 2.5 μm ($\text{PM}_{2.5}$)	24 hour(s)	55	75 (interim target 1) 50 (interim target 2) 37.5 (interim target 3)
		1 year	15	35 (interim target 1) 25 (interim target 2) 15 (interim target 3)
	7.	Lead (Pb)	24 hour(s)	2

$\mu\text{g}/\text{m}^3$ = concentration in microgram per cubic meter, at normal atmosphere condition, namely pressure (P) 1 atm and temperature (T) 25°C

Notes:

1. Concentration which reported for measurement period for 1 (one) hour is concentration of measurement result which carried out for each 30 (thirty) minute (in 1 hour carried twice measurement) and carried between 11.00 – 14.00 local time.
2. Concentration which reported for measurement period for 8 (eight) hours is concentration from measurement time carried out between 06.00 – 18.00 local time.
3. Concentration which reported for measurement period for 3 (three) hours is concentration which carried out for measurement time for 3 (three) hours is concentration from measurement time which carried out between 06.00 – 10.00 local time.

Source: Government Regulation No. 22/2021 and WB – IFC EHS Guidelines 2007.

42. As shown in the above table, Indonesia air quality standard values are the same for one-hour measurement time of Nitrogen Dioxide (NO_2), but less strict than WB – IFC EHS for one-year measurement time. The thresholds value for sulfur dioxide and dust particulate is still in the range as targeted in WB – IFC EHS Guidelines (2007). The rest of the parameters (for example, lead, Non-Methane Hydrocarbon (NMHC) and Photochemical Oxidant (O_2) are regulated in the Government regulations, but not in WB – IFC EHS Guidelines (2007). Considering this, Indonesia standard for air quality standard prevails for the project.

43. Similar comparison also carried with Indonesia noise level standard (Regulation of Ministry of Environment No. 48/1999), as shown in Table 4. Indonesia noise standard values are same as WB – IFC EHS Guidelines 2007, except that Indonesia regulation does not differentiate noise level of daytime and nighttime and no measurement of background level of noise. Considering its comparability, Indonesia standard for noise level prevails for the project.

Table 4: Noise Level Standard and Its Comparison with International Standard

Receptor	Unit	National Noise Level Limits ^a	WB – IFC EHS Guidelines 2007	
			Daytime (7:00-22:00)	Nighttime (22: – 7)
Residential, educational, hospital, institutional, and religious	One hour Laeq (dBA)	55	55	45
Industrial and commercial		70	70	70
Office and trade		65	70	70
Green open space		50	Background level + 3dB at the nearest receptor location offsite	Background level + 3dB at the nearest receptor location offsite
Government and public space		60	Same as above	Same as above
Recreation		70	Same as above	Same as above
Cultural heritage		60	Same as above	Same as above

Source: Government Regulation No. 22/2021.

44. **Water Quality Standard.** Surface Water (Rivers and Lakes). Water quality standard surface water covers key parameters of physical, chemical, and biological aspects, including radioactivity as presented below. The parameters and threshold values for both surface water types (i.e., river and lake) is presented in Table 5.

45. Based on its utilization, there are 4 classes of surface water quality as mentioned in Appendix VI of GR No. 22/2021. For irrigation water it shall meet at least Class III (raw water provided for irrigation purpose). In case the water is also used as raw water for domestic use, it shall meet Class II requirement. The requirement for irrigation is less stringent than one for domestic use. The quality standard for Class III (for irrigation/agricultural purpose) is less stringent than one for domestic use (Class II).

Table 5: Quality Standard for Rivers, and Similar Water Bodies

Parameters (All Max limit in mg/L except noted otherwise.)	Class II (raw water for domestic use)		Class III (raw water for Irrigation use)	
	Lake	River	Lake	River
Temperature (°C)	Dev 3	Dev 3	Dev 3	Dev 3
Total Dissolved Solids (TDS)	1000	1000	1000	1000
Total Suspended Solids (TSS)	50	50	100	100
Transparency (Pt-Co)	4		2.5	
Color (Pt-Co)	50	50	100	100
Acidity Level (pH)	6-9	6-9	6-9	6-9
Biological Oxygen Demand (BOD)	3	3	6	6

Parameters (All Max limit in mg/L except noted otherwise.)	Class II (raw water for domestic use)		Class III (raw water for Irrigation use)	
	Lake	River	Lake	River
Chemical Oxygen Demand (COD)	25	25	40	40
Dissolved Oxygen (DO, >)	4	4	3	3
Sulfate (SO ₄ ²⁻)	300	300	300	300
Chloride (Cl ⁻¹)	300	300	300	300
Nitrate (as N)		10		20
Nitrite (as N)		0.06		0.06
Ammonia (as N)		0.2		0.5
Total Nitrogen	0.75	15	1.90	25
Total Phosphate (as P)	0.03	0.2	0.1	1.0
Fluoride (F ⁻)	1.5	1.5	1.5	1.5
Sulfur as H ₂ S	0.002	0.002	0.002	0.002
Cyanide (CN ⁻¹)	0.02	0.02	0.02	0.02
Free chlorine	0.03	0.03	0.03	0.03
Barium (Ba) dissolved	-	-	-	-
Boron (B) dissolved	1.0	1.0	1.0	1.0
Mercury (Hg) dissolved	0.002	0.002	0.002	0.002
Arsenic (As) dissolved	0.05	0.05	0.05	0.05
Selenium (Se) dissolved	0.05	0.05	0.05	0.05
Iron (Fe) dissolved	-	-	-	-
Cadmium (Cd) dissolved	0.01	0.01	0.01	0.01
Cobalt (Co) dissolved	0.2	0.2	0.2	0.2
Mangan (Mn) dissolved	0.4	-	0.5	-
Nickel (Ni) dissolved	0.05	0.05	0.05	0.05
Zinc (Zn) dissolved	0.05	0.05	0.05	0.05
Copper (Cu) dissolved	0.02	0.02	0.02	20
Lead (Pb) dissolved	0.03	0.03	0.03	0.06
Hexavalent Chromium (Cr-(VI))	0.05	0.05	0.05	0.5
Oil and Grease	1	1	1	1000
Total Detergent	0.2	0.2	0.2	1.0
Phenol	0.005	0.005	0.01	1.5
Aldrin/ Dieldrin	-	-	-	-
BHC	210	210	201	210
Chlordane	-	-	-	-

Parameters (All Max limit in mg/L except noted otherwise.)	Class II (raw water for domestic use)		Class III (raw water for Irrigation use)	
	Lake	River	Lake	River
DDT	2	-	2	-
Endrin	4	2	4	2
Heptachlor	-	4	-	4
Fecal Coliform (MPN/100 mL)	1000	1000	2,000	2,000
Total Coliform (MPN/100 mL)	5000	5000	10,000	10,000
Chlorophyll-a (mg/m ³)	50	-	100	
Solid waste	None	-	None	nil
Radioactivity				
Gross- A (Bq/L)	0.1	0.1	0.1	0.1
Gross- B (Bq/L)	1	1	1	1

Source: Appendix VI of Government Regulation No. 22/2021.

46. Rivers and lakes are similar as surface water, but some specific parameters are only required for lakes, among others: transparency, (dissolved) manganese, DDT, and Chlorophyll-a. In addition, threshold values for Total Nitrogen and Total Phosphate for lake are less than those of river, as shown in Table 6. Such standard for river and lake water apply to the project's requirements once the freshwater taken from one or both sources for irrigation or as raw water for domestic use in the farm site or its facilities, agro-processing facility, agribusiness terminal/sub terminal, or laboratory. Measurement for the water quality in this project only cover key parameters (excluding radioactivity and specific organic chemicals that are not relevant).

47. **Groundwater Standard.** Referring to Regulation of Minister of Health No. 32/2017, the groundwater standard for hygiene and sanitation use (including water supply for domestic use, i.e. equal to drinking water standard) comprising of three parameters, as shown in Table 6. Such standard for groundwater applies to the project's requirements once the freshwater abstracted as raw water for domestic use. According to the law, water especially groundwater is prioritized for basic human needs over other uses, even though groundwater is allowed for other uses such as irrigation, once basic community needs are met, as per regulation of Ministry of Public Works and Housing.

Table 6: Groundwater Standard for Hygiene-Sanitation Purpose

No	Parameters	Unit	Quality Standard (Minimum Value)
A.	Physical Parameters		
1.	Turbidity	NTU	25
2.	Color	TCU	50
3.	TSP (Total Dissolved Solid)	mg/l	1000
4.	Temperature	°C	air temperature ± 3
5.	Taste		No taste
6.	Smell		No smell
B	Biological Parameters		
1.	Total coliform	CFU/100ml	50
2.	E. coli	CFU/100ml	0
C	Chemical Parameters		

No	Parameters	Unit	Quality Standard (Minimum Value)
1.	pH	mg/l	6,5 – 8,5
2.	Iron	mg/l	1
3.	Fluoride	mg/l	1,5
4.	Hardness (CaCO ₃)	mg/l	500
5.	Manganese	mg/l	0,5
6.	Nitrate, as N	mg/l	10
7.	Nitrite, as N	mg/l	1
8.	Cyanide	mg/l	0,1
9.	Detergent	mg/l	0,05
10.	Total Pesticide	mg/l	0,1

Source: Regulation of Minister of Health No. 32/2017).

7. Local Regulations on Environmental Management

48. Relevant local regulations (both at the provincial and district level) related to environmental protection and management were also consulted, among others those related to environmental protection and management, mangrove protection and restoration, spatial plan, coastal areas and small islands spatial plan, coastal area zoning, etc. As applicable the necessary permits and related legislation at national and local level shall be complied with.

8. Indonesia Country Safeguard System

49. The Indonesia AMDAL system generally conforms to the intent of ADB's environmental policy principles, requirements, and management guidelines. According to the regulation, all projects should undergo environmental clearance before proceeding to implementation. shows the relationship between the ADB environmental categorization and those under Indonesia's regulations/policies. Essentially, an AMDAL study corresponds to an EIA, and a UKL-UPL corresponds to an IEE. The Statement of Environmental Management and Monitoring undertaking (*Surat Pernyataan Kesanggupan Pengelolaan dan Pemantauan Lingkungan Hidup – SPPL*) generally corresponds to the environmental implication review of Category C projects as per the ADB SPS 2009. Several studies have been carried out to study the alignment of the Indonesia safeguard system and ADB SPS.¹¹

- (i) **AMDAL** and EIA correspond to a certain extent, though the criteria used for categorization under the Government of Indonesia's AMDAL procedure and ADB SPS 2009 requirements differ. Indonesia regulation provides quite rigid quantitative criteria, while ADB rely on qualitative criteria (significance). For example, Indonesia's AMDAL procedure classifies projects based on specific magnitude (length, depth, width, size, or other physical dimensions), whereas ADB's SPS 2009 categorizes projects based on the "significance of impacts". Not all activities requiring AMDAL per Indonesia's AMDAL procedure may categorize as category A per ADB SPS 2009.
- (ii) **UKL-UPL** is required for certain business activities which unlikely to have significant impacts on the environment, but still require environmental assessment and approval. There is no specific certification for the team required for the preparation of a UKL-UPL.

¹¹ Aligning Asian Development Bank and Country Systems for Improved Project Performance (<https://www.adb.org/projects/documents/aligning-asian-development-bank-and-country-systems-improved-project-performance-tar>) and <https://www.adb.org/sites/default/files/project-document/185257/43220-014-pssa-01.pdf>.

- (iii) **SPPL** requires the proponent to monitor and manage the environmental impact of low-risk businesses and/or activities that are not required to prepare AMDAL or UKL-UPL.

Table 7: ADB and Indonesia Project Categorization Systems

ADB Project Categories	GOI Project Categories
Category A: A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.	AMDAL: Projects with significant impact that require an Environmental Impact Assessment (AMDAL) according to the law. The detailed criteria that trigger an AMDAL are defined in the Decree of Minister of Environment and Forestry No. 4/2021.
Category B: A proposed project is classified as category B if its potentially adverse environmental impacts are less adverse than those of Category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases, mitigation measures can be designed more readily than for Category A projects. An initial environmental examination is required.	UKL-UPL: Projects with no significant impact that according to the law requires Environmental Management and Environmental Monitoring Measures (UKL-UPL).
Category C: A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed	SPPL: Projects that do not require AMDAL or UKL-UPL are obliged to submit a 'statement on commitment for management and environmental monitoring' or SPPL.

Source: Compiled from ADB SPS and Indonesia Regulation on AMDAL.

C. International Environmental Agreements

50. Indonesia has ratified several international conventions, and some are relevant to the subproject. The list of international conventions ratified by the Government of Indonesia related to the environment includes, among others:

- (i) Convention on Biological Diversity, for parties to require the environmental assessment of their proposed projects that are likely to have significant adverse impacts on biological diversity with a view of avoiding or minimizing such impacts. Indonesia is obliged to respect and protect traditional knowledge related to sustainable utilization of biodiversity, including promoting fair benefit sharing of the use of traditional knowledge. Based on this convention, the Nagoya Protocol was established, which was also ratified by the Government of Indonesia;
- (ii) Convention on Wetlands of International Importance Especially as Waterfowl Habitat (1972). Indonesia follows an international agreement to control the continuous encroachment of wetlands in the present and future, to recognize the basic ecological functions of wetlands follows the economic, cultural, scientific, and recreation.
- (iii) Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter (1972). Indonesia follows an international agreement to control marine pollution due to the accumulation of waste and other materials and to encourage regional agreements to complement the Convention; the London Convention came into effect in 1996.
- (iv) Vienna Convention for the Protection of the Ozone Layer, in 1998, and subsequent protocol and amendments, for parties to take appropriate measures to protect human health and the environment against adverse impacts likely to arise from human activities that will/likely modify the ozone layer.
- (v) Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL). Indonesia has ratified the international

- agreement to conserve the marine environment/marine pollution by banning oil and other hazardous substances and disposal of hazardous substances to suppress levels that do inadvertently (e.g., due to accidents).
- (vi) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1989). Indonesia has ratified the international agreement to reduce cross-country movement of waste by the minimum limit of the Convention to create environmentally friendly waste management and efficiency; reduce the toxicity of waste generated and ensure that environmental management is the basis for resource development.
 - (vii) United Nations Framework Convention on Climate Change (1992). Indonesia has ratified the international agreement to achieve stabilization of greenhouse gas concentrations in the atmosphere as low as possible to prevent dangerous anthropogenic interference with the climate.
 - (viii) Kyoto Protocol to the United Nations Framework Convention on Climate Change. Indonesia has ratified the international agreement to reduce greenhouse gas emissions by promoting national programs in developed countries aimed at reducing greenhouse gas emissions and determining the percentage of reduction targets for developed countries.
 - (ix) Indonesia has ratified the Paris Agreement within the United Nations Framework Convention on Climate Change (UNFCCC) dealing with greenhouse gases emissions mitigation, adaptation, and finance in October 2016.
 - (x) Convention on Fishing and Conservation of Living Resources of the High Seas (Marine Life Conservation). Objectives: Solve the problem of preservation of biological resources in the high seas through international collaboration with the consideration that the use of modern technology for the exploitation of resources in excess will cause harm to these resources.

III. DESCRIPTION OF SUBPROJECTS

51. The Cisanggarung River is a cross-provincial proposed subproject between West Java and Central Java Provinces. The river passes through districts of Kuningan, Cirebon, and Brebes. The overflow in the Cisanggarung River was caused by the over capacity, which can not accommodate water discharge with rainfall of more than 300 mm. The slope of the river was relatively flat. Several river sections obstructed river flow and silting due to high sedimentation. The proposed sub-projects as follows:

- (i) Elevation of embankments and protection of riverbanks to increase the capacity of the river so that it can cope with water overflow;
- (ii) Normalization of the river by cleaning the silt so that the capacity of the river increases; and
- (iii) River embankment protection to increase the stability of protected river channels.

52. Proposed subproject components include raising embankments and protecting riverbanks, normalizing the river (dredging the riverbed and/or widening the river), and riverbank protection. More information on the project description provided in Appendix 6.

A. Subprojects Location

53. The subprojects components will be located at Kuningan and Cirebon of West Java Province districts and Brebes of Central Java Province. The location of each subproject is shown in Table 8.

Table 8: Location of Proposed SubProject Components

ID	Proposed Sub-Project	Location			
		Village	Sub-District	District	Province
CS-2	Raised banks at Benda Village	Benda	Luragung	Kuningan	West Java
		Gunungkarung	Luragung	Kuningan	West Java
		Datar	Cidahu	Kuningan	West Java
CS-4	Raised banks at Cisanggarung-Cijangkelok River	Ciledug Wetan	Ciledug	Cirebon	West Java
		Karangsambung	Losari	Brebes	Central Java
CS-5	a. Riverbank protection	Dukuhwidara	Pabedilan	Cirebon	West Java
		Kalibuntu	Pabedilan	Cirebon	West Java
		Kedungneng	Losari	Brebes	Central Java
		Pekauman	Losari	Brebes	Central Java
		Karang Tengah	Losari	Brebes	Central Java
	b. Normalization	Babakan	Losari	Brebes	Central Java
		Bojongsari	Losari	Brebes	Central Java
		Kalibuntu	Losari	Brebes	Central Java
		Karangsambung	Losari	Brebes	Central Java
		Limbangan	Losari	Brebes	Central Java
		Losari Kidul	Losari	Brebes	Central Java
		Losari Lor	Losari	Brebes	Central Java
		Pekauman	Losari	Brebes	Central Java
		Pengabeian	Losari	Brebes	Central Java
		Randusari	Losari	Brebes	Central Java
		Bojongnegara	Ciledug	Cirebon	West Java
		Ciledug Lor	Ciledug	Cirebon	West Java
		Ciledug Wetan	Ciledug	Cirebon	West Java
		Astanalanggar	Losari	Cirebon	West Java
		Barisan	Losari	Cirebon	West Java
		Kalirahayu	Losari	Cirebon	West Java
		Losari Kidul	Losari	Cirebon	West Java
		Losari Lor	Losari	Cirebon	West Java
		Mulyasari	Losari	Cirebon	West Java
		Tawang Sari	Losari	Cirebon	West Java
		Babakan Losari	Pabedilan	Cirebon	West Java
		Babakan Losari Lor	Pabedilan	Cirebon	West Java
		Dukuh Widara	Pabedilan	Cirebon	West Java
		Kalimukti	Pabedilan	Cirebon	West Java
		Pasuruan	Pabedilan	Cirebon	West Java
Sidaresmi	Pabedilan	Cirebon	West Java		
CS-7	River Bank Protection at Andamui Village	Andamui	Ciwaru	Kuningan	West Java
CS-9	Riverbank Protection at Cibingbin Village	Cibingbin	Cibingbin	Kuningan	West Java

Source: Detailed Engineering Design, 2022.

54. The subproject will also elevate river embankment to increase its capacity and overcome the overflow. The elevation carried out by excavation and embankment plus protection of the embankment with the construction of revetments and gabions.

55. The subproject is divided into several locations, namely:

- (i) Raising and constructing river embankments (CS-2) is carried out starting from STA 20+200 to STA 20+900 or ±0.6 km long located in Benda Village, Gunung Karung Village, Luragung Sub-District, Kuningan and Datar Village, Cidahu Sub-District, Kuningan.

- (ii) Embankment elevation and riverbank protection (CS-5) which was carried out from 52+200 to 59+500 or ± 4.2 km long, located as shown in Table 9.

Table 9: Location of Riverbank Elevation and Protection Proposed subproject (CS-5a)

No	Proposed subproject Location	STA	Description
1.	Kalibuntu Village	STA 52+400 – STA 53+100	$\pm 0,7$ km
2.	Karang Tengah Village	STA 54+600 – STA 55+300	$\pm 0,7$ km
3.	Dukuh Widara Village	STA 55+350 – STA 55+900	$\pm 0,55$ km
4.	Kedungneng Village	STA 55+950 – STA 56+650	$\pm 0,7$ km
5.	Randusari – Pekauman Village	STA 57+900 – STA 59+500	$\pm 1,6$ km

Source: TRTA Consultants.

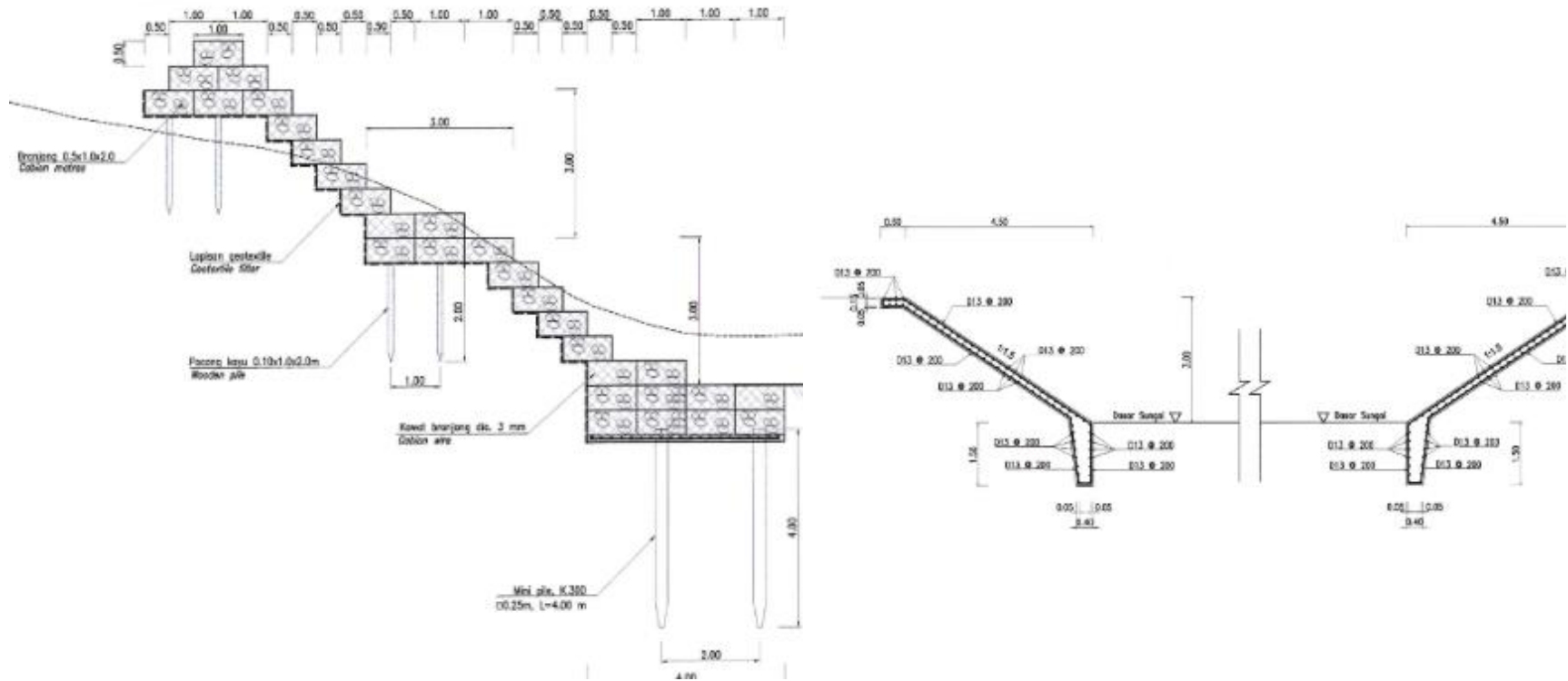
Table 10: Volume of Proposed Sub-projects

No.	ID	Proposed Sub-Project	Description
1	CS-2	Raising and Making River Embankments	Length: 2 x 700 m Width: 5 m Height: 7 -7,5 m
2	CS-5a	Embankment Raising and River Bank Protection	Length: 4,2 km Width: 3 – 11,6 m Height: 7 m

Source: Detailed Engineering Design, 2022.

56. The typical design for riverbank protection is presented in the figure below.

Figure 2: Typical of Embankment Raising and Riverbank Protection



Source: Detailed Engineering Design, 2022.

57. River normalization includes cleaning the river from silt/sediment and deepening to increase its capacity. River normalization is to increase the river's flowing capacity. This is intended to accommodate the flood discharge that occurs to be further channeled into a larger river or directly to the estuary/sea.¹⁵

Table 11: Work Volume of Proposed River Normalization and Dredging

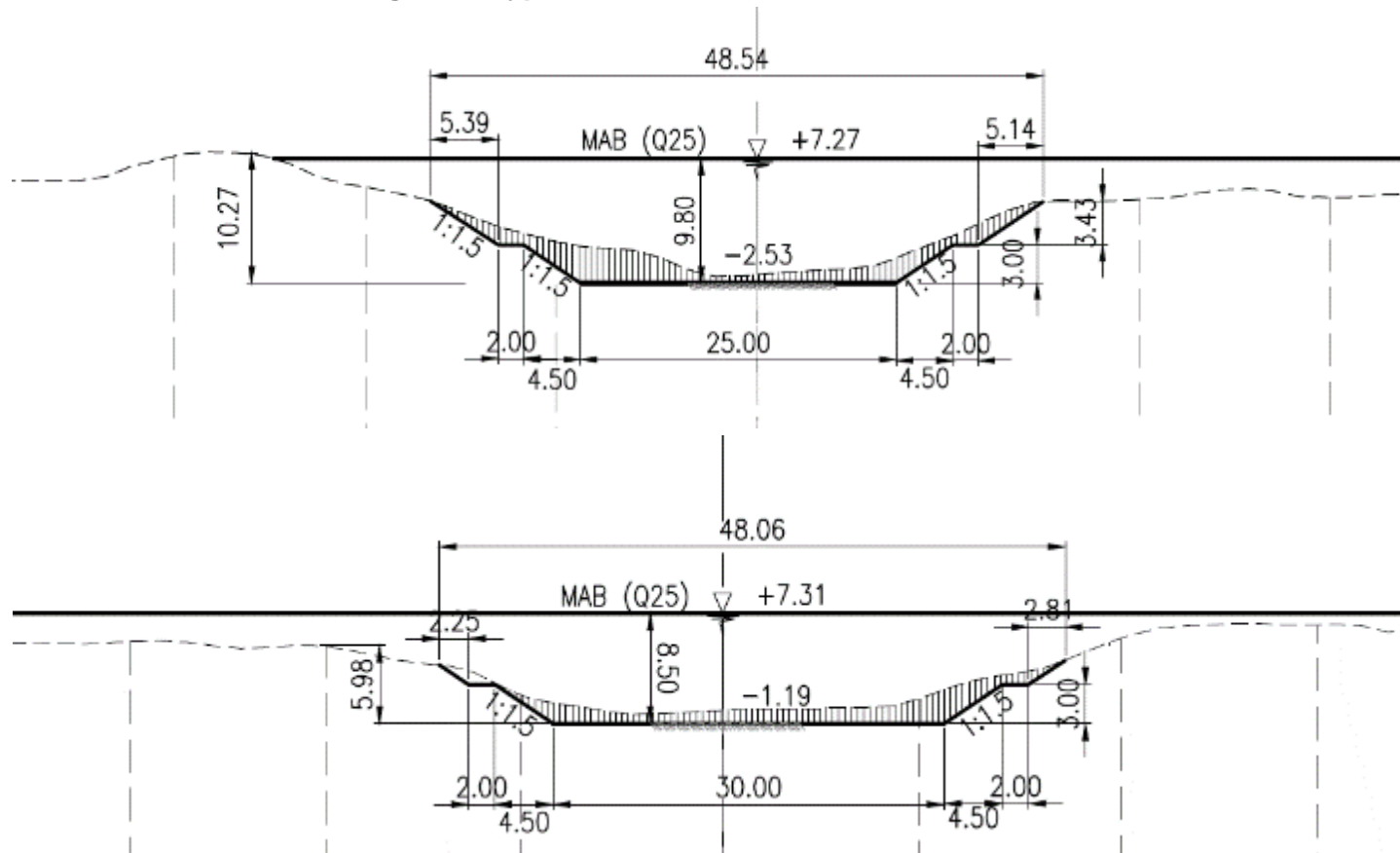
No.	Proposed Sub-Project	Description
1	Cisanggarung River Normalization (CS-5b)	Length: 23 km Excavation volume: 209.275 m ³

Source: Detailed Engineering Design, 2022

58. The typical design for river normalization is presented in Figure 3 below.

¹⁵ Tintia, Linda. 2018. Perencanaan Sistem Normalisasi Sungai Bubode Di Kecamatan Tomilito Kabupaten Gorontalo Utara. Jurnal Peradaban Sains, Rekayasa dan Teknologi. Vol. 6, No. 1.

Figure 3: Typical River Normalization Cross Section



Source: Detailed Engineering Design, 2022.

59. Reinforcement to protect riverbank or the surface of embankment slopes against erosion and wave runoff to increase the stability of the river channel or the protected embankment.¹⁶

60. The embankment is raised to accommodate the load of river water volume. There are various methods for the rising, namely by improving the cross-section, planning the embankment, expanding the existing embankment, and planning to strengthen slopes or cliffs prone to landslides.

Table 12: Work Volume of Raised Bank and Riverbank Protection

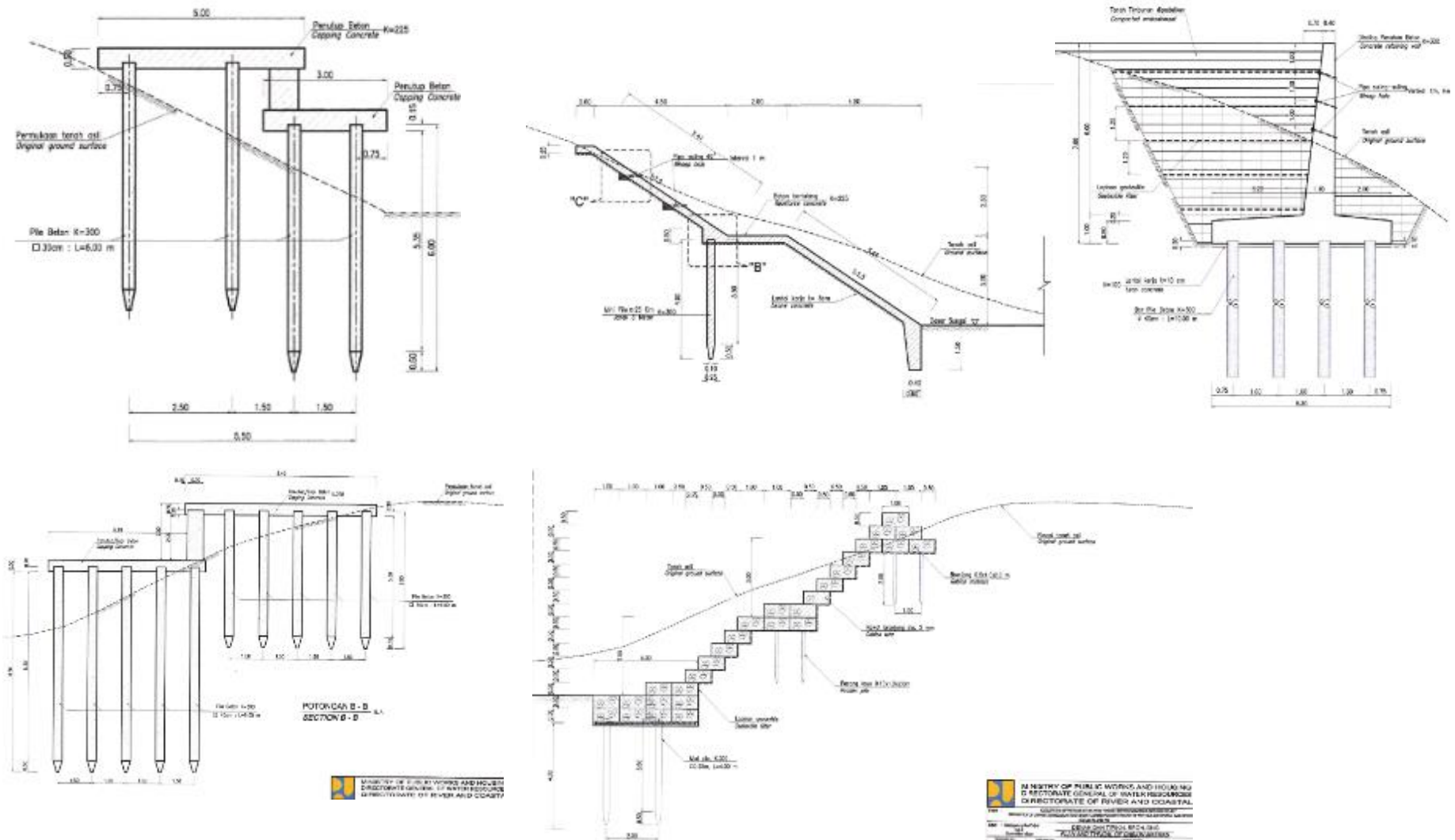
No.	Name of Activities	Scale
1	Raised banks at Cisanggarung-Cijangkelok River (CS-4)	Length: 2 x 1.500 m Width: 5 – 10 m High: 5 m
2	River Bank Protection at Andamui Village (CS-7)	Length: 800 m Width: 6 – 13 m High: 6-7 m
3	Riverbank Protection at Cibingbin Village (CS-9)	Length: 700 m Width: 5,4 m High: 5 m

Source: Detailed Engineering Design, 2022.

61. The typical design of Raised Riverbank and Protection is presented in the figure below.

¹⁶ Mukhriansyah. 2018. Analisa Stabilitas Perkuatan Tebing Sungai pada Hulu Sungai Amandit. Buletin Profesi Insinyur 1(2). Hal 67-69.

Figure 4: Typical Riverbank Protection



Source: Detailed Engineering Design, 2022.

IV. DESCRIPTION OF ENVIRONMENT (BASELINE DATA)

A. Physical Resources

1. Climate

62. BMKG in 2020 recorded the maximum average monthly rainfall in Kuningan of 498.5 mm. The highest rainfall in Kuningan recorded in February at 590.8 mm with 26 rainy days. While in Brebes, the highest rainfall recorded in January at 1291 mm with 15 rainy days.

63. The temperatures of Kuningan is ranging from 18°C to 32°C with rainfall ranging from 3,000-4,000 mm/year for the western part and especially on the slopes of Mount Ciremai, while other areas in the north and east the rainfall ranges from 2,000-3,000 mm/year.

64. The climatic conditions in Cirebon have an average rainfall of 1,500 – 4,000 mm per year. The highest temperature reaches 33°C, and the lowest temperature is around 24°C, with an average temperature of 28°C.

65. Cirebon and Kuningan are often hit by ‘angin kumbang’ or beetle winds that usually occur in July to early October. This beetle wind comes from Mount Ciremai. The event was marked by an increase in air temperature of 2-5 degrees Celsius per hour from the morning to noon. The appearance of beetle winds is also characterized by a decrease in air humidity between 5 to 34 percent per hour in the morning to noon. A beetle wind is a wind that blows down a mountainside towards a lower plateau with a high air temperature, with a low level of air humidity. The impact of beetle wind is that there is an increase in air temperature to reach 38 degrees Celsius. There is also a decrease in air humidity up to about 20 percent, as well as an increase in wind speed.

66. Brebes has a significant rainfall in most months and a short dry season. The average annual temperature in Brebes is 27.5°C, with an average precipitation of 1,961 mm/year. These climatic conditions support agricultural activities in Brebes. The air temperature in Brebes ranges from 25°C – to 33°C, with air humidity ranging from 60% - to 95%.

2. Geology

67. The Cisanggarung River is geologically divided into several formations. The stratigraphy of the Cisanggarung area from young to old with rock characteristics, namely rocks of Holocene, Pleistocene, Pliocene, Miocene, and Eocene ages. Meanwhile, the soil conditions in the Cisanggarung River are strongly influenced by the physiographic and geological conditions of the local area.

68. The Cisanggarung River area has soil conditions divided into 7 (seven) soil units, namely: (i) lithosol soil which occupies the steep slope of Mount Ciremai with Mediterranean brown Quaternary volcanic rocks; (ii) Regosols, which occupy almost all research areas from mountains to coastal plains, have low soil type organic matter content with high erosion sensitivity; (iii) Latosol, located in the slope area with moderate to low slope of the Ciremai volcano. Rocks in the form of volcanic products such as lava, breccia, tuffaceous sandstone; (iv) Andosols, rocks in the form of volcanic products such as lahars, breccias, tuffaceous sandstones; (v) Podsol, Sedimentary rock is breccia from Halang Formation, while volcanic rock is andesite lava rock from Kumbang Formation; (vi) Gromosol, this soil occupies a moderately undulating hilly area composed of sedimentary rocks, such as sandstone, claystone, mar; and. (vii) Alluvial is found in coastal plains and valley areas. This type of soil is suitable for rice and secondary crops.

3. Water Quality

69. The data on the water quality of Cisanggarung River is limited. The following secondary data series collected from 2008 to 2013¹⁷ summarized as follows:

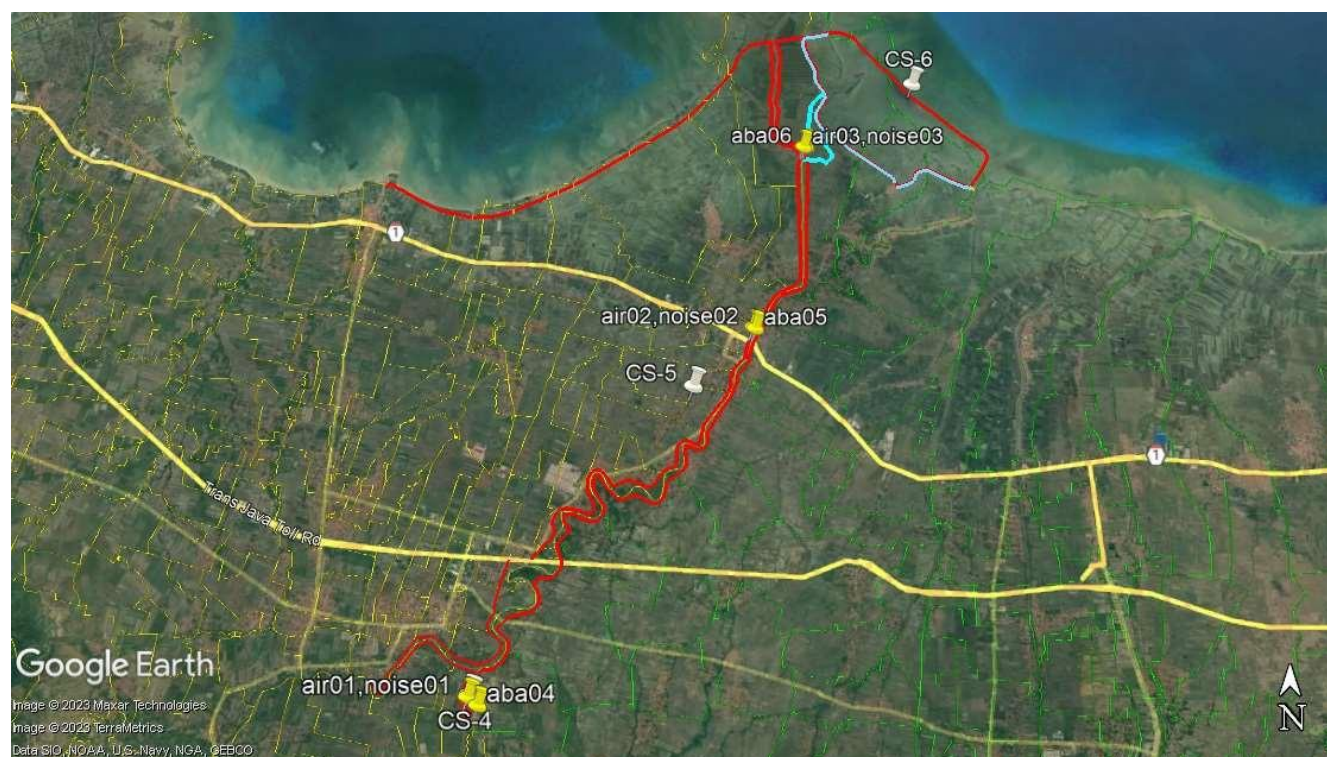
- (i) **Temperature.** The air temperature in the Cisanggarung watershed ranges from 24.5°C to 34.3°C. The temperature upstream of the Cisanggarung Watershed is lower than the downstream area due to the different altitudes and landscape.
- (ii) **Electrical Conductivity (DHL).** DHL ranges from 101 mhos/cm to 980 mhos/cm, which still below the DHL threshold value of 2250 mhos/cm.
- (iii) **pH.** The degree of acidity of the water (pH) ranges from 6.81 to 7.79, which still meets the standard for drinking water from the permissible threshold of 6 to 9.
- (iv) **Total Dissolved Solid (TDS).** The maximum TDS value is 942 mg/l, which still below the threshold value for TDS which is 1000 mg/l.
- (v) **Dissolved Oxygen (DO).** DO ranged from 3.63 mg/l to 13.11 mg/l, which still below the required minimum dissolved oxygen (DO) threshold of higher than 3 mg/l.
- (vi) **Biological Oxygen Demand (BOD).** The BOD ranges from 1.28 mg/l to 46.00 mg/l, which exceed the threshold value of 6 mg/l.
- (vii) **Chemical Oxygen Demand (COD).** The COD ranged from 2.23 mg/l to 115.17 mg/l, which exceeded the threshold value of 10 mg/l.
- (viii) **Ammonia dan Ammonium.** Ammonia levels range from 0.02 mg/l to 1.25 mg/l, which exceed the threshold value of 0.50 mg/l.
- (ix) **Nitrate.** Nitrate ranges from 0.03 to 6.99. The nitrate value is still below the threshold of 10 mg/l.
- (x) **Ortho Phosphate.** Orthophosphate ranges from 0.04 to 3.22, which exceeding the threshold of 0.20 mg/l.
- (xi) **Turbidity.** The turbidity of the water ranges from 1.05 NTU to 1.770 NTU, which exceeded the threshold of 5 NTU.
- (xii) **Coliform/Fecal Coliform Bacteria.** Fecal coliforms ranged from 15,000 to 950,000 MPN/100ml, which exceeded the threshold of 2,000 MPN/100ml.

70. The data shows that BOD, COD, turbidity, nitrate, orthophosphate, ammonium, ammonia, and fecal coliform exceeded the threshold values. Agricultural activities, plantations, and household waste from settlements in the areas contributes to the decreasing water quality.

71. Compared to the water quality standards as stated in Attachment VI of Government Regulation No. 22 of 2021, the water quality of the Cisanggarung is classified as class IV, namely, water that is suitable for irrigating crops and/or other uses that require the same water quality.

72. To complete the data, a laboratory testing conducted for the water quality and noise and air quality. The sampling points for the measurement are presented in the following table and figure.

¹⁷ Setyowati, Diah Nugraheni. 2015. Status Kualitas Air Das Cisanggarung, Jawa Barat. Jurnal Teknik Lingkungan. Vol. (1), No. (1).

Figure 5: Map of Sampling Points for Air Quality, Water Quality and Noise Measurement

Tag	Type of Sampling	Sub-District	District	Coordinate	
CSaba01	Water	Cibingbin	Kuningan	7° 3'24.56"S	108°45'17.56"E
Csair01, noise01	Air, Noise	Ciledug	Cirebon	6°55'25.61"S	108°45'10.29"E
Csaba02	Water	Ciwaru	Kuningan	7° 2'11.83"S	108°38'55.81"E
CSair02, noise02	Air, Noise	Losari	Cirebon	6°50'43.31"S	108°48'44.79"E
CSaba03	Water	Luragung	Kuningan	6°59'45.44"S	108°39'31.15"E
CSair03, noise03	Air, Noise	Losari	Cirebon	6°48'6.70"S	108°49'29.62"E
CSaba04	Water	Losari	Brebes	6°55'31.40"S	108°45'17.85"E
CSaba05	Water	Losari	Cirebon	6°50'44.26"S	108°48'46.41"E
CSaba06	Water	Losari	Cirebon	6°48'6.26"S	108°49'31.51"E

Source: TRTA Consultants.

B. Biological Resources

1. Aquatic Biota

73. The nekton found in the river are various types of fish, among others: Wader/ Spotted Barb (*Barbodes binotatus*), Keting/ Two-Spot Catfish (*Mystus nigriceps*), Sepat/ Moonlight Gourami (*Trichogaster microlepis*), Belanak/ Grey Mullet (*Valamugil speigleri*), Giant Freshwater Prawn (*Macrobrachium rosenbergii*). Those are cultivated, consumed, and caught by people and has economic value. No protected aquatic biota identified in the project location as refer to Indonesia regulations (see Appendix 7)¹⁸

¹⁸ Law No. 05 / 1990 on Conservation of Natural Resources and Ecosystems, Government Regulation No. 07 / 1999 on Preservation of Plants and Animals, and Regulation of the Minister of Environment and Forestry P.106 / MENLHK / SETJEN / KUM.1 / 12 / 2018 on Types of Protected Plants and Animals).

2. Terrestrial Flora and Fauna

74. The ecosystem of the proposed subprojects location consists of riparian areas, rice fields, fishponds, and settlements. Vegetation along the banks of the Cisanggarung river is generally grass and cultivated plants such as paddy, corn, cassavas, elephant grass, bananas, and others. No protected flora found in the areas as refers to the regulation.¹⁹

75. The type of fauna in the Cisanggarung River watershed consists of aves, reptiles, and insects. Insects found are butterflies, dragonflies, grasshoppers, and others. Reptiles found are Asian water monitor, rice paddy snake, and common sun skink. It is shown that protected fauna species were found, which refers to the regulation.²⁰ The protected avifauna groups are Javan Pond Heron (*Ardeola speciosa*), Collared Kingfisher (*Halcyon chloris*), Javan Kingfisher (*Halcyon cyanoventris*), and Little Egret (*Egretta garzetta*). Detailed identification of the flora dan fauna provided in Appendix 7.

3. Protected and Conservation Area

76. The location of the proposed sub-project is aligned and does not conflict with the spatial plan. The compliance has been checked with maps of spatial plan of respective district, as refers to Local Regulations No. 26 of 2011 on Kuningan Spatial Plan of 2011-2031, Local No. 7 of 2018 on Cirebon Spatial Plan of 2018-2038, and No. 13 of 2019 on Brebes Spatial Plan of 2019-2039.

77. In order to confirm the compliance, the RBO has consulted with respective spatial planning agency of the districts. The letter of Brebes's Spatial Planning and Management of Water Resources Agency No. 650/0691/V/2022 confirmed that the location of the subproject in Brebes District is identified as land allocated for Rural and Urban Settlement Areas, Food Crops Areas, River Borders, and Toll Roads. The agency also confirmed that the subproject location complies with the Brebes's Regional Spatial Plan (RTRW).

78. Formally under AMDAL study, the subproject applies for an approval/recommendation for the spatial plan compliance from the local spatial agency and central level ATR/BPN. The letter of Cirebon Public Works and Spatial Planning Office No. 600/387/PR/VI/2022 also confirmed that the location of the subproject is identified as land allocated for Protected Area, Local Protected Area, and Freshwater Aquaculture Area. The agency also confirmed that the subproject location comply with Cirebon's Regional Spatial Plan (RTRW) .

79. The letter of Kuningan Public Works and Spatial Planning Agency No. 650/1063/TR concerning Spatial Information confirmed that the location of the subproject is identified as land allocated for Food Crops in Wetlands, Green Open Spaces, Allotments of Rural Settlements and River Borders. The agency also confirmed that subproject location comply with Kuningan's Regional Spatial Plan (RTRW).

80. At whole, the suprojects location also overlaid with MOEF's map on the protected areas and peatland. Referring to the Decree of the Minister of Environment and Forestry of the Republic of Indonesia Number: SK. 7594/MENLHK-PKTL/IPSDH/PLA.1/9/2022 concerning Indicative Map of New Permit Moratorium, the location of the proposed subproject is not prohibited for the new permit.

¹⁹ See Footnote 19.

²⁰ See Footnote 19.

81. From the above assessment concluded that the subproject location complies with national, provincial and district's spatial plan.

C. Social Economy

82. According to the Central Bureau of Statistics (BPS) Agriculture, Forestry, and Fishery; Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles; Transportation and Storage; Education; and Construction dominate Kuningan economy over last five years (2017-2021). The highest share in 2021 was generated by Agriculture, Forestry, and Fishery sectors. The highest share of GRDP is produced by Agriculture, Forestry, and Fishery which reached 23.91 percent. On the other hand, the Education category was increased since 2017. The regency's economic growth from 2017 to 2019. However, in 2020, it decreased by 0.11 percent. In 2021 was increased by 3.56 percent. In general, the main cause of the changing share is due to the COVID-19 pandemic.

83. According to the Central Bureau of Statistics (BPS) Manufacturing Industry; Agriculture, Forestry, and Fishery; Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles; Construction; Transportation and Storage; Education dominate Cirebon economy over last five years (2017-2021). The regency's economic growth in 2021 for 2.47 percent (this figure decreased from 5.06 percent in 2017). Manufacturing Industry generated the highest share in 2021, and its share of GRDP reached 20.50 percent.

84. According to the Central Bureau of Statistics (BPS) Agriculture, Forestry, and Fishery; Manufacturing; Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles; Education; Accommodation and Food Services Activities dominate Brebes economy over last five years (2017-2021). The highest share in 2021 was generated by Agriculture, Forestry, and Fishery sectors. The sector's share accounted for 36.53 percent (this figure decreased from 37.50 percent in 2020). Among those five dominant, only the manufacturing industry was increased gradually since 2017. At the same time, the share of the other categories tends to be steady.

D. Social Culture

1. Population

85. Based on the 2020 population census, Kuningan has 30 districts with 1,167,686 people in 2020, consisting of 592,009 male and 575,677 female. The population growth rate during 2010 to 2020 is 1.17%. This is lower than in 2020, which was 2.04%, with a population of 1,170,942 people. The total population in the seven sub-districts missed in the project areas is 249,239 people. The largest population is in Malabar Sub-District, with 42,559 people, and the lowest is in the Cibeureum Sub-District, with 19,463 people.

86. The total population of Cirebon based on Disdukcapil data in 2020 is 2,296,999 people, consisting of 1,163,760 male and 1,113,239 female. Compared to the total population in 2019, the population of Cirebon grew by 4.78 percent. While the ratio sex in 2020 is 103 male and female residents, and the population density in Cirebon in 2020 is 2,146 per sq km. The total population of 4 sub-districts in Cirebon is 194,316 people, with the largest population in Losari at 66,047 people.

87. The population of Brebes in 2020 is 1,978,759 people, with a population growth rate of 1.29 percent per year since 2010. Kersana is the most densely populated sub-district. Brebes has 17 sub-districts, but only one sub-district is passed by the Cisanggarung River, namely Losari.

The total population in Losari in 2020 is 133,337 people, with the highest number in Blubuk Village of 2,874 people. The population density in Losari is 1,572 per sq km, with a ratio of 103.

2. Historical or Cultural Sites

88. There is no site or cultural heritage in the vicinity of the subproject location, which is officially registered with the Ministry of Education and Culture of the Republic of Indonesia. However, near the sub-project location, two tombs were sacred by the surrounding community, namely the Mbah Rumsutawi Jaya Tomb in Kedungneng Village, Losari Sub-District (6°52'16.07"S and 108°47'54.95"E), which is 50 meters from the sub-project location. Also, an ancestor of the village tomb in Mekarsari Village, Malabar Sub-District (7°2'27.82"S and 108°34'16.65"E). It is about 60 meters from the sub-project location, and will not affect the the tomb.

3. Indigenous People

89. The traditional community whose location is closest to the sub-project is Kuta traditional village. It is located in Karangpaningal Village, Tambaksari Sub-District, Ciamis, approximately 30 km south of Cibingbin Village, Ciwaru Sub-District, Kuningan.

90. The value system and culture passed down by the ancestors are still closely held by the community. The local wisdom of the indigenous people of Kampung Kuta is the rules of daily behavior, the rules of building houses, respect for sacred places, customs of pregnancy, circumcision, marriage, and other customary ceremonies. Kuta Traditional Village covering an area of 185,195 Ha, is in the valley at an altitude of ±463 m above sea level, surrounded by cliffs as high as 30 to 60 m. The land is used as rice fields, protected forests, and settlements. The number of Kuta Traditional Village residents until the end of 2020 are 253 people. They worked as farmers, traders, and palm sugar makers. Kuta Traditional Village community settlements in the form of a collection of houses built close together according to kinship relations. All houses are in the form of stilt houses made of wood, and the roof is made of thatch.

E. Health

91. The most common diseases in Kuningan are diarrhea and tuberculosis, with 12,455 and 1,616 cases, respectively. The number of outpatients are recorded as 379,929 people, while inpatients are recorded as 55,454 people.

92. The most common type of disease in the Cirebon in 2020 was acute Nasopharyngitis (Common Cold). It is recorded that 186,265,000 people were affected by this disease. And there are 157,077 thousand people affected by non-specific acute respiratory infections. This disease is often associated with symptoms of Covid-19, an outbreak or pandemic that occurs in all over Indonesia, including Cirebon. More morbidity identified in Cirebon in 2020 for female population with 19.43%, while the morbidity for male population recorded as 16.78%. Of these, patients with the disease came from the top 20% of the spending group, with 20.11% of the total.

93. Statistic data of Brebes District (2020) showed the morbidity of 22.59 percent, which more women are sick.. The residents who seek outpatient treatment in 2020, recorded 46.40 percent choose private medical doctors/midwives. Nevertheless, 67.4 percent of sick people chose to self-medicate rather than seek treatment in a health facility. About 30,66 percent felt no need for treatment. Less than 5 percent of the rest chose not to use health facilities for outpatients treatment for various reasons, including no medical expenses, no transportation costs, no means

of transportation, and long service waiting times. The number of new cases in several regencies, including Central Java Province, in 2020 reached 164 cases per 100,000 population, the highest in Brebes. The most common type of infectious disease in Central Java Province is Tuberculosis (TBC or TB).

F. Public Sanitation

94. Sanitation required to create a healthy environment and meet health requirements. The basic sanitary components consist of provision of clean water, provision of fecal disposal, waste management, and the wastewater disposal system. A household is considered have proper sanitation if they have their own or public defecation facilities and a septic tank as a treatment site for human waste.

95. Based data (2020), most residents of Kuningan have defecation facilities (87.42%) with the final disposal of feces using a septic tank/IPAL/SPAL. The water supply used by people taken from various sources, consisting of piped system (24.49%), drilled/pumped wells (36.36%), protected wells/springs (22.47%), unprotected wells/springs (5.21%), and other sources (1.78%).

96. Based on data (2020), most resident of Cirebon(70.41%) have defecation facilities with the final disposal of feces using a septic tank/IPAL/SPAL. The clean water used by people taken from various sources, consisting of bottled/refilled water (0.41%), piped system (9.95%), drilled/pumped wells (54.63%), protected wells/springs (30.66%), and unprotected wells/springs (3.61%), and other sources (0.73%).

97. BPS data (2020) shows that most of Brebes residents (77,65%) have defecation facilities. People use clean water from various sources, consisting of bottled water /refillable water (28%), piped water (25.37%), pumped water (19,71%), protected wells (12.09%), and protected springs (8.73%).

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Project Area of Influence

98. ADB SPS (2009) require that impacts and risks are analyzed for the conditions reflecting pre-construction, construction, and operational stages within the subproject's area of influence. As such, this section reviews potential subproject-related impacts to identify issues requiring further attention and to screen out issues of no relevance. A similar scoping process was carried out in the Indonesia AMDAL system.

99. All proposed subprojects are located in the Cisanggarung River body, but the distance among the subprojects locations is very far, thus, it is expected that there is no interaction of impact among the subprojects during the construction phase. Negative impacts on the environment are expected to occur when excavation and embankment works are carried out during the construction phase. While the main positive impact is expected to occur during the post-construction phase in the form of reduced flood potential in the affected area. The location of subprojects are far from the protected areas, so it is not expected to have a direct effect on the protected areas. The subprojects will be within the properties held by the local government and access to the subproject locations is through the public rights-of-way and existing roads.

100. Impacts and risks were analyzed in the context of the project's area of influence with associated facilities including affected upstream and downstream areas and offsite works such as borrow areas, quarries, spoil disposal areas, waste disposal, transport routes, work camps,

and storage areas. The IEE's area of influence for assessing potential impacts on air, water and noise is about 100-200m from their boundary or median. For biodiversity and eco-system assessment, the coverage however is much wider, covering all vegetation communities and fauna habitats of several kilometers.

101. There are no sensitive receptors such as schools, hospitals, or religious facilities in the area of influence, except some temporary and semi permanent houses as reported and assessed in LARP document of this project.

B. Assessment of Potential Environmental Impacts

102. Anticipated potential impacts resulting from the construction and operation:

- (i) Sediment dredging and removal (transportation and disposal areas);
- (ii) Potential disturbance to biodiversity (at the project site and proposed sediment disposal area);
- (iii) Impact resulting from construction activities and traffic generation (water pollution, soil erosion and sedimentation, air pollution and noise, occupational health and safety, traffic safety and local people access);
- (iv) Loss of riverine and riparian habitat and changes in water quality due to dredging; and
- (v) The potential for disruption to community comfort and negative perceptions of society arising from work at the construction stage that interferes with the sacred cultural place.

103. Subsequently, the potential impacts have been summarized and grouped based on the development phases, i.e., pre-construction phase, construction phase, and post-construction (operation and maintenance phase).

C. Anticipated Impacts and Mitigation Measures

1. Design/Pre Construction Phase

104. Impacts arise from the decisions and actions taken during the design/pre-construction phase described below.

105. **Overall Mitigation Measures.** Mitigation measures during the design/pre-construction phase include planning the project to minimize impacts in site selection and design, and planning the implementation of mitigation measures specified for the construction and operation phases including i) ensuring all approvals and permits are in place; ii) ensuring environmental requirements are incorporated in contract documents; iii) Contractor to prepare a construction Environmental Management Plan (including Dredging Management Plan, Appendix 9) describing how the Contractor will ensure the work complies with the environmental requirements; iv) Community consultation and project information disclosure; v) establish Grievance Redress Mechanism; vi) Contractor to prepare Occupational Health and Safety Plans, and vii) Plan the project to maximize local labor and business participation (enhancing for positive impacts of social-economic aspects).

a. Climate Change Vulnerability

106. Climate change adaptation considerations have been included in the design of proposed subprojects. Climate changes and increasing rainfall intensity will generate frequent flooding.

Changes in the intensity of extreme weather events as well as gradual changes in climate parameters such as precipitation can be damaging to the proposed project.

107. Inadequate attention to this impact can increase the long-term costs of sedimentation management and to the subproject. The impact can increase the likelihood that such investments will fail to deliver the benefits for which they were intended.

108. As shown in the screening (Table 2: Climate Screening, Appendix 1), this subproject is categorized as high score to climate change effects.

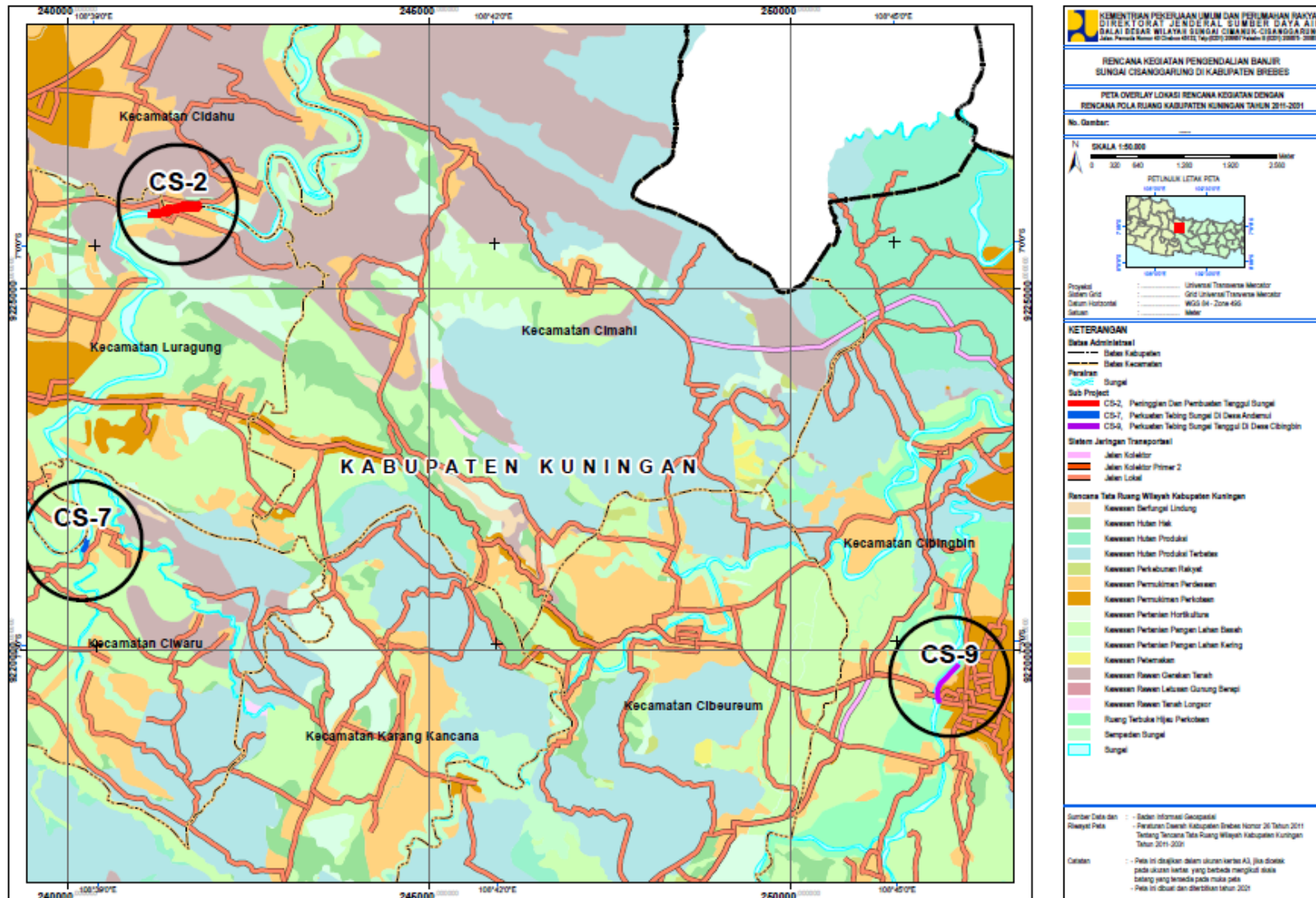
109. To appropriately address this impact, hydrology and hydraulic models were developed for the proposed subproject (during the design phase by considering extreme weather events).²¹

b. Sites Selection

110. **Land Use Change (Site's Conformity to Spatial Plan).** The subproject site complies with the regional spatial planning of Kuningan, Cirebon, and Brebes and riparian zone, as shown in figure below. The project areas are already plotted in each district's spatial plan map (Rencana Tata Ruang Wilayah) for each district for the development of flood structural measures.

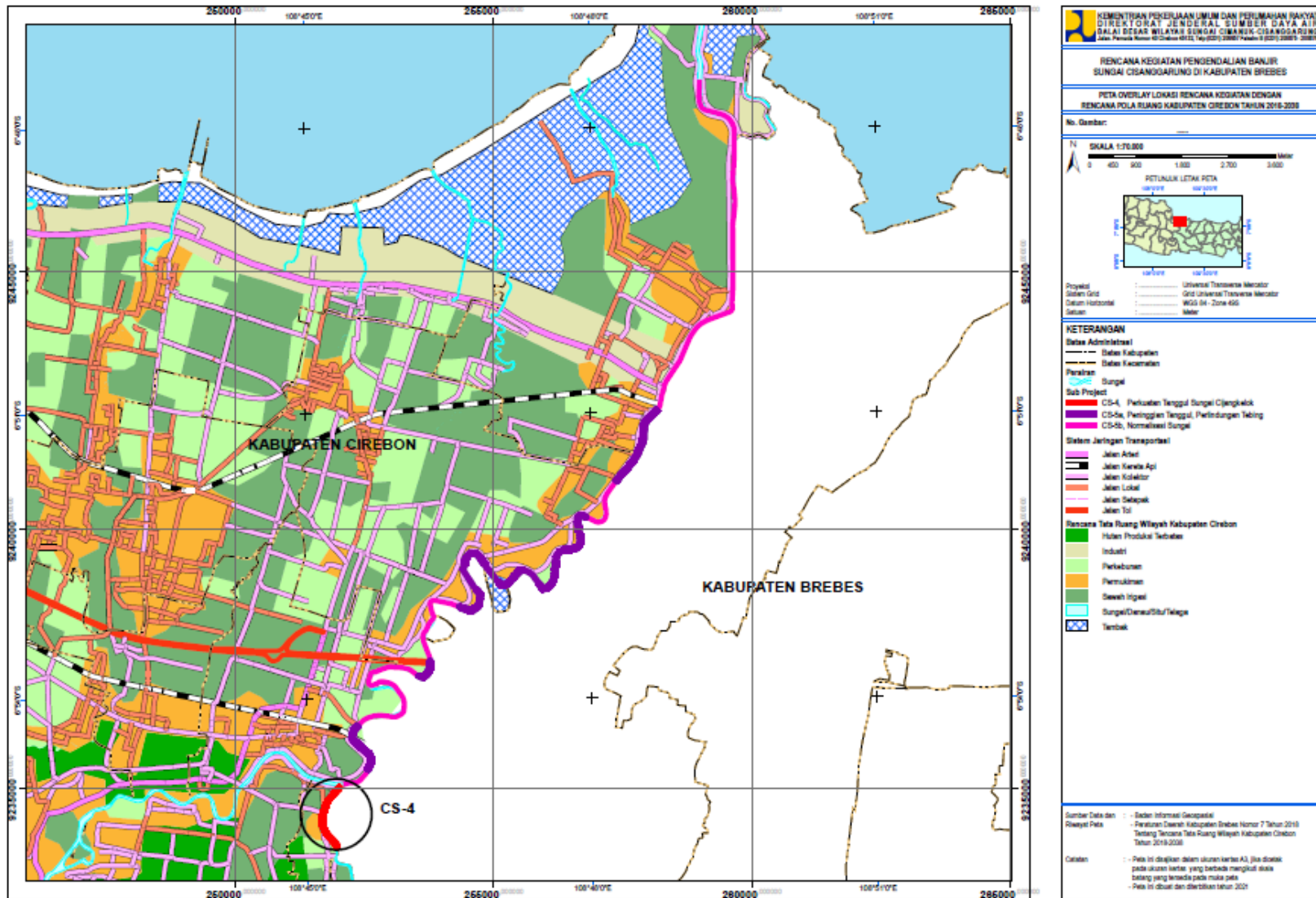
²¹ Climate change projections of GOI's Climatology Meteorology and Geophysics Agency, the Dinas Meteorologi, Klimatologi, dan Geofisika (BMKG) were considered.

Figure 6: Regional Spatial Plan (RTRW) of Kuningan



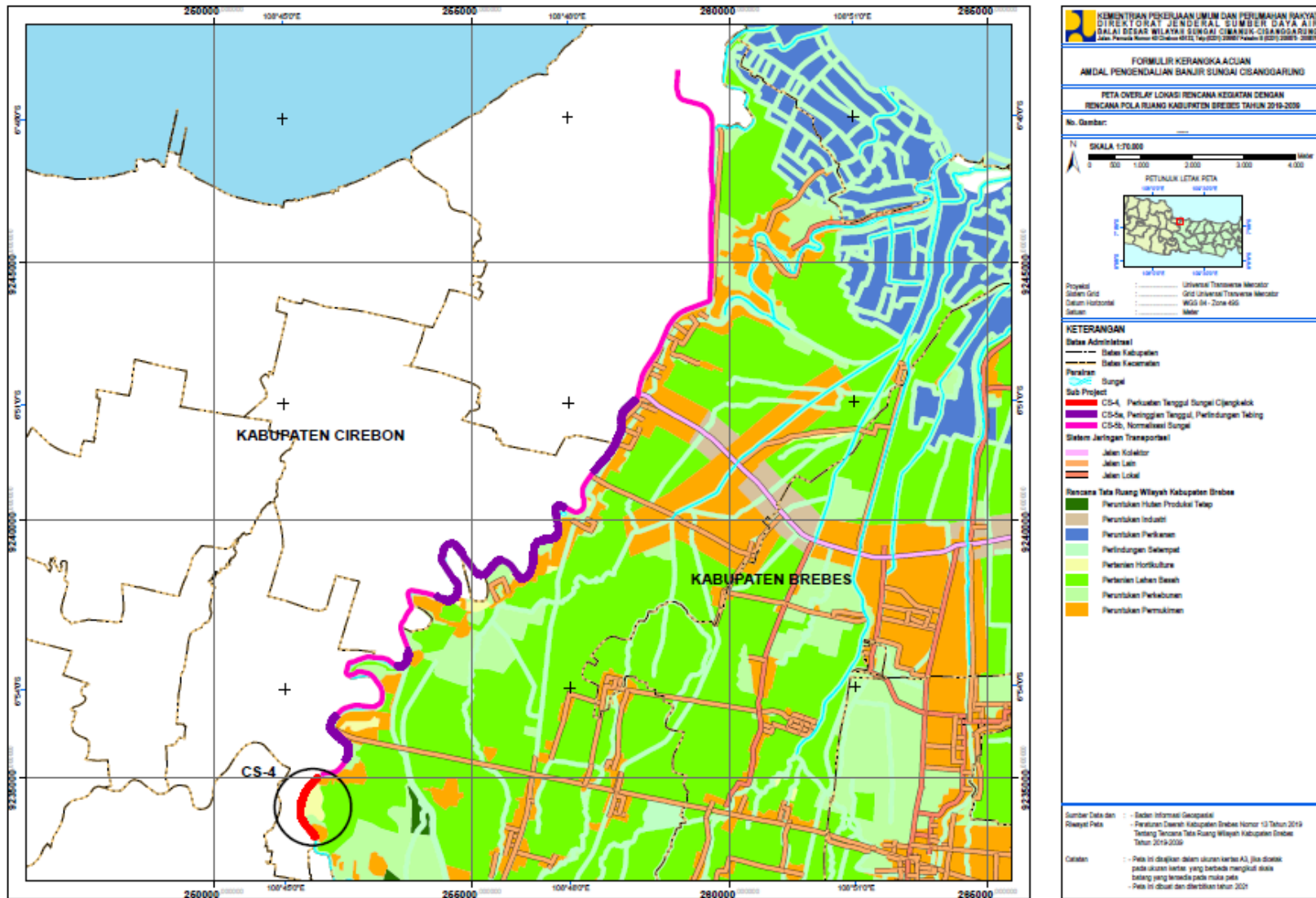
Source: Kuningan Regulation No. 26 of 2011.

Figure 7: Regional Spatial Plan (RTRW) of Cirebon



Source: Cirebon Regulation No. 7 of 2018.

Figure 8: Regional Spatial Plan (RTRW) of Brebes



Source: Brebes Local Regulation No. 13 of 2019.

111. **Encroachments to Environmentally Sensitive Areas.** There will be no encroachments to environmentally sensitive areas affected by the subproject. The subproject sites are not within undisturbed landscapes. The PIPPIB (Indicative Map for Moratorium of New Permit) show that the project area is not at the border or within a protected forest and wetland (Figure 9). The map, which is regularly updated by the Ministry of Environment and Forestry²², indicates that no protected areas are affected along the proposed subproject. This finding is also supported by the Integrated Biodiversity Assessment Tool (IBAT) map generated as part of rapid environmental assessment (REA).

112. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas.** Priority is to locate these facilities near the subproject locations. However, if it is deemed necessary to locate elsewhere, sites to be considered shall not result in the destruction of property, vegetation, and public facilities. High density residential areas will not be considered for setting up camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). Extreme care will be taken to avoid disposals to the forest, water bodies, or areas that will inconvenience the community.

113. **Site selection of materials sources.** Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and waterlogging, and water pollution. To mitigate the potential environmental impacts, locations of quarry site/s and borrow pit/s (for loose material other than stones) would be included in the design specifications and on plan drawings. Local Mineral Resources and Energy Agency (*Dinas Pertambangan dan Energi*) approved sites would be selected first. If other sites are necessary, these would be located away from population centers, drinking water intakes and streams, cultivable lands, and natural drainage systems, and in structurally stable areas even if some distance from construction activities. It will be the contractor's responsibility to verify the suitability of all material sources and to obtain the approval of an authorized agency. If additional quarries are required during construction, the construction contractor shall use the mentioned criteria to select new quarry sites, with the written approval of CPMU.

114. **Dredged Materials and Disposal Areas.** Dredging and excavation generate significant quantities of earth spoil. Management of spoil and disposal of excess spoil has the potential to impact and use, ecology, and water quality. For each subproject involving dredging and generation of excess spoil, the detailed design has been optimized to reuse spoil as much as possible in levee bank construction and other earthworks.

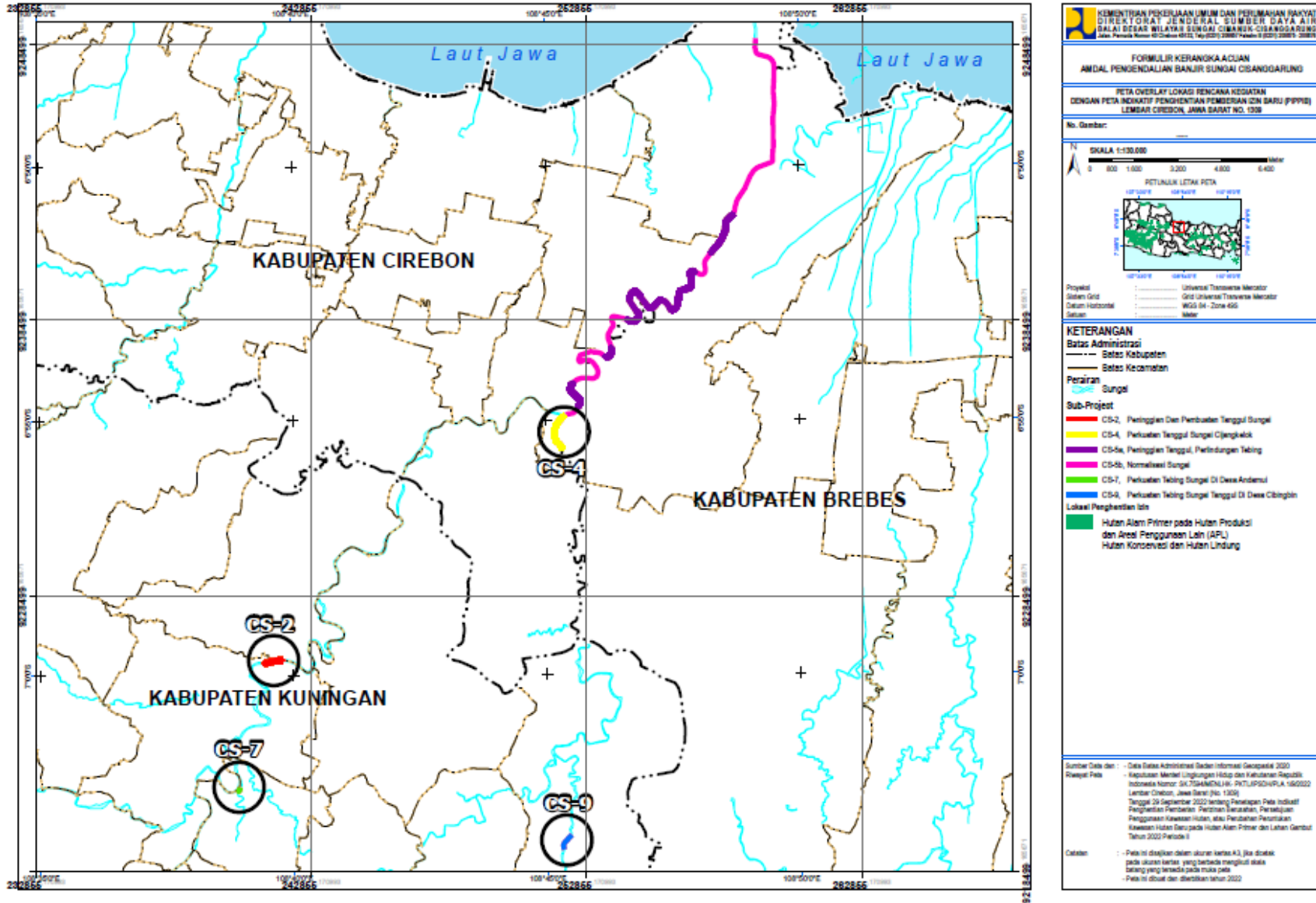
115. The proposed disposal area for the dredged materials (during operational phase of retention pond, construction of drainage channel or during construction for river normalization) has been part of DED activities, which shall include a quantitative analysis of spoil volumes and capacity of disposal sites. For the disposal, it shall be confirmed that the sediment is not categorized as hazardous waste (determined through TCLP method, as presented in Appendix 5).

116. The contractor shall prepare a dredging management plan as part of the contractor's EMP to be submitted for review by relevant agency or ADB as necessary. Each dredging management plan must highlight: key dredging processes; environmental considerations; potential impacts,

²² Keputusan Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia Nomor: SK. 7594/MENLHK-PKTL/IPSDH/PLA.1/9/2022 tentang Penetapan Peta Indikatif Penghentian Pemberian Perizinan Berusaha, Persetujuan Penggunaan Kawasan Hutan, Atau Persetujuan Perubahan Peruntukan Kawasan Hutan Baru Pada Alam Primer dan Lahan Gambut Tahun 2022 Periode II.

mitigation and management; adaptive management strategies; and stakeholder consultation (where applicable). A sample template for the dredging management plan is presented in Appendix 8.

Figure 9: Map of PIPPIB over Proposed Subprojects



Source: Ministry of Public Works and Housing.

117. **Impacts and risks to biodiversity conservation.** The subproject is not be located in areas that have designation for biodiversity conservation. The site will be located in riparian row of way of rural area type. As indicated in Section IV.B.3, biodiversity survey also indicated that there are no concerns on the biodiversity or protected forest around the proposed site and its surrounding.

c. Nuisance and Problems to the Public

118. The tender documents for the proposed sub-project shall include provisions addressing potential nuisances and problems to the public during construction. These shall be reflected in the bidding and construction contracts of the proposed subproject works.

119. During detailed design, construction methods have been chosen by evaluating their applicability (with consideration also to cost implications) and considered areas that are prone to traffic congestion and area with high-density housing and population.

120. The DED also review areas for quarry of construction material, borrow area for soil embankment, and disposal area for sediments. For the sediment testing (if required), the RBO shall also cooperate with a certified third-party service providers to comply with Indonesia's environmental regulations.

121. **Damage to Archaeological and Cultural Assets.** Near the subproject location there are 2 (two) tombs sites that were sacred by the surrounding community, namely the Tomb of Mbah Rumsutawi Jaya in Kedungneng Village, Losari Sub-District (6°52'16.07"S and 108°47'54.95"E), which is 50 meters from the sub-project location. In addition, there is tomb, namely Tomb of Village ancestors in Mekarsari Village, Malabar Sub-District (7°2'27.82"S and 108°34'16.65"E) is 60 meters from the subproject location. Pictures of those tombs are presented in Figure 10.

Figure 10: Cultural Sites Nearest to Subproject Location



The Tomb of Mbah Rumsutawi Jaya



The Tomb of Village ancestor

Source: Ministry of Public Works and Housing.

122. During the construction phase, the contractor will avoid interference with the place that is respected by the community. The contractor will coordinate with caretakers or figures who have authority over the cultural heritage building.

123. Precautions will be taken to avoid potential damage to any archaeological and cultural assets by the inclusion of provisions in tender and construction documents requiring the

contractors to immediately stop excavation activities and promptly inform the local authorities if archaeological and cultural assets are discovered. A “chance finds” procedure will be prepared and included in the construction method.

124. If a cultural heritage object is found during construction activities, then the work must be stopped, and immediately report the findings to the competent authorities in the field of protection of cultural objects, police, and/or other related agencies as stipulated in the Law of the Republic of Indonesia Number 11 of 2010 on Cultural Heritage in Article 23 Paragraph (1) states that anyone who finds objects suspected of being Cultural Conservation Objects, buildings suspected of being Cultural Conservation Buildings, buildings suspected of being Cultural Conservation Buildings, and/or locations suspected of being a Cultural Conservation Site must report it to the competent agency in the field of culture, Police, and/or related agencies no later than 30 (thirty) days after it is found.

2. Construction Phase

125. Construction activities will introduce a range of environmental, social, and safety impacts and risks through the activities including land clearing, excavation, filling, disposal of spoil, and civil works. These impacts can be managed through good practices including IFC EHS Guidelines, and *ADB Environment Safeguards: A Good Practice Sourcebook*.

126. Such temporary, localized impacts only occur during the construction and are manageable through proper mitigation measures set forth in EMP and subsequently made operational in Construction Environmental Management Plan (CEMP), as appropriate. The impacts include but are not limited to the following.

a. Water Pollution

127. Construction activities at and/or around water areas (such as clearing of vegetation, dredging, earthworks, and construction of infrastructure) can have a significant impact on water quality such as increased turbidity via suspension of sediment in the water column. The introduction of pollutants can have adverse impacts on aquatic flora and fauna (including benthic communities), and human health, for example, excessive nutrient loading leading to eutrophication, oxygen depletion, and toxic algal blooms in the water retention ponds.

128. **Soil Erosion and Sedimentation.** Soil erosion may be caused by exposure of soil surfaces to rain and wind during site clearing, earthmoving, and excavation activities. The mobilization and transport of soil particles may, in turn, result in sedimentation of surface drainage networks, which may affect on the quality of natural water systems and ultimately the biological systems that use these waters.

129. **Waste and wastewater from Construction Camps.** The contractor is expected to establish temporary workers’ camps during construction. Depending on the number of workers and their origin. If there is only small number of workers employed and most of them are hired from local source, there is no need to establish a permanent construction camps. The location of the construction camp will be moved following the work progress.

130. Improperly managed silt runoff and sanitary wastes from camps may reach nearby areas. Poor sanitation and lack of proper solid waste management at the worker’s camp will provide the conditions for vermin and other disease vectors that will easily multiply and infect the workers.

This may lead to the transmission of diseases from the worker's camp to other areas. These conditions will increase public health risks.

b. Air Pollution and Noise

131. **Dust and Other Air Pollutants.** Emissions from construction vehicles, equipment, and machinery used for excavation and construction will induce impacts on the air quality at the construction sites. Anticipated impacts include dust and an increase in the concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons).

132. During dry periods, dust may be generated from activities associated with the construction such as trenching, earthworks, and soil preparation. Other potential sources of air pollution are large stockpiles of construction materials such as soil and aggregates. Without any mitigating measures, dust generation could be problematic during dry periods.

133. During the construction phase, there will be two main sources of air emissions, i.e., mobile sources and stationary sources. Mobile sources are mostly vehicles involved in construction activities, whereas emissions from stationary sources include construction equipment and machinery, diesel generator sets, excavation/ grading activities etc. It would not be possible to distinguish between the emissions from project construction vehicles and equipment and emissions from non-project vehicles.

134. Construction-related airborne dust can arise from both vehicular traffic generating fugitive dust on paved and unpaved roads (and especially where there are spillages of soil from construction transport vehicles to the public roads and soil/aggregate material handling and processing). The tender and contract documents will require the Contractor to identify via the Contractor's EMP/ Work Plan methods to control dust and compliance monitoring will be carried out by the Supervising Engineer.

135. **Noise.** Noise will occur during construction due to the use of vehicles, and equipment, movement of materials and various construction activities. Trucks/material mobilization and construction equipment, which can generate noise of 80 dB(A) from a distance of 30 meters are among the potential sources of noise during construction. The issue is mostly applicable in excavation activities.

136. During the construction phase, the noise will be generated from various activities such as site clearing, excavation, erection, and finishing. For example, the operation of heavy earth moving equipment and machinery installation potentially generate noise up to 100 dB(A) at the work sites. It is also to be noted that manual labor will significantly contribute to the works during the construction. Therefore, the noise will be lower.

137. The noise impact would be localized, during working hours only. The impact will be discussed with communities during public consultation.

138. During construction activities, a range of standard mitigation measures will be applied to meet the IFC EHS and GOI standard (whichever is stricter). Nuisance from equipment noise can be mitigated with the use of sound suppression devices for the equipment. In areas near houses/settlements or noise-sensitive sites, noisy equipment shall not be operated during night time to early morning (19:00H – 06:00H). Noise levels due to construction activities should not exceed the objective of 55 dB(A) near schools and residential areas as mandated by the Decree of the Minister of State for the Environment No. 48 of 1996 on Noise Levels Standard and IFC

EHS Guidelines. Temporary noise barriers may be used in areas of high noise impact. Workers using or working near noisy equipment shall be provided with suitable hearing protection.

139. The Contractor shall be responsible for properly maintaining noise-generating machines. The Contractor will be required to produce operational Environmental Management Plans (including methods to control noise) to accompany normal Work Plans for approval by the Supervising Engineer. The Supervising Engineer will be responsible for immediate monitoring of compliance with environmental conditions and under Contract Conditions will be able to enforce immediate remedial action.

c. Occupational Health and Safety

140. Construction activities may pose a risk of exposure to dust, chemicals, hazardous or flammable materials, and wastes in a combination of liquid, solid, or gaseous forms. Vehicular traffic and lifting equipment use in the movement of machinery and materials on a construction site may pose temporary hazards, such as physical contact, spills, dust, emissions, and noise. Slips and falls associated with poor housekeeping, such as excessive waste debris, loose construction materials, liquid spills, and uncontrolled use of electrical cords and ropes on the ground, are also among the most frequent cause of lost time accidents at construction sites.

141. Special precautions for water-related risks shall be implemented. Occupational health and safety planning and procedures shall be implemented in accordance with national standards and IFC EHS Guidelines.

142. **Community Health and Safety.** Impacts may arise from vehicular traffic accidents, nuisance from air pollution, decreasing water quality for public use (washing, bathing, and drinking), disturbance to public access to rivers, and impact on public safety related to excavation, and other construction activities. Community health and safety planning and procedures shall be implemented in accordance with IFC EHS Guidelines. However, as the construction occur mainly in rural area, such impacts might be minimum.

143. **Traffic Safety.** Construction activities may result in a significant increase in the movement of heavy vehicles for the transport of construction materials and equipment which increasing the risk of traffic-related accidents and injuries to workers and local communities. The narrow rural roads might be used for the transport of materials and sediment, which may increases the risk. As the volume of traffic generated below the criteria and the traffic impacts only occurs during construction, no ANDALALIN study required. The incidence of road accidents involving project vehicles during construction should be minimized through sound temporary traffic management planning in consultation with local traffic control authorities, as provided in EMP.

144. **Occupational Health and Safety at Work Sites.** Occupational health and safety planning and procedures shall be implemented in accordance with IFC EHS Guidelines. Hazards may exist in all construction sites in many different forms such as sharp edges, falling objects, flying sparks, chemicals, noise, and various potentially dangerous situations. Good practices in construction occupational health and safety requirements that employers protect their employees from workplace hazards that can cause injury.

145. Implementation of the works shall refer to construction safety standards and Occupational Health and Safety Plan (OHSP), including health protocol for COVID-19, as applied in Indonesia and ADB requirements. The Contractor will train, direct, monitor, and control the contractors' staff on how good work practices are complied with to prevent accidents to the workers and the general public. This shall include, among others, emergency procedures with the required resources, clear

description of responsibilities and management, specific requirements of occupational health and safety policies and regulations, training requirements, and site safety rules.

d. Access of Local People

146. **Reduced Access to the Riparian Area.** Access to the river and other works areas will be restricted during construction due to public safety requirements. This may affect local activities of local people who use river floodplains as agricultural land, livestock, or other economic activities. LARP report (as complementary to this draft IEE) already identified and proposed the handling of the social related issues of the people occupying the riparian area. Local communities will be consulted about this during construction and mitigation measures shall be put in place to address any concerns, where feasible.

e. Biodiversity (Flora and Fauna)

147. Construction of the subproject will require the clearing of riparian vegetation at several spots. During the field survey, the areas were assessed and found that they are farmland/gardens with vegetation in the form of grass and cultivated crops. No flora or fauna was found that was protected, threatened, or had conservation value. Therefore, it is expected that there will be no significant impacts on biodiversity.

148. All works are required to avoid natural/critical vegetation and habitats, including for the proposed disposal areas. For modified habitats, any loss of biodiversity shall be avoided but was not feasible, then the subproject shall ensure no net loss of biodiversity through minimizing, mitigating, and offsetting impacts.

149. It was also found that there will be no impacts on listed, rare, endangered, vulnerable, or threatened species of flora or fauna or communities as there are none potentially affected by the project, as per the secondary data and field survey conducted by the AMDAL's subcontractor. This includes the IUCN Red List or as defined in any national legislation.

150. The project will manage potential impacts on other fishes captured by local people for consumption, especially at the down stream.

151. There are no areas of "Critical Habitats" that might be impacted²³:

152. The project will not significantly convert or degrade²⁴ "Natural Habitats" as a result of the project, as defined in the *Asian Development Bank Safeguards Policy Statement, 2009*.²⁵

²³ "Critical Habitat: A subset of both natural and modified habitat that deserves particular attention. Critical habitat includes areas with high biodiversity value, including habitat required for the survival of critically endangered or endangered species; areas having special significance for endemic or restricted-range species; sites that are critical for the survival of migratory species; areas supporting globally significant concentrations or numbers of individuals of congregatory species; areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services; and areas having biodiversity of significant social, economic, or cultural importance to local communities."

²⁴

²⁵ "Natural Habitat: Land and water areas where the biological communities are formed largely by native plant and animal species, and where human activity has not essentially modified the area's primary ecological functions." The significant conversion or degradation is (i) the elimination or severe diminution of the integrity of a habitat caused by a major, long-term change in land or water use; or (ii) the modification of a habitat that substantially reduces the habitat's ability to maintain viable populations of its native species. Significant conversion may include, for example, land clearing; replacement of natural vegetation (for example, by crops or tree plantations); permanent flooding (by

153. There will be no impacts on the ecological components as identified in the national, provincial or district requirements.²⁶

f. Impact on physical cultural resources

154. **Potential Damage to Archaeological and Cultural Assets.** Although at present there is no significant archaeological and cultural assets that identified during this IEE, this potential impact during construction phase requires precautionary measures.

155. The consultation will be carried out with authorities, experts, local organizations, and local people to identify the likely presence of archaeological and cultural assets potentially affected by the works. Construction contract documents will include provisions requiring the contractors to immediately stop excavation activities and promptly inform the local authorities if archaeological and cultural assets are discovered. Anticipating the possible finding, a “chance finds” procedure is included in CEMP.

g. Construction Wastes and Closure

156. **Non-Hazardous and Hazardous Waste.** The non-hazardous solid waste generated during construction activities includes inert debris from damaged facilities, excess fill materials from grading and excavation activities, scrap wood, and metals. Other non-hazardous solid wastes include office, kitchen, and workcamp wastes. Hazardous solid waste includes asbestos-containing demolition waste, contaminated soils, which could potentially be encountered on-site due to previous land use activities, or small amounts of machinery maintenance materials, such as oily rags, used oil filters, and used oil, as well as spill clean-up materials from oil and fuel spills.

157. **Oil and other hazardous materials are released.** The presence of oil products and other hazardous materials is expected in the construction, which includes fuel, oil, grease, paints, and solvents. These materials are associated with the operation of heavy equipment and vehicles and various construction activities. Some of these materials may accidentally be released into the environment.

158. The Contractors will be required to raise an awareness for all workers regarding the prevention and management of spills and proper disposal of used containers. Fuel and oil shall be stored in a designated secured area provided with an impermeable liner to prevent accidental spills from seeping into the ground. The hazardous waste management will refer to Gol Regulation No. 22/2021 (Appendix IX).

a reservoir for instance); drainage, dredging, filling, or canalization of wetlands; or surface mining (SPS, Appendix 1, Section 8).

²⁶ Ass per the regulations including Law No. 11/2013 on Ratification of Nagoya Protocol on Access to Genetic Resources and Fair and Balanced Benefit Sharing of Its Utilization upon Biodiversity Convention; Law 18/2013 on Prevention and Eradication of Forest Destruction; Decree of Minister of Environment No. 62/2013 on Managing Agency for the Reduction of Emissions from Deforestation and Degradation of Forests and Peatlands; Government Regulation of the Republic of Indonesia No. 07 / 1999 on The Preservation of The Type of Plant and Animal; Government Regulation of The Republic Of Indonesia No. 8/1999 on Utilization of Wild Plants and Animals Species; Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.106 / MENLHK / SETJEN / KUM.1 / 12 / 2018 on The Types of Protected Plants and Animals.

h. Social Economic Impacts

159. **Increased Employment Opportunities at Work Sites.** The impacts are expected to be beneficial and significant since employment opportunities in the area will increase during the construction period.

160. Whenever possible, the Contractor shall be required to use available local labor for these construction activities. The recruitment of workers shall be coordinated with the local officials. Referring to baseline data (Section IV.D), there are enough qualified workers/laborers and some of them are unemployed. The community also expressed during public consultation to be involved as a construction workforce.

161. **Maintaining Labor Standard.** The Contractor and PMU are responsible for ensuring that international labor standards— as reflected in national labor laws and regulations are adhered to. PMU is ultimately responsible for monitoring compliance with national labor laws and regulations, provided that these national laws are consistent with international labor standards. PMU or PIU will ensure that bidding and contract documents include specific provisions requiring contractors to comply with all: (i) applicable labor laws and labor standards on: (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity; and (c) elimination of forced labor; and (ii) the requirement to disseminate information on sexually transmitted diseases including HIV/AIDS and COVID-19 to employees and local communities surrounding the project sites. These will be monitored as part of the project's safeguards reporting requirements.

3. Operational and Maintenance Phase

162. Operation and maintenance of flood management infrastructure will generate a range of potential environmental impacts and risks which are identified and mitigated in EMP, including, among others:

- (i) Loss or reduction of lateral connectivity between the main river channel and floodplains.
- (ii) Loss of riverine and riparian habitat and changes in water quality due to dredging.
- (iii) Spillage during transport of dredged materials (if it is not at the river right of way).
- (iv) Loss of biodiversity at the disposal area of dredged materials.
- (v) Aesthetic and safety issues of dumping dredged materials at areas nearby people residents.

D. Cumulative Environmental Impacts

163. **Cumulative Effects.** The cumulative effects would be the increasing volume of sediment to be disposed of and difficulty to find suitable areas for disposal areas.

164. Indirect impacts are adverse and/or beneficial environmental impacts that cannot be immediately traced to a subproject activity but can be causally linked. Induced impacts are adverse and/or beneficial impacts on areas and communities from unintended but predictable developments caused by a subproject that may occur later or at a different location.

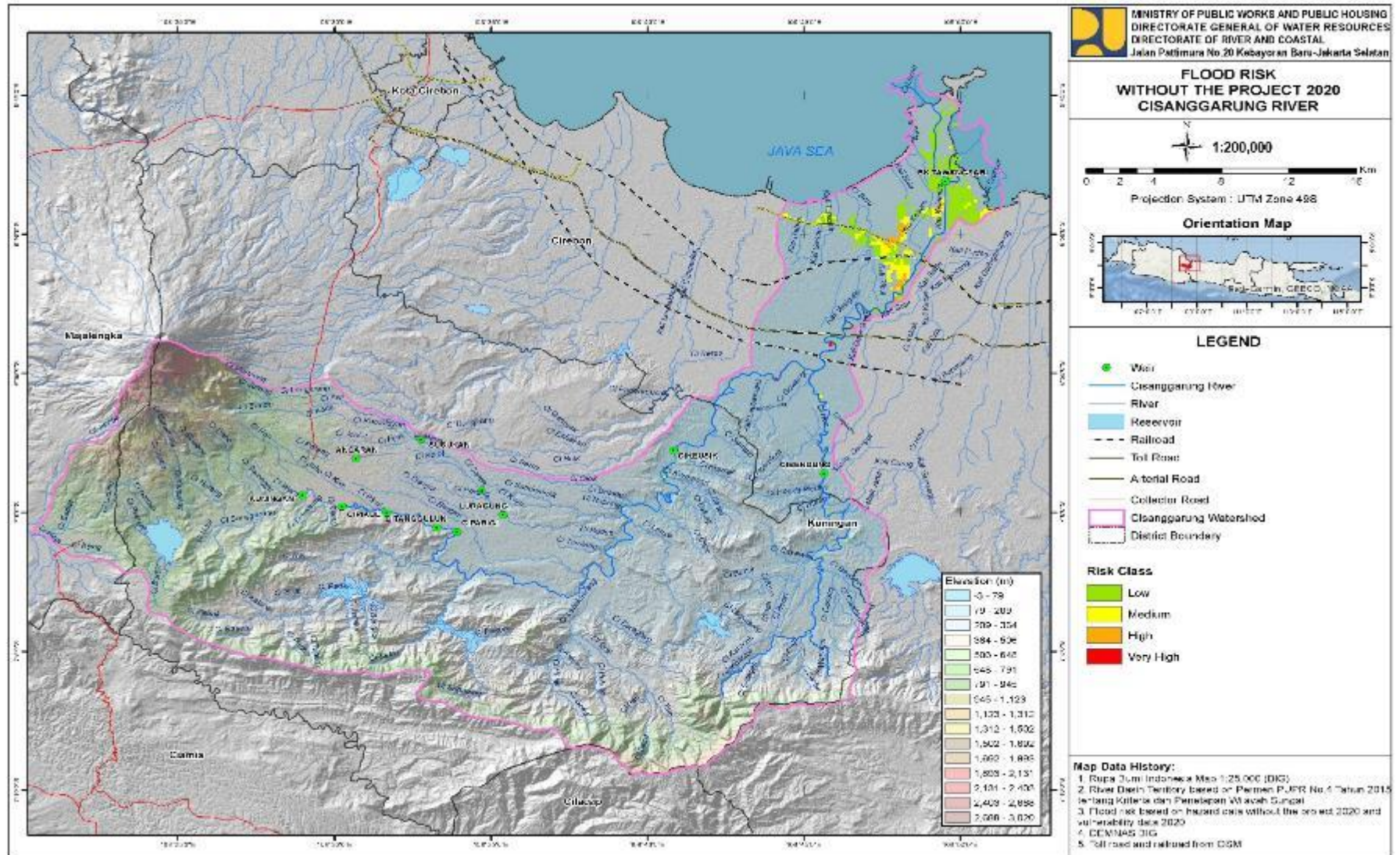
165. Other activities that would potentially add cumulative impacts of sedimentation, especially agriculture. As refer to the study in the Upper Cimanuk watershed the agricultural activities contribute to the increase of BOD, N, P, TSS, and pesticides. In addition, the dryland farming also

contribute as a source of pollutant load in BOD parameter amounts to 15143.66 kg/day ; N parameter at 4,85 kg/day; P parameter at 34924.91 kg/day; TSS parameter at 1,17 kg/day; and pesticide parameter at 558.80 kg/day.²⁷

166. The operation of flood control infrastructure is expected to impact positively, especially a decrease in the potential for flooding. The design team has simulated flood scenarios based on Q25 before and after handling conditions, as shown in Figure 11 to Figure 14.

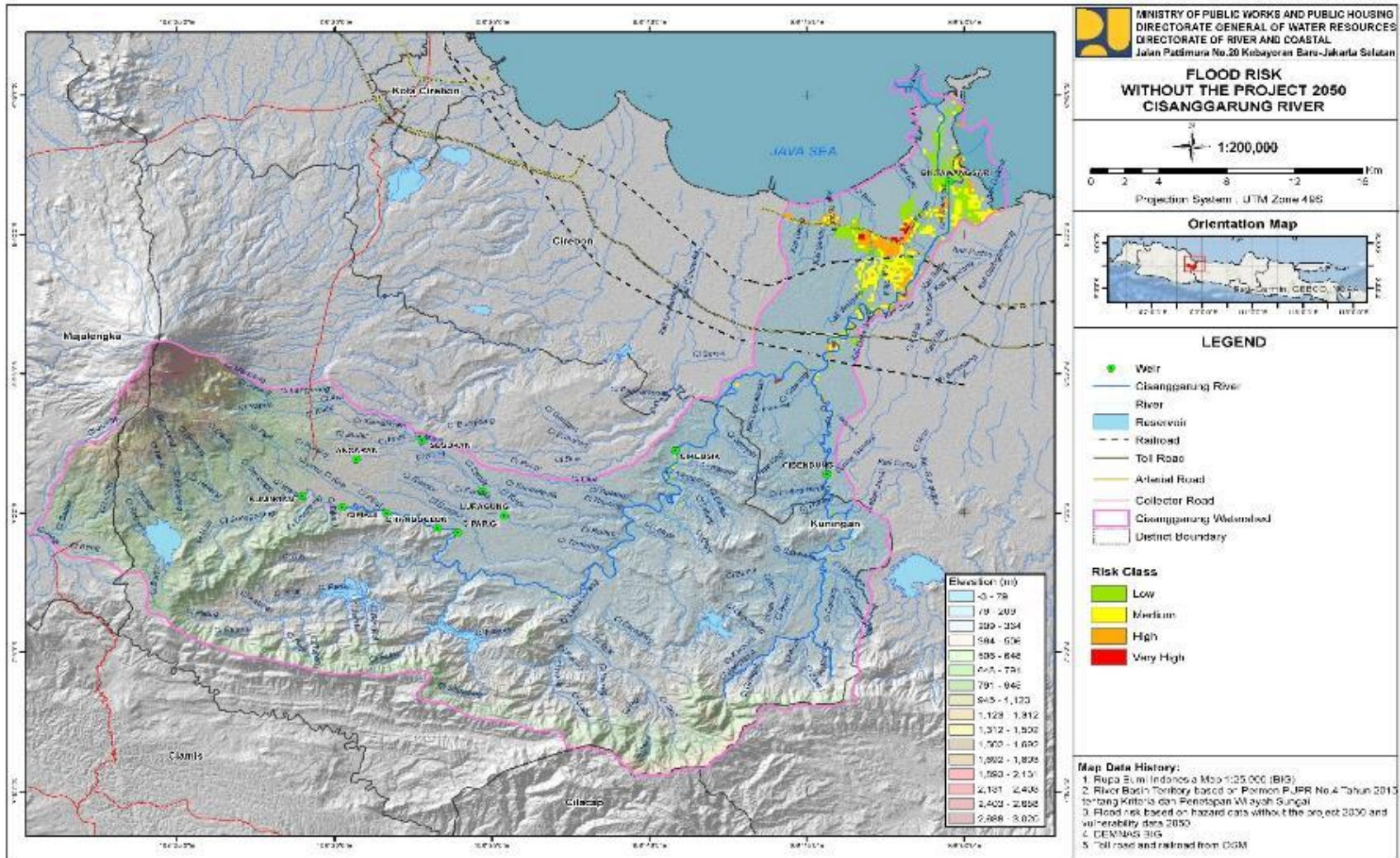
²⁷ Hatmoko, et al, "The Impact of Agricultural Activities on Load Capacity in the Upper Cimannuk", Indian Journal of Research, Volume VI/ December 2017

Figure 11: Flood Risk Map of Cisanggarung River Without the Project in 2020



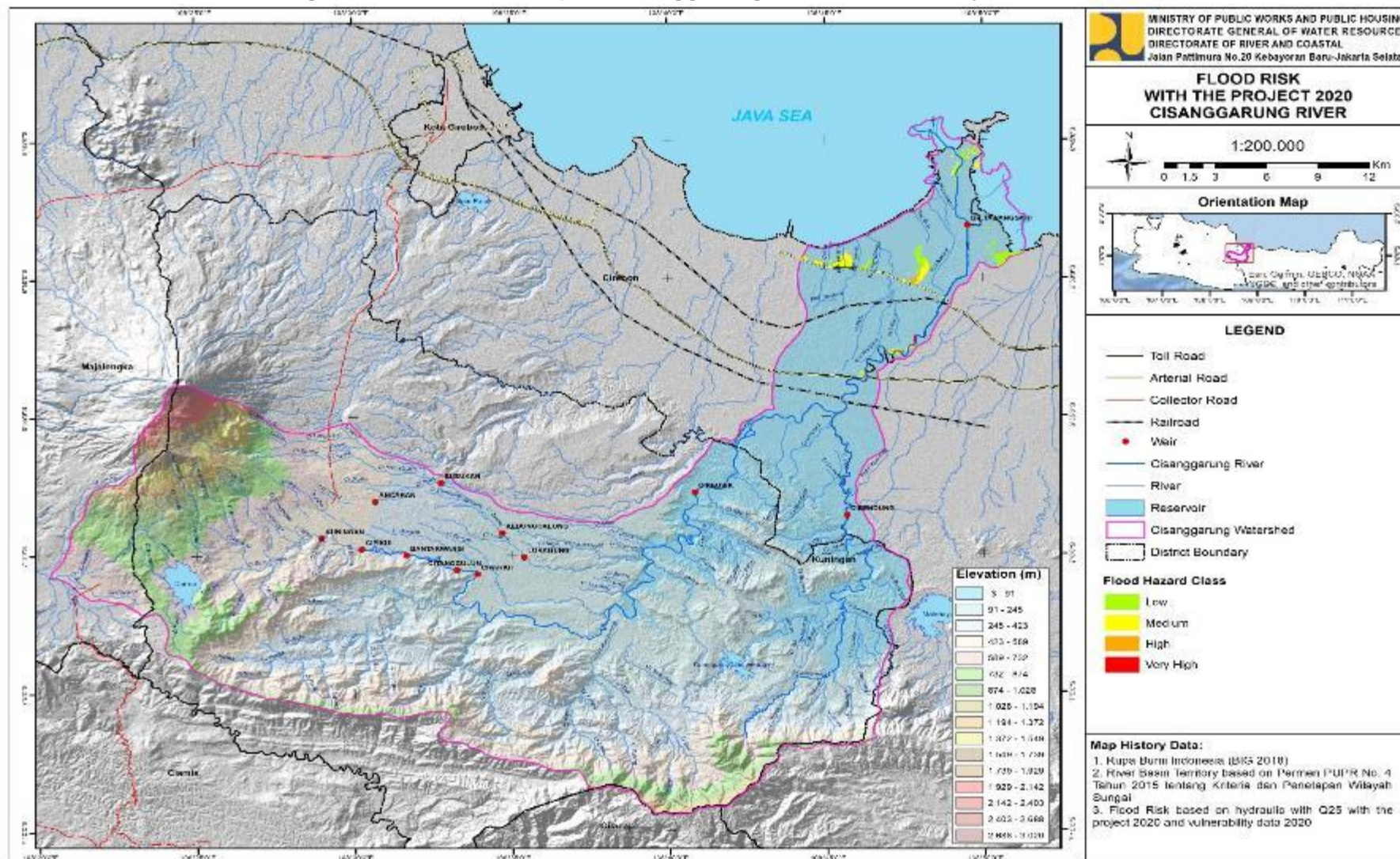
Source: Ministry of Public Works and Public Housing.

Figure 12: Flood Risk Map of Cisanggarung River Without the Project in 2050



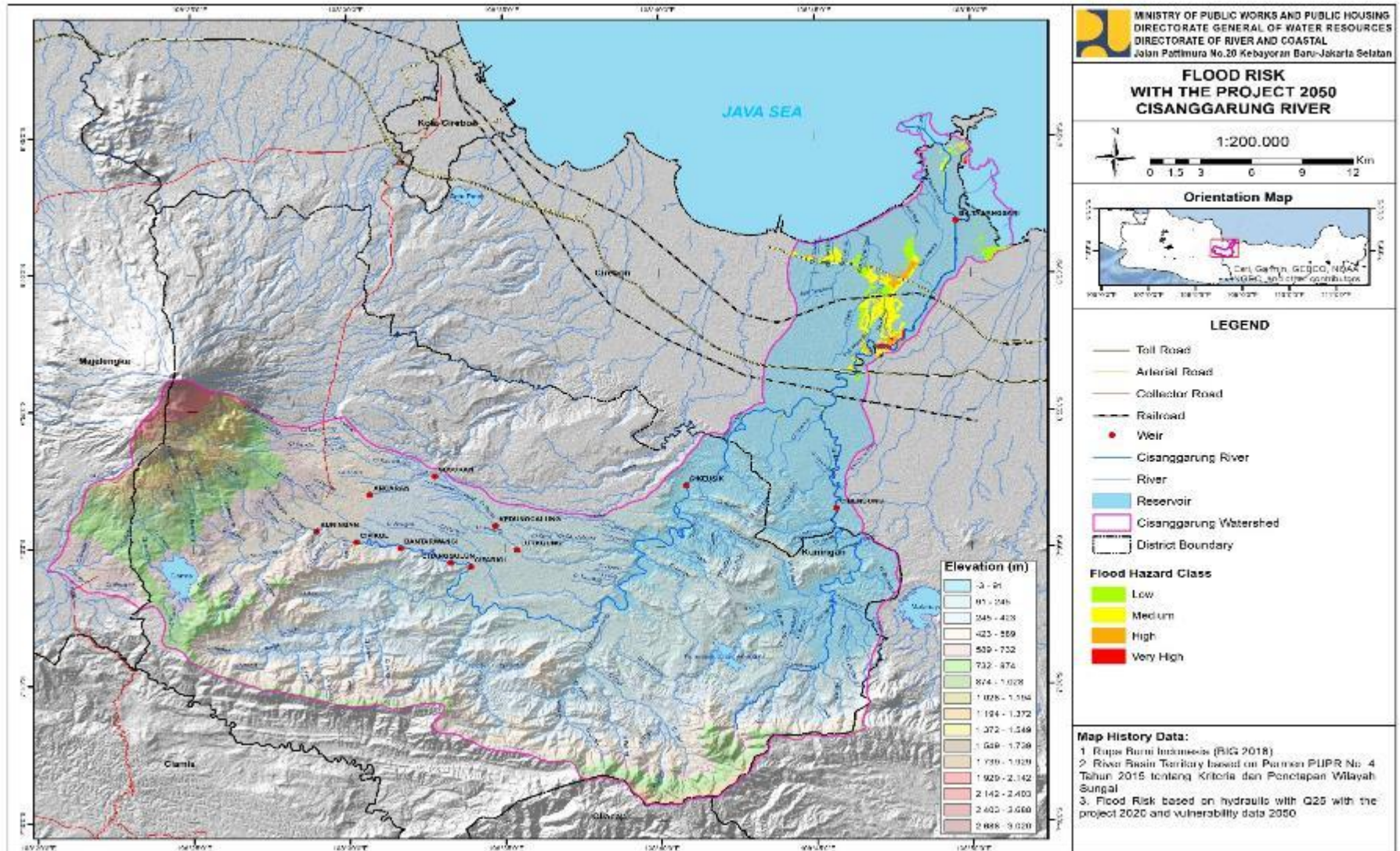
Source: Ministry of Public Works and Public Housing.

Figure 13: Flood Risk Map of Cisanggarung River With the Project in 2020



Source: Ministry of Public Works and Public Housing.

Figure 14: Flood Risk Map of Cisanggarung River With the Project in 2050



Source: Ministry of Public Works and Public Housing.

E. Climate Change Impacts

167. In reference to REA (Checklist for Preliminary Climate Risk Screening), the subproject is categorized as Medium to High. The subproject has been designed to accommodate potential water level increase, and by considering associated hydro-meteorological parameters and future climate change conditions.

VI. ANALYSIS OF ALTERNATIVES

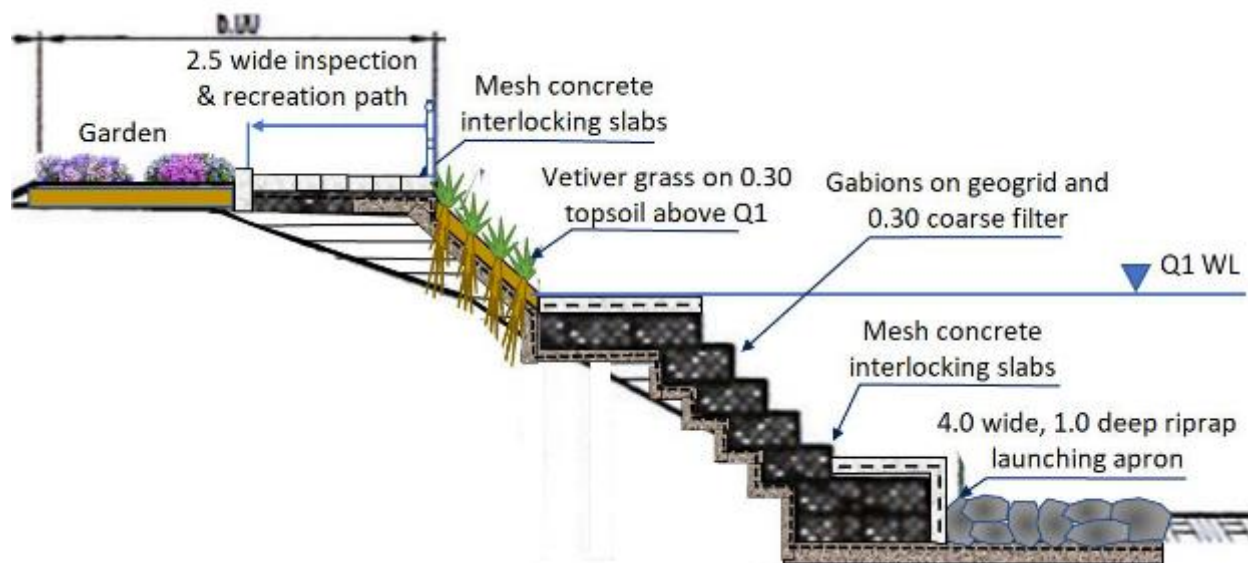
168. An analysis of subproject alternatives was undertaken during the pre-feasibility phase by PPC to determine the most financially and technically feasible way of achieving the project objectives while minimizing environmental and social impacts.

169. The consequences of the “no-project” alternative are a continuation of current conditions, which was identified in the TRTA pre-feasibility report as Scenario 1. Without the project, the existing condition of poor flood management will continue. With the subproject, as proposed by RBO (identified in the TRTA pre-feasibility report as Scenario 2), and enhancements proposed by the project (identified in the TRTA pre-feasibility report as Scenario 3), the area will be protected from severe flood.

170. The Cimanuk Assessment Report (PFS) and the Cimanuk FRM Master Plan of FMNJP recommended to incorporate NBS solutions in the designs. This was particularly stressed in replacing hard surfaces with NBS designs and in particular the use of vetiver grass, other vegetation and gabions rather than concrete to stabilise slopes and resist river erosion and scour. The selection of NBS has several advantages, among others:

- (i) they are normally less expensive;
- (ii) they are regenerative and can be used as basic material for future works;
- (iii) they facilitate bioremediation to improve water quality;
- (iv) they support biodiversity;
- (v) they can be of use to local communities as fodder crops and enhance aquaculture if properly managed;
- (vi) they generally look better; and
- (vii) they absorb carbon dioxide whereas steel production and transport per ton creates 1.5 tons of CO₂ and concrete 0.24 tons of CO₂ per cubic meter of concrete.

Figure 15: Typical NBS river protection on medium slope



Source: Ministry of Public Works and Public Housing.

171. There is some excavation, bank strengthening and protection at bends using hybrid NBS protection by combining vetiver grass bank strengthening mainly above water levels with gabions below. NBS has been considered and combined with structural measures.

VII. INFORMATION OF DISCLOSURE, CONSULTATION, AND PARTICIPATION

172. The Implementing Agency (IA) works with the district, province, and national agencies and local communities on a regular basis.

173. RBO met with provincial representatives, local organizations, and community representatives in all locations proposed for the project also including relevant agencies, and NGOs. This included the identification of suitable alternative sites, land ownership, and other local issues.

174. Further consultation and participation will continue through the construction and operation phase. This includes keeping local communities and stakeholders informed of the project and establishing a Grievance Redress Mechanism to receive and address complaints and concerns.

175. **Information Disclosure.** The project documents will be published on the ADB website. Environmental assessment documents will be made available to the public as part of the Indonesia approval process.

176. The public consultation was carried out on February 8th, 2022, which was intended to inform people about the proposed projects. Summary of the target group, agenda, etc of the public consultation is documented in Appendix 9.

177. Before the public consultation, coordination was carried out with local environmental agencies and also authorized officials in the local area. Due to a Restriction on Community Activities (PPKM) in the local area, public consultation was carried out in several sessions

complied with health protocols for the prevention of *coronavirus disease* (COVID-19) transmission).

178. Some suggestions, inputs, and opinions from the community in public consultation are outlined below.

- (i) People concern on land acquisition because some of the subproject components requires land, and residents also use riparian area for economic activities. They expect the commensurate compensation for the land.
- (ii) People worry their activities or access will be disrupted due to impacts of heavy equipment operation, transportation, and mobilization of heavy equipment, which also generate potential impacts of noise.
- (iii) People worry about mobilization of heavy equipment during construction will damage village facilities such as road. They expect the facilities will be repaired for its initial condition or better.
- (iv) People asked for the rehabilitation of several abandoned drains. In particular they expect the good quality construction to ensure its proper function. Therefore, the rehabilitated embankment does not collapse and cause flooding
- (v) People expect the relevant government to raise the issue of land conversion to become a river border or forest border at the upper Cisanggarung River and call for reforestation.

179. **Future Disclosure and Consultations.** Public consultation and participation activities will be conducted in the future during the construction and operation phase. The RBO will host public consultations and information disclosure throughout the construction phase on an area-by-area basis to sort out any potential problems. These shall be done by the PIU, PMU, and contractors prior to actual construction activities. In these construction consultations, specific concerns of the people such as the disturbance associated with the excavations in their area shall be discussed in detail. The records of environmental and social complaints, received during consultations, field visits, informal discussions, and/or formal letters, together with the subsequent follow-up and resolutions of issues shall be kept.

VIII. GRIEVANCE REDRESS MECHANISM

180. In compliance with ADB SPS (2009), the project will establish a Grievance Redress Mechanism (GRM) for receiving and resolving grievances including complaints and concerns from affected people and stakeholders about environmental and socioeconomic issues in relation to the project. Complaints are to be resolved promptly with a process that can readily be understood and accessed by all segments of affected people and is responsive to gender and cultural aspects.

181. The RBO and the Contractor will inform and consult each community about the GRM and how it will work via a community meeting held before construction commences. Signs at the sites and notices on community notice boards will give the contact details for lodging complaints.

182. Grievances, complaints, and concerns can be lodged with the RBO or the Contractor on site. A GRM Register will be kept on-site in which complaints are recorded. The grievance will be assessed by the RBO to confirm that it is related to the project. If it is urgent or can be immediately resolved, action will be taken and recorded in the GRM Register and the complainant informed. The complaints to be responded within one week. Where this cannot occur, the complainant will be advised on what action to be taken. If a complainant approaches the Contractor directly, the Contractor will receive the information and pass it on to the RBO. The Contractor will take any

immediate action necessary to resolve the issue if practical and appropriate. Where there is urgency in terms of safety, damage to property, or the environment, then this will be acted on urgently manner. The proposed .timeline for the GRM as follows.

Table 13: Proposed Timeline for GRM

Stage	Activities/Responses	Timeline (Maximum Working Days)
1	Submission of Complaints	1
2	Registration, Eligibility Assessment, and Confirmation of Eligibility	3
3	Assessment and Identification of Action	10
4	Confirmation by Affected Person, or First Appeal	10
5	Review, Eligibility Assessment and Confirmation of Appeal by City Level GRC	3
6	Assessment and Identification of Action by City Level GRC	10
7	Confirmation by Affected Person, or Second Appeal	10
	Implementation of Action, Monitoring, Reporting	as defined in the Decision and time-bound action plan
	Closure of Complaint	

Source: LARP - FMNJP (2022).

183. Regular meetings between the Contractor and RBO will review the complaints register as part of regular meetings and reporting. A brief summary of complaints will be given in regular reports and any outstanding grievances identified. The RBO Environmental Officer will review the GRM Register for complaints and confirm that they are resolved satisfactorily. Any outstanding complaints will be investigated. The RBO and Contractor will work together proactively to ensure grievances are satisfactorily resolved.

184. Where complaints cannot be resolved by the GRM process the complainant will be able to take their complaint to normal legal processes.

185. Training in awareness of the GRM will be provided to the IA and Contractor staff. There will be no fees or charges made in relation to lodging complaints or otherwise accessing the GRM.

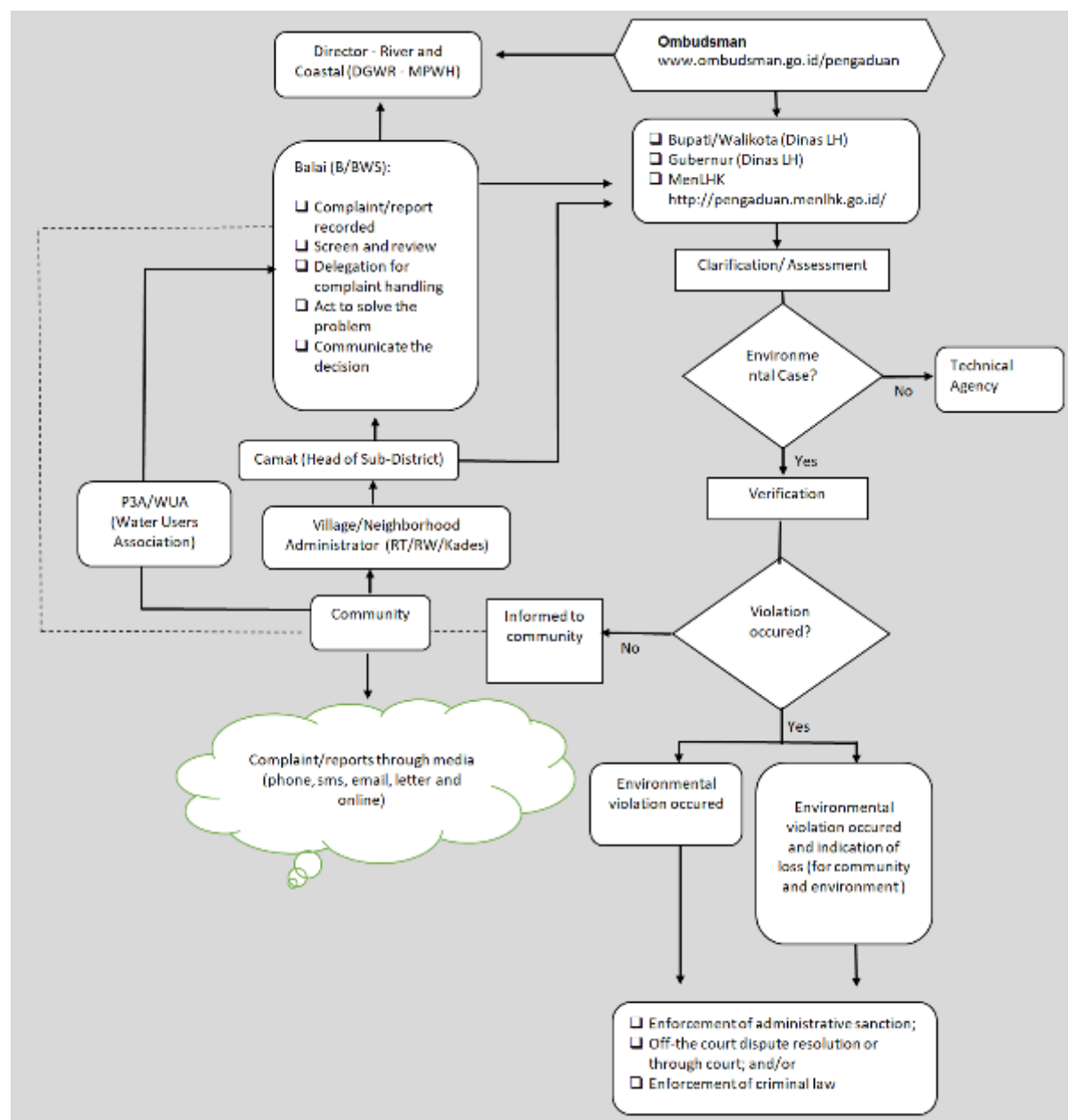
186. Typical grievances that may occur in projects of this nature may include (but not limited to) damage to or use of public or private property or communal resources, safety risks or incidents, noise, dust, fumes, water pollution, litter, rubbish dumping, unauthorised land use, unauthorised tree cutting or vegetation removal, hunting, antisocial or criminal behaviour and harassment.

187. Any complaints and concerns of the affected people must be addressed promptly at no costs to the complainant and without retribution. There will be two GRMs for this Subproject. The first one shall address the grievances associated directly with the construction activities, while the second one shall address the grievances on land acquisition, compensation and resettlement (this will be covered under Social Safeguard). The GRM for the construction activities shall be explained fully to the various areas where construction activities are expected prior to the start of construction when Contractors are already selected at that time. This is appropriately done during public consultations in the detailed design phase when actual alignments will have been made for the proposed works.

F. Complaint to Environmental Agency

188. Complaints about environmental performance of projects can also be brought to the local agency responsible for enforcing the AMDAL system. The Agency is also involved in monitoring the water quality of the rivers.

Figure 16: Typical Flowchart for GRM in DGWR – MPWH



Source: Ministry of Public Works and Public Housing.

IX. ENVIRONMENT MANAGEMENT PLAN

189. This section addresses the need for mitigation and management measures for the subprojects, which include: i) mitigating measures to be implemented, and ii) required monitoring associated with the mitigating measures. The institutional setup, as presented in the implementation arrangement (in section X) discusses the roles during implementation and the required monitoring. It also outlines the requirements and responsibilities during the pre-construction, construction, and operation phases.

A. Environmental Mitigation and Management Plan

190. Table 14 presents the information on EMP including (i) required measures for each environmental impact that requires mitigation; (ii) locations where the measures apply, (iii) associated cost, and (iv) responsibility for implementing the measures. The details of mitigating measures were discussed in Section 5, where the need for mitigation of each impact was determined in the scoping process.

191. **Budget for Environmental Mitigation Measures of Construction.** During the pre-construction phase, the RBO will prepare tender documents with provisions for the required environmental measures conduct meetings for stakeholders' consultations. During construction, all costs of environmental mitigation measures shall be borne by the contractor and are considered part of their contracts as specified in the technical specifications. For budgetary purposes, this can be estimated at 1 - 3% of the total direct cost of the FRM works. The tender documents shall include a lump sum bid item in the bill of quantities to be titled "Environmental Mitigation Measures". During the operation phase, all cost of mitigation measures are part of the operation and maintenance costs of flood control infrastructure, while some were already included in the construction of particular items. The project will provide capacity building including environment.

192. **Tender Documents and Construction Contracts.** The EMP of the subproject shall form part of the bidding and contract documents. This includes the contractor's submittal of a Construction's EMP (CEMP) within a month prior to the construction. Tender documents and construction contracts shall therefore include environmental management provisions on the following issues: (i) erosion and sediment runoff, (ii) noise and dust, (iii) vehicular traffic, (iv) construction wastes, (v) oil and fuel spillages, (vi) construction camps, (vii) public safety and convenience, (viii) occupational health and safety, (ix) proper closure of construction sites, and (x) potential damage to any archaeological and cultural assets.

193. **Construction's EMP.** During construction, each contractor shall be guided by its detailed CEMP. This shall be based on the EMP with details on staff, resources, implementation schedules, and monitoring procedures. It shall include specifications on requirements for dust control, erosion and sediment control, avoidance of casual standing water, management of solid wastes, workers' camp sanitation, pollution from oil, grease, fuel spills, and other materials due to the operation of construction machinery, safety and traffic management, avoidance of inconveniences to the public, air, and noise pollution control. It shall also include guidance on the proper design of the construction zone, careful management of stockpiles, vegetation, topsoil, and vehicles and machinery. The agreed CEMP will be the basis for monitoring by CPMU, RBO and other monitoring parties. The CEMP will allow construction supervision engineer to focus on what are specific items expected from the contractor regarding environmental safeguards on a day-to-day basis.

194. **Unanticipated Environmental Impacts.** Where unanticipated environmental impacts become apparent during project implementation, the RBO shall prepare a supplementary environmental assessment and EMP to assess the potential impacts and outline mitigation measures and resources to address those impacts.

Table 14: Environmental Management Plan

Impact	Activities	Mitigating measures	Implementer	Supervisor
Pre-Construction				
Design (DED)	Finalization of DED	Update the IEE and EMP, in case major change in the DED	RBO/IA	PMU/PMO
Construction EMP (CEMP)	CEMP (including Sediment Management Plan)	<ol style="list-style-type: none"> 1. Assign environmental officer and/or EHS officer at the site 2. Prepare construction EMP (including a spoil management plan/ sediment management plan as part of the contractor's EMP' for sites requiring dredging 	Contractor	PMU/PMO
Risk of unexploded object (UXO)		<ol style="list-style-type: none"> 1. Conduct site investigation and consult local authority and community 2. Offsite area such as borrow pits or disposal sites can have UXO risks. 	Contractor	PMU/PMO
Administrative issue (Permit and Approval)	Bidding and contracting	<ol style="list-style-type: none"> 1. Comply with all statutory requirements set out by Government; 2. Confirm Government approval and secure requisite permits etc. 3. PMUs ensure the EMP be included in bidding docs thus in contracts. 4. The bidding documents shall include a lump sum bid item in the bill of quantities to be titled "Environmental Mitigation Measures" that the environmental mitigating measures identified in the Environmental Code of Practice (ECOP) and EMP. 	Contractor	PMU/PMO
Encroachment of protected areas, areas for equipment, site offices, and storage areas	Select suitable Quarry, borrow pits and disposal sites	<ol style="list-style-type: none"> 1. Quarry, borrow pits and disposal sites, areas for equipment, site offices, and storage areas selection criteria considering both technical and environmental aspects: 2. Select locations of quarry site/s (for loose material other than stones) as included in the design specifications and on plan drawings to avoid disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution. 3. Local Mineral Resources and Energy Agency (Dinas Pertambangan dan Energi) approved sites would be selected first. 4. If other sites are necessary, these would to be located away from population centers, drinking water intakes and streams, cultivable lands, and natural drainage system, and in structurally stable areas even if some distance from construction activities 	Contractor	PMU/PMO

Impact	Activities	Mitigating measures	Implementer	Supervisor
		<ol style="list-style-type: none"> 5. If additional quarries will be required after construction is started, then the construction contractor shall use the mentioned criteria to select new quarry sites 6. Located beyond of right-of-way/demarcation of riparian zone: at least 5 (five) meters from the foot of river with embankment; at least 100 (one hundred) meters from the riverbank of large river without embankment; at least 50 (fifty) meters from the riverbank for tributary without embankment outside of settlement area 7. Alternatively, outsource of quarry, borrows pits and disposal with competent and certified third parties 		
Site selection of supporting facilities	Site selection of construction work camps and other supporting facilities.	<ol style="list-style-type: none"> 1. Avoid location which promote instability and result in destruction of property, vegetation, and public facilities. 2. Avoid thickly populated residential areas for setting up camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). 3. Extreme care will be taken to avoid disposals to the forest, water bodies or in areas which will inconvenience the community. 	Contractor	PMU/PMO
Construction				
Air Pollution: Dust	Earthworks and movement of vehicles can pose nuisance to nearby communities	<ol style="list-style-type: none"> 1. Require the contractor to cover materials with tarpaulin or other suitable materials while in transit to avoid spillage of materials. 2. Moisten earthen roads during dry and dusty conditions, particularly roads near residences and through the town core area. 3. Impose speed limits on construction vehicles. 4. Conduct regular maintenance on construction equipment and vehicles to control air emissions during vehicle operation. 5. Sites of borrow pits and spoil disposal must be at least 300 m from residential areas so as to reduce dust from these sites. 6. Effective dust suppression measures will be implemented near sensitive receptors such as schools, hospitals, or housing. 	Contractor	PMU/PMO
Nuisance Noise: Affect workers and community health	Operation of construction equipment will cause excessive noise	<ol style="list-style-type: none"> 1. Limit construction activities, particularly operation of noise generating equipment at night. 2. Position any stationary equipment that produces high noise levels such as diesel generators as far as practical from sensitive receptors. 	Contractor	PMU/PMO

Impact	Activities	Mitigating measures	Implementer	Supervisor
		<ol style="list-style-type: none"> 3. Erect temporary barriers around construction sites especially near schools, hospitals, and houses. 4. Install noise suppression devices to noise generating equipment. 5. Require drivers to minimize blowing of horn and to comply with speed limits. 6. Provide information to community on schedule of construction activities through billboard/signs. 7. Set appropriate working time limitations as refers to domestic regulations and IFC/WB EHS guidelines and consultation with the affected community 		
Water Quality	From camp and digging	<ol style="list-style-type: none"> 1. Construct silt traps, deviation channels, mounting barriers or trenches around the stockpiles of materials. 2. Provide adequate water supply and temporary toilet facilities at the worker's camp. 3. Cooperate with local cleansing agency or private sector for the desludging of temporary toilets and dispose the sludge 	Contractor	PMU/PMO
	Maintenance Dredging	<ol style="list-style-type: none"> 1. Prepare Sediment Management Plan as part of the CEMP for the sites requiring dredging 2. Apply Seasonal restrictions (or Environmental Windows) on dredging operations and should be determined in the early stages of the assessment by consultation 3. Schedule the dredging work during dry season 	Contractor	PMU/PMO
Soil Erosion/Contamination	Earth moving work Loss of valuable topsoil	<ol style="list-style-type: none"> 1. Cutting of trees will be undertaken as per approved design and only upon approval of relevant authorities. 2. Avoid cutting trees as much as possible and minimize damage to native vegetation. 3. Implement landscaping and planting of trees/vegetation at sites of the proposed facilities. 4. Soil erosion management plan to be prepared by the contractor and to be approved by the responsible authority before construction starts. 5. Maintain slope stability at cut faces by implementing erosion protection measures. 6. Construction in erosion and flood-prone areas should be mainly restricted to the dry season. 7. Control silt runoff and cover soil stockpiles; 8. Locate temporary soil stockpiles in areas where runoff will not induce sedimentation of waterways. 9. Establish protection measures for river embankment works, cut slopes, material stockpiles and other areas at risk of soil erosion prior to periods of heavy rainfall 	Contractor	PMU/PMO

Impact	Activities	Mitigating measures	Implementer	Supervisor
Construction debris and spoil;	Solid wastes, inert construction wastes, and hazardous wastes during construction	<ol style="list-style-type: none"> 1. Surplus excavated material/cut soil will be used as backfill material for low-lying areas that have been identified by the village authority. 2. Provide appropriate segregation bins or areas for construction wastes. 3. Secure and control storage of all hazardous materials including fuels. 4. Reuse recyclable construction wastes such as wood, steel, and scaffoldings or sell to junk shops. 5. Solid waste to be collected and disposed in approved disposal site of the districts. 6. The contractors will prohibit activities such as cutting wood for cooking, hunting, or wildlife trade. 	Contractor	PMU/PMO
Clearing of Vegetation	Poor planning and execution of tree clearing vegetation removal a loss of vegetation	<ol style="list-style-type: none"> 1. Prior to tree felling, ensure onsite inspections of trees will be conducted, by a suitably qualified expert, to ensure no nests are present. Any requirements for nest removal will be conducted by relevant agencies, or NGOs, and any actions recorded/ reported 2. Cutting of trees will be undertaken as per approved design and only upon approval of relevant authorities. Avoid cutting trees as much as possible and minimize damage to native vegetation. 3. Roads and paths will only be sufficiently wide to accommodate construction vehicles/equipment to minimize land take. 4. Manual labor will be utilized in sloping terrain where use of heavy equipment would cause unnecessary damage. Steep exposed slopes will be graded and covered with bush and grass to minimize erosion. 5. Implement landscaping and planting of trees/vegetation at sites of the proposed facilities. 6. Consider the need for the development of a tree planting schedule to strengthen and rehabilitate areas that have been impacted by construction activities (i.e., riparian zone) 7. Select the most suitable species (for example, under NBS the project propose vetiver species) to maintain bank stability once the riparian zone and associated vegetation has been stripped 	Contractor	Supervision (resident) Engineers
Social disturbance	Community access to areas, schools, religious buildings, village offices, market affected	<ol style="list-style-type: none"> 1. Walking access will be maintained to affected properties and access routes will be temporarily lined with timber or similar material. Particular attention will be given to ensuring safety along roads and paths used by pedestrians. 2. Install barriers and safety warning signs on road sections and if necessary, deploy traffic aides/ flag persons at affected locations. Information boards at blocked roads will provide information about the 	Contractor	Supervision (resident) Engineers

Impact	Activities	Mitigating measures	Implementer	Supervisor
		<p>temporary closure of roads, schedule of works and the traffic-rerouting plan.</p> <ol style="list-style-type: none"> Require the contractor to immediately rehabilitate the excavated areas and any damaged road and path sections. Enclose construction site perimeters so that pathway use, and access remains unimpeded. 		
Damage Physical Cultural resources (PCR)	Uncover relics and artifacts during civil works.	<ol style="list-style-type: none"> Chance-find procedure: in the event of accidental finds relics, should immediately cease any works in the area and protect the site Promptly report the find to their supervisor who immediately report local authority for PCR, e.g., cultural relic bureau. Contractor will ensure that the workforce is briefed on this procedure during prior training on EMP/ECC. 	Contractor	Supervision (resident) Engineers
Community Health & Safety	open excavation etc	<ol style="list-style-type: none"> Install barricades/barriers and sturdy plate covers in open excavations during non-working time. Install warning signs in the area before works commencement. Conduct consultation and dialogue to and update local community members of possible disruption due to construction activities Details of works that will disrupt access should be placed as signs. 	Contractor	Supervision (resident) Engineers
Increased Volume of Traffic	Increased traffic volumes and higher speeds may lead to accidents	<ol style="list-style-type: none"> Prepare a traffic control and management plan together with the local traffic police prior to any construction. The plan shall include provisions for diverting or scheduling construction traffic to avoid morning and afternoon peak traffic hours, regulating traffic at road crossings with an emphasis on ensuring public safety through clear signs, controls and planning. In case of lane closures, deploy workers to direct traffic. Signage and other appropriate safety features will be installed to indicate construction works are being undertaken Speed limits shall be established in the work sites to minimize the risk of accidents. 	Contractor	Supervision (resident) Engineers
Sanitation	Workers camps	<ol style="list-style-type: none"> Provide Sanitation Facilities One toilet, one tap / basin, one toilet for every 6 people, Fresh cold running water Convenient location to accommodation; Provision of soap, Ventilation to open air Separate facilities for men and women, Clean and hygienic Septic tank/sewage treatment facility, or pit latrines located at least 200m from surface waters, and in areas of suitable soil profiles and above the groundwater levels Separate area for sick workers to prevent transmission of disease 	Contractor	Supervision (resident) Engineers

Impact	Activities	Mitigating measures	Implementer	Supervisor
		<p>7. Detail on the sanitation of the workers camps and other requirements refers to IFC / EBRD guidelines</p> <p>https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_gpn_workersaccommodation)</p>		
Occupational Health and Safety	may pose hazards to workers because of the use of heavy equipment, lifting of heavy loads, and exposure to open excavations and chemicals.	<ol style="list-style-type: none"> 1. Require the contractor to implement the construction health and safety plan in accordance with the World Bank EHS Guidelines (http://www.ifc.org/ehsguidelines) as a minimum standard. The contractor will appoint an environment, health and safety officer to ensure implementation of the plan. The plan will at minimum include: <ol style="list-style-type: none"> 2. Provision of first-aid facilities readily accessible by workers. 3. Provision of personal protective equipment (PPEs) such as hard hats, gloves, and rubber boots. 4. Provide PPE for working near water bodies and a safety plan to ensure construction workers are trained on the dangers and risks of working near water bodies 5. Wearing of PPEs while working onsite will be a mandatory requirement for workers. 6. Posting of safety signs/reminders in strategic areas within the construction area. 7. Installation of sufficient lighting at night. 8. Ensure that vehicle and equipment operators are properly licensed and trained. 9. Provide staff with COVID 19, communicable disease and HIV-related awareness training. 10. The contractor will be required to provide priority hiring of qualified construction workers from the villages and to consult with the local authorities to avoid conflict if migrant workers brought in. 	Contractor	Supervision (resident) Engineers
	Construction site working conditions	<ol style="list-style-type: none"> 1. Form a joint team to plan and organize commencement and/or return to work 2. Develop or convene a joint occupational safety and health committee with members representing the employer and workers 3. Train team members on the basic principles for the formulation and implementation of occupational safety and health preventive and control measures. 4. Ensure preventative measures are in place before resuming or beginning construction work 	Contractor	Supervision (resident) Engineers

Impact	Activities	Mitigating measures	Implementer	Supervisor
		<ol style="list-style-type: none"> 5. Adopt engineering, organizational and administrative measures 6. Promote personal hygiene 7. Provide personal protective equipment (PPE) and inform workers of its correct use 8. Identify appropriate PPE related to the tasks and health and safety risks faced by workers according to the results of risk assessment and the level of risk, and provide it to workers free of charge and in sufficient number, along with instructions, procedures, training and supervision 9. Non-medical face-coverings (such as homemade cloth masks) should be worn as mitigation for catching and transmitting the virus, but are not to be treated as substitutes for proper hand washing 10. Health surveillance and insurance 11. Before entering the site, staff and visitors must confirm that they are not currently exhibiting flu-like symptoms 12. Monitor the health status of workers, develop protocols for cases of suspected and confirmed COVID-19. The protocol will state that: 13. Promote a safe and healthy working environment free from violence and harassment. 14. Encourage health promotion and wellbeing in the workplace through enough rest, balance of physical and mental activity and adequate work life balance 15. Implement prevention and control measures for the use and storage of chemicals, particularly those used for disinfection during COVID-19 16. Review emergency preparedness plans 		
Operation and Maintenance				
Flood Risk	Reduction of Flood Risk	<ol style="list-style-type: none"> 1. Perform regular inspections of levees and flood control buildings 2. Maintaining river channel, riverbank, and riparian zones 3. Carry out regular inspections and supervision along the river channel 4. Perform regular dredging to maintain the dimensions of the river trough 5. Maintaining the stability of the riverbank 6. Cooperate with authorized institutions in controlling development plans and activities in floodplains 7. Prepare flood risk management plans and emergency response for the detention basins 	Balai (RBO)	DGWR
Soil and Sediment	Erosion and sedimentation	<ol style="list-style-type: none"> 1. Undertake dredging and works on river channels and banks during the dry season when river levels are at a minimum 	Balai (RBO)	DGWR

Impact	Activities	Mitigating measures	Implementer	Supervisor
		2. Use dredging methods that minimize sediment suspension such as cutter suction dredge, use of silt curtains 3. sites for disposal areas shall not promote instability and result in the destruction of property, disturbance to vegetation and fauna (biodiversity) and public facilities (see Pre-Construction Measures) 4. Minimizing the area of vegetation clearing and land disturbance at any one time 5. Stabilising and revegetate disturbed areas as soon as possible 6. Undertaking and completing works in smaller sections in order to minimise the time for which disturbed areas are left exposed. 7. Monitoring work areas and changing work methods if sediment is entering river or sediment plumes are observed in river. 8. Carrying out earthworks during dry weather. 9. Carrying out soil erosion and sediment control measures in accordance with good construction practices.		

Source: Ministry of Public Works and Public Housing.

B. Environmental Monitoring Plan

195. Table 15 presents the information on: (i) aspects or parameter to be monitored; (ii) location where monitoring is applicable; (iii) means of monitoring; (iv) frequency of monitoring; (v) responsibility of compliance monitoring; and (vi) cost of monitoring.

196. The RBO Environment Officer shall provide the CPMU with its monthly environmental monitoring reports. The CPMU shall consolidate all monthly environmental monitoring reports of all subprojects and prepare a monthly and quarterly environmental monitoring report. Using the quarterly reports, the CPMU shall prepare the semi-annual environmental safeguards progress report which shall be submitted to ADB and detailing the status of mitigating measures implementation. The Environmental Monitoring Plan is presented in Table 15. Roles of the CPMU and the PIU are outlined in the succeeding section for institutional arrangement.

Table 15: Environmental Monitoring Plan

Aspects/Parameters	Indicators	Location	Means of Monitoring	Frequency	Responsibility	Supervision	Cost
Water quality (with key standard parameters)	pH, BOD, COD, TSS, E-Coli (Key parameters of Water Quality for Irrigation Water- Gov Regulation No. 22/2021)	At river (or canals) and/or water body likely polluted by the project	Visual observation and by laboratory when there is complaints, dispute or deemed necessary by PMU and its experts	As required in AMDAL document	Contractor	PMU/ PIU	Included in construction cost
Erosion and sedimentation	Heavy metals in the sediment (Gov	At the location of	Visual inspection of	Daily	Contractor	Construction supervision	Part of consultant's

Aspects/ Parameters	Indicators	Location	Means of Monitoring	Frequency	Responsibility	Supervision	Cost
	Regulation No. 22/2021)	earth work and excavation	sites			consultants, PMU/ PIU	construction supervision
Dust, cover of stockpiles	Dust, SO ₂ , NO ₂ , and others (Gov Regulation No. 22/2021)	At the location of stockpiles	Visual inspection of sites	Daily	Contractor	Construction supervision consultants, PMU/ PIU	Part of consultant's construction supervision
Noise levels not to exceed 55 dB(A) near schools and residential areas;	Noise Level (Decree of MOE No. KEP-48/MENLH/11/1996)	At the construction site and nearby areas	Use of sound meter	Daily	Contractor	Construction supervision consultants, PMU/ PIU	Same as above
Accident and incident related to hazard condition and hazard actions to occupational health and safety	<ul style="list-style-type: none"> • Fatality Rate • Near miss Rate • PPE, Signs/Warnings 	Project area and associated area (road and workshop) and nearby areas (public areas)	Observation, documentation and reporting	Routinely	Contractor	PMU/ PIU	Included in construction cost
Solid and hazardous wastes	Volume of wastes and/or spill (if any)	construction site and nearby areas	Visual inspection of sites	Daily	Contractor	Construction supervision consultants, PMU/ PIU	Part of consultant's construction supervision
Flora and fauna	Number of trees cut and fauna disturbed (if any)	construction site and nearby areas	Visual inspection of sites	Daily	Contractor	Construction supervision consultants, PMU/ PIU	Part of consultant's construction supervision

Source: TRTA Consultants.

197. **Environmental Monitoring Cost.** Monitoring cost for pre-construction is minimal cost to CPMU since this is simply verification by the CPMU on whether the EMP is included in tender and contract documents. Construction monitoring cost is minimal cost to PIU since it will be their personnel who will do checking/inspections of the construction activities and its part of their operational costs. Monitoring cost of construction supervision consultants are also minimal costs since this is a form of checking/inspections cost and part of their contracts. The cost to PMU for the GRM is also minimal cost since these are only meetings for resolving the complaints and it is included in the contractor's contract.

198. **Project Performance Monitoring.** Project performance monitoring presents the desired outcomes as measurable events by providing parameters or aspects that can be monitored and verified (Table 16). Tendering process advocating environmentally responsible procurement is a desired outcome during the pre-construction phase. This can easily be verified by checking if EMP requirements are incorporated in construction contracts. Construction phase desired outcomes include effective management of environmental impacts and reduce risk to public.

Table 16: Project Performance Monitoring

Desired Outcomes	Aspects / Parameters to be monitored	Means of Monitoring	Monitoring Frequency	Implementation	Compliance Monitoring	Monitoring Cost
PRE-CONSTRUCTION PHASE						
Detailed design is environmentally responsive	EMP requirements incorporated in detailed design	Verify detailed design documents	Two reviews: (i) draft detailed design documents and (ii) prior to approval of final documents	Design consultants/ PPIU	CPMU	Part of project management in detailed design (minimal cost)
Tendering process advocates environmentally responsible procurement	EMP requirements incorporated in construction contracts	Verify construction contract documents	Prior to finalization of construction contract documents	Design consultants/ PPIU	CPMU	Part of project management in tendering (minimal cost)
CONSTRUCTION PHASE						
Effective management of environmental impacts during construction	Number of public complaints on construction activities	Verification of contractor's records; PIU/ PMU's coordination with local officials	Once a month	Contractor	Construction supervision consultants, CPMU/ PPIU	Part of consultant's construction supervision contract; minimal cost to CPMU/PIU
Reduce risk to workers and the public during construction	Number of accidents involving construction activities	Verification of contractor's records; PIU/ PMU's coordination with local officials	Once a month	Contractor	Construction supervision consultants, CPMU/ PIU	Part of consultant's construction supervision contract; minimal cost to CPMU/ PIU
Post CONSTRUCTION PHASE						
(Not applicable – Monitoring during project phase only)						

Source: Ministry of Public Works and Public Housing.

X. IMPLEMENTATION ARRANGEMENT

199. **Institutional Setup.** The DGWR is the Executing Agency responsible for overall subproject including environment, while the subproject implementation unit (PIU) is the Cimanuk Cisanggarung River Basin Organization (RBO) which will establish a PIU headed by a manager (PIU head) with experience in the externally financed subproject. PIU will be responsible for the day-to-day implementation of the Subproject and will be accountable for technical, safeguards and financial reporting. A summary of the implementation organizations and corresponding management roles and responsibilities are documented below (Table 17).

Table 17: Role and Responsibilities of Project Stakeholders

Project Implementation Organizations	Management Roles and Responsibilities
National Steering Committee Ministry of National Development Planning/ BAPPENAS Ministry of Public Works and Housing	<ul style="list-style-type: none"> Oversee progress and provide guidance on the project implementation Monitor and evaluate the overall project performance and outcomes Review and endorse annual work plans

Project Implementation Organizations	Management Roles and Responsibilities
<p>Executing Agency Ministry of Public Works and Housing through the Directorate General of Water Resources</p>	<ul style="list-style-type: none"> • Overall responsible for implementation of subprojects • Will establish a Central Project Management Unit (CPMU) within the Directorate General of Water Resources (DGWR) to consolidate activities and reporting from Project Management Units (PMUs) and Project Implementing Units (PIUs) • Supported by a secretariat consisting of representatives of concerned Directorates. The CPMU secretariat will be headed by the Director of System and Strategy for Water Resources Management (DSSWRM), DGWR and staffed with financial management, monitoring and reporting, procurement, social and environmental safeguards, gender, and technical personnel. • Ensure that loan covenants are complied with • Maintain project accounts, monitor financial and physical progress, and report such progress to ADB • Prepare withdrawal applications (WA) including retention of supporting documents and submit the Was (through MOF) to ADB. • Lead and coordinate activities related to financial management and financial audit • Consolidate quarterly and annual reports, including safeguards and audited annual project financial statements and submit to ADB.
<p>Project Management Units Directorate General of Water Resources</p>	<ul style="list-style-type: none"> • Establish PMUs headed by a project director and staffed with social and environmental safeguards, gender, procurement, financial management and technical personnel • Provide quarterly and annual reports including audited annual financial statements as required under the loan agreement • Provide operational support for project activities • Coordinate with the government and partner agencies for successful implementation of the project • Prepare annual contract awards and disbursement projections, requesting budgetary allocations for counterpart funds;
<p>Project Implementing Units</p> <p><u>Output 1:</u> - Directorate of Technical Guidance; Directorate of Operation and Maintenance; River Basin Organizations (RBOs); DGWR - Ministry of Home Affairs - Indonesia Space Agency (LAPAN)</p> <p><u>Output 3:</u> Directorate of River and Coastal; RBOs; DGWR</p>	<ul style="list-style-type: none"> • Establish PIUs headed by a project director and staffed with social and environmental safeguards, gender, procurement, financial management and technical personnel • Responsible for implementation of all subprojects under each implementing agency's purview • Recruit design and supervision consultant for all subprojects under its purview • Prepare safeguards planning documents, implement environmental and social safeguards plans, and monitor safeguards-related activities for ADB and government requirements. • Undertake day-to-day implementation activities • Supervise design, supervision and management consultants • Manage the procurement process (prepare bidding documents, manage bidding process, submit required documents to ADB for required clearances) in coordination with Regional Procurement Agencies • Implement procurement, safeguards activities and gender action plan • Manage financial management including prepare budget, annual projections, process invoices and withdrawal applications, etc.
<p>Ministry of Finance</p>	<ul style="list-style-type: none"> • Establishment of advance account on behalf of the executing agency. • Allocation and timely release of counterpart funds • Authorize withdrawal application submitted by the executing agency. • Communicate with ADB for any amendments in the reallocation of the loan amount. • Administer advance account
<p>Regional Procurement Agencies (MPWH)</p>	<ul style="list-style-type: none"> • Conduct procurement for packages under the CPMU and PIU authorities
<p>Provincial and Local governments</p>	<ul style="list-style-type: none"> • Facilitate land clearance

Project Implementation Organizations	Management Roles and Responsibilities
	<ul style="list-style-type: none"> • Ensure issuing of relevant permits • Integration of activities
Asian Development Bank	<ul style="list-style-type: none"> • Undertake regular project reviews and facilitate implementation of the project, including compliance by the executing agency and implementation agencies to obligations and responsibilities
Project Implementation Organizations	Management Roles and Responsibilities
National Steering Committee Ministry of National Development Planning/ BAPPENAS Ministry of Public Works and Housing	<ul style="list-style-type: none"> • Oversee progress and provide guidance on the project implementation • Monitor and evaluate the overall project performance and outcomes • Review and endorse annual work plans
Executing Agency Ministry of Public Works and Housing through the Directorate General of Water Resources	<ul style="list-style-type: none"> • Overall responsible for implementation of subprojects • Will establish a Central Project Management Unit (CPMU) within the Directorate General of Water Resources (DGWR) to consolidate activities and reporting from Project Management Units (PMUs) and Project Implementing Units (PIUs) • Supported by a secretariat consisting of representatives of concerned Directorates. The CPMU secretariat will be headed by the Director of System and Strategy for Water Resources Management (DSSWRM), DGWR and staffed with financial management, monitoring and reporting, procurement, social and environmental safeguards, gender, and technical personnel. • Ensure that loan covenants are complied with • Maintain project accounts, monitor financial and physical progress, and report such progress to ADB • Prepare withdrawal applications (WA) including retention of supporting documents and submit the Was (through MOF) to ADB. • Lead and coordinate activities related to financial management and financial audit • Consolidate quarterly and annual reports, including safeguards and audited annual project financial statements and submit to ADB.
Project Management Units Directorate General of Water Resources	<ul style="list-style-type: none"> • Establish PMUs headed by a project director and staffed with social and environmental safeguards, gender, procurement, financial management and technical personnel • Provide quarterly and annual reports including audited annual financial statements as required under the loan agreement • Provide operational support for project activities • Coordinate with the government and partner agencies for successful implementation of the project • Prepare annual contract awards and disbursement projections, requesting budgetary allocations for counterpart funds;
Project Implementing Units <u>Output 1:</u> - Directorate of Technical Guidance; Directorate of Operation and Maintenance; River Basin Organizations (RBOs); DGWR - Ministry of Home Affairs - Indonesia Space Agency (LAPAN) <u>Output 3:</u> Directorate of River and Coastal; RBOs; DGWR	<ul style="list-style-type: none"> • Establish PIUs headed by a project director and staffed with social and environmental safeguards, gender, procurement, financial management and technical personnel • Responsible for implementation of all subprojects under each implementing agency's purview • Recruit design and supervision consultant for all subprojects under its purview • Prepare safeguards planning documents, implement environmental and social safeguards plans, and monitor safeguards-related activities for ADB and government requirements. • Undertake day-to-day implementation activities • Supervise design, supervision and management consultants • Manage the procurement process (prepare bidding documents, manage bidding process, submit required documents to ADB for required clearances) in coordination with Regional Procurement Agencies • Implement procurement, safeguards activities and gender action plan

Project Implementation Organizations	Management Roles and Responsibilities
	<ul style="list-style-type: none"> • Manage financial management including prepare budget, annual projections, process invoices and withdrawal applications, etc.
Ministry of Finance	<ul style="list-style-type: none"> • Establishment of advance account on behalf of the executing agency. • Allocation and timely release of counterpart funds • Authorize withdrawal application submitted by the executing agency. • Communicate with ADB for any amendments in the reallocation of the loan amount. • Administer advance account
Regional Procurement Agencies (MPWH)	<ul style="list-style-type: none"> • Conduct procurement for packages under the CPMU and PIU authorities
Provincial and Local governments	<ul style="list-style-type: none"> • Facilitate land clearance • Ensure issuing of relevant permits • Integration of activities
Asian Development Bank	<ul style="list-style-type: none"> • Undertake regular project reviews and facilitate implementation of the project, including compliance by the executing agency and implementation agencies to obligations and responsibilities

Source: Ministry of Public Works and Public Housing.

200. **At the National Level** the DGWR with Directorate of WRM System and Strategy (SSPSDA) will function as Central Project Management Unit (CPMU), supported by the Ministry of Finance, that will provide technical advice and coordination to the provincial and district Bappeda planning agencies. The CPMU will appoint a designated environmental safeguard consultant to ensure the principle of environmental safeguard in the project, from planning to implementation.

201. The CPMU shall appoint a staff acted as Environment Officer for FMNJP, to oversee the implementation and monitoring of environmental safeguards requirements. With assistance from the Environmental Specialists of the PPC team, the PMC shall be responsible for the following activities related to environmental safeguards: (i) confirm that the IEEs are updated in accordance with ADB's SPS based on detailed designs and submit to ADB for review and approval prior to contract award; (ii) confirm that the required AMDAL, a GOI requirement, has been prepared during detailed design and approved by the respective environment agency, the Ministry of Environment and Forestry; (iii) confirm that the EMP is included in the bidding documents and civil works contracts; (iv) ensure Construction's EMPs (CEMPs) are prepared by contractors prior to actual construction; (v) establish a system to monitor environmental safeguards of the subprojects including monitoring the indicators set out in the monitoring plan of the EMP; (vi) supervise the implementation of environmental mitigating measures required for the construction activities; (vii) review, monitor and evaluate the effectiveness of the implemented CEMPs, and recommend necessary corrective actions; (viii) prepare monthly and quarterly environmental monitoring reports and submit semi-annual environmental monitoring report to ADB; (ix) ensure timely disclosure of final IEE and EMP in locations and form accessible to the public, and (x) address, record, and report on any grievances brought about through the Grievance Redress Mechanism (GRM) in a timely manner.

202. The executing and implementing agencies are required to retain adequate staff and consultants with relevant qualifications and experience, to be able to adequately design and deliver the environmental safeguards plans for the subproject. They remain responsible for reviewing and if necessary updating the environmental safeguards plans at the time of each scheduled bi-annual report, particularly with regards to potential changes in subproject scope, location, timing, that might require additional resources.

203. **At the Regional level**, The RBO will collaborate with both national level agency and regional agency stakeholders. In addition to coordinating with the DGWR and the Directorate of

River and Coast, the RBO authorities shall also work closely with local governments, and the key regional technical agencies (Water Resources/Irrigation, Bappeda, Agriculture, Environment and Forestry), both provincial and district level. The RBO shall also appoint an environmental safeguard focal person to ensure the application of safeguard principles and processes (from planning to preparatory and implementation stage), as per ADB and national standards. The environmental safeguard focal person must have a good understanding of ADB SPS 2009 and related GOI regulations regarding environmental regulations.

204. The following are the role of environmental safeguard focal person that will be appointed at the RBO level:

- (i) Work in coordination with contractor for the day-to-day implementation and monitoring of safeguards plans, including implementation of IEE activities; and
- (ii) Supporting the functioning of the GRM. The environmental safeguard staff will be a member of the Grievance Redress Committee.

205. **Provincial Government.** The Central Java and West Provincial Government will be responsible to address complaints and objections (grievances).

206. **District/City Local Government.** District governments will play an important role at the site level, including implementing IEE to ensure that the subproject is in line with the *Rencana Tata Ruang dan Wilayah* (spatial plan) (RTRW).

207. **Subdistrict and village governments** and their leaders will be directly involved in facilitating, planning, preparing, and implementing the IEE activities.

208. At the bottom of this institutional setup are the contractors which are responsible for implementing the required environmental mitigation measures as defined by their respective approved CEMP. Close coordination between the contractors and the Environment Officer of PIU is needed to ensure good planning for mitigation measures and ensure the timely implementation. The contractors are also directly involved in addressing grievances during the construction period since their activities will cause disturbances to the public. Oftentimes, complaints can easily be resolved between the contractors and the complainants. The contractor's highest official at the site such as the Construction Manager or Construction Superintendent shall be a member of the Environmental Compliance Committee (ECC).

209. External environmental monitoring will be done by Dinas Lingkungan Hidup (DLH) as required by its mandate. DLH is tasked to prepare and implement regional policies and rules to promote environmental protection and conservation. It reports to the Regent through the Regional Secretary. Its function is to: (a) formulate and recommend policies on environmental management and (b) prepare and carry out work plans and programs on environmental management and monitoring and AMDAL (Indonesia EIA system). It is their responsibility for enforcing the AMDAL system. It is also involved in monitoring the water quality of rivers in respective districts and province.

210. **Implementation Schedule.** As presented in the project description, construction of the subproject is scheduled to start in 2021, CPMU shall ensure that construction contract provisions related to the contractor's EMP shall be included in the tendering stage.

211. **GOI Approval/Permits.** Under GOI's Environmental Regulation (No. 22/2021)²⁸, the RBO shall apply for AMDAL approval from the Ministry of Environment and Forestry.

212. **Capacity Building.** The project will recruit consulting services for (i) project management advisory services, including detailed engineering designs, preparation of contract documents, support to PIUs on construction supervision and quality control; and (ii) institutional development and capacity building. During the pre-construction and construction period, it shall be necessary to provide an Environmental Advisor to the CPMU.

XI. CONCLUSION AND RECOMMENDATION

213. Based on the screening for potential environmental impacts and risks of the proposed subproject, there are no significant negative environmental impacts and risks that cannot be mitigated. With the EMP, the proposed subproject can be implemented in an environmentally acceptable manner. There is no need for further environmental assessment study. A full EIA is not warranted and the subproject's environmental classification as Category B is deemed appropriate.

²⁸ Recently GR No. 27/2012 has been diluted into GR No. 22/2021 on Implementation of Environmental Protection and Management, as mandated in Law No. 11/2020 on Job Creation.

Appendix 1. Rapid Environmental Assessment (REA) Checklist for Cisanggarung River

Table 1: Rapid Environmental Assessment (REA) Checklist

<p>Instructions:</p> <p>(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.</p> <p>(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.</p> <p>(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.</p>
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Country/Project Title:

Indonesia: Flood Management in North Java (FMNJP)

Sector Division:

SEER

A. Flood Risk Management²⁹

Table 1: Rapid Environment Assessment (REA) Checklist

Screening Questions	Yes	No	Remarks
<p>A. Project Siting</p> <p>Is the Project area adjacent to or within any of the following environmentally sensitive areas?</p>			Subprojects located in or adjacent to environmentally sensitive areas will not be eligible. Screening and eligibility criteria will be defined in the Environmental Assessment and Review Framework (EARF).
<ul style="list-style-type: none"> ▪ Cultural heritage site 		X	
<ul style="list-style-type: none"> ▪ Protected Area 		X	Based on PIPPIB map and spatial plan (RTRW), project areas are not located in protected areas. This will be confirmed with respective DLH (Kabupaten Brebes)
<ul style="list-style-type: none"> ▪ Wetland 		X	
<ul style="list-style-type: none"> ▪ Mangrove 		X	
<ul style="list-style-type: none"> ▪ Estuarine 		X	
<ul style="list-style-type: none"> ▪ Buffer zone of protected area 		X	

²⁹ The template for "Ports and Harbors" is used to cover the impact of land transformation of water area, especially dredging.

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> ▪ Special area for protecting biodiversity 		X	
B. Potential Environmental Impacts Will the Project cause...			
<ul style="list-style-type: none"> ▪ encroachment on precious ecology resulting in loss or damage to fisheries and fragile coastal habitats such as coral reefs, mangroves, and seagrass beds? 		X	
<ul style="list-style-type: none"> ▪ short-term increase in turbidity and sunlight penetration as well as changes in sediment pattern and flows at dredging site? 		X	Avoidance or mitigation measures will be applied such as dredging in dry season, use of cutter suction dredge and/or turbidity curtains.
<ul style="list-style-type: none"> ▪ removal and disturbance of aquatic flora and fauna at dredging site? 	X		Dredging activities may impact both aquatic flora and fauna. Mitigation measures will be proposed and implemented in EMP
<ul style="list-style-type: none"> ▪ deterioration of water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction? 		X	Mitigation measures will be proposed and implemented in EMP for construction camp
<ul style="list-style-type: none"> ▪ alteration of bottom surface and modifications to bathymetry, causing changes in tidal bore, river circulation, species diversity, and salinity? 		X	Not applicable
<ul style="list-style-type: none"> ▪ changes in sediment pattern and littoral drift that may cause beach erosion of neighboring areas? 		X	Not applicable
<ul style="list-style-type: none"> ▪ modification of terrestrial habitat by upland disposal of dredged material or covering of potential archaeological sites with dredge spoil? 		X	Dredged sediment will preferably be placed on the adjacent levee banks or used for bank construction. Spoil locations if required will be selected away from habitats or archaeological sites
<ul style="list-style-type: none"> ▪ short-term air quality degradation due to dredging- related operations? 		X	Any emissions from equipment or fugitive dust associated with dry bulk materials will be minor and minimized by appropriate dust control, equipment exhausts and maintenance
<ul style="list-style-type: none"> ▪ noise and vibration due to blasting and other civil works? 		X	No blasting is expected
<ul style="list-style-type: none"> ▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation? 	X		Physical construction hazards will be consistent with construction projects and managed appropriately.
<ul style="list-style-type: none"> ▪ dislocation or involuntary resettlement of people? 		X	Will be studied under LARP
<ul style="list-style-type: none"> ▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups? 		X	

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> other social concerns relating to inconveniences in living conditions in the project areas? 	X		Access to the river will be restricted in works areas during construction. Design will incorporate access to river in consultation with local community.
<ul style="list-style-type: none"> social conflicts if construction depletes local fishery resources on which communities depend for subsistence? 		X	
<ul style="list-style-type: none"> poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations (such as STI's and HIV/AIDS)? 		X	Waste management in accordance with good practice. Communicable disease awareness training will be provided to workers.
<ul style="list-style-type: none"> social concerns relating to local inconveniences associated with port operation (e.g. increased volume of port traffic, greater risk of accidents, communicable disease transmission)? 		X	[NOT RELEVANT] Port is not part of the project.
<ul style="list-style-type: none"> deterioration of water quality due to ship (e.g. ballast water, oil waste, lubricant and fuel spills, sewage) and waterfront industry discharges? 		X	[NOT RELEVANT] Ships and waterfront industry not involved.
<ul style="list-style-type: none"> increased noise and air pollution resulting from airborne emissions (e.g. gas, smoke, fumes) from maneuvering and berthing ships and the waterfront industry? 		X	
<ul style="list-style-type: none"> large population increase during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? 		X	Large workforce not anticipated
<ul style="list-style-type: none"> social conflicts especially when workers from other areas are hired? 		X	Local workers will be prioritized, as they meet requirement.
<ul style="list-style-type: none"> risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation? 		X	Explosives not anticipated. Fuel and chemicals will be managed in accordance with good practice.
<ul style="list-style-type: none"> community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning? 		X	Access to the project sites will be restricted in works areas during construction. Design will incorporate access to river in consultation with local community. Safe access to public use areas will be provided during operation in consultation with local people.

Table 2: Preliminary Climate Risk Screening

Screening Questions		Score	Remarks ³⁰
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Siting of sediment trap will consider climate and weather-related disaster
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	1	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	1	The project needs to be designed to accommodate future climate change scenarios.
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	1	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered as low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned as medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): Medium

Other Comment

³⁰ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Appendix 2. List of Indonesia Regulations Related to Environmental Safeguard

No.	Legal Hierarchy	Laws and Regulations Referred
A	Constitution	1) UUD 1945 (Indonesia's Constitution)
B	TAP MPR	2) Article 5 TAP MPR (Decree of Supreme People Assembly) No. IX/MPR/2001 on Agrarian Reform and Natural Resource Management
C	Laws	1) Law No. 5/1960 on Basic Stipulation of Agrarian Regulation 2) Law 5/1990 on Conservation of Living Natural Resources and Ecosystems 3) Law 12/1992 on Cultivation of Plants 4) Law 7/994 on Ratification of Agreement Establishing the World Trade Organization 5) Law No. 5/1994 on Ratification of UN Convention on Biodiversity (UN-CBD) 6) Law No. 39/1999 on Human Right 7) Law No. 41/1999 on Forestry 8) Law 13/2003 on Labor 9) Law No. 31/2004 jo. UU No. 45/2009 on Fishery 10) Law 17/2004 on Ratification of the Kyoto Protocol to the United Nations Framework Convention on Climate Change 11) Law 24/2007 on Disaster Management 12) Law No. 26/2007 on Spatial Plan 13) Law 14/2008 on Disclosure of Public Information 14) Law 19/2009, Ratification of the Stockholm Convention on Persistent Organic Pollutants 15) Law 32/2009 on Environmental Protection and Management 16) Law 36 /2009 on Health 17) Law 11/2010 on Cultural Heritage 18) Law No. 11/2013 on Ratification of Nagoya Protocol on Access to Genetic Resources and Fair and Balanced Benefit Sharing of Its Utilization upon Biodiversity Convention 19) Law 18/2013 on Prevention and Eradication of Forest Destruction 20) Law 1/2014 (Amendment to Law of 27/2007 on the Management of Coastal Areas and Small Islands 21) Law No. 37/2014 on Soil and Water Conservation 22) Law No. 17/2019 on Water Resources 23) Law No. 11/2020 on Job Creation
D	Government Regulation	1) Government Regulation 102/2000 on National Standardization 2) Government Regulation (Minister of Agriculture) 1/2007 on Active Materials of Prohibited and Restricted Pesticides 3) Government Regulation 21/2008 on Disaster Management 4) Government Regulation 30/2009 on Implementation Procedures for Reducing Emissions from Deforestation and Forest Degradation (REDD) 5) Government Regulation 70/2009 on Energy Conservation 6) Government Regulation 1/2010 on Water Pollution Control System 7) Government Regulation 6/2010 on Norms, Standards, Procedures and Criteria for Forest Management in Protected Forest Management Units

No.	Legal Hierarchy	Laws and Regulations Referred
		8) Management and Monitoring Efforts and Statement of Capability to Manage and Monitor the Living Environment 9) Government Regulation 17/2012 on Guidelines for Community Involvement in the Process of Impact Assessment and Environmental Permitting 10) Government Regulation 145/2013 on Measuring, Reporting and Verifying Climate Change Mitigation Actions 11) Government Regulation No. 121/2015 on Commercialization of Water Resource 12) Government Regulation No. 24/2018 on OSS (Online Single Submission; Electronically Integrated Permitting Services) 13) Government Regulation No. 5/2021 on Implementation of Risk Based Commercial Business Permit 14) Government Regulation No. 22/2021 on Implementation of Environmental Protection and Management
E	Presidential Decrees and Regulations	1) Presidential Instruction 9/2000 Mainstreaming Gender in the Development Process 2) Presidential Decree 32/1990 on Management of Protected Areas 3) Presidential Decree 46/2001, Operation of the National Greenhouse Gas Inventory 4) Presidential Regulation 23/1992 on Ratification of the Vienna Convention for Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer as Adjusted and Amended by the Second Meeting of the Parties London, 27-29 June 1990 5) Presidential Decree 23/1992 on Ratification of the Montreal Protocol on Substances that Deplete the Ozone Layer 6) Presidential Decree 46/2005 Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer 7) Presidential Regulation Number 10 of 2011 on National Institution of Coordination of Agricultural, Fishery and Forestry Counseling. 8) Presidential Regulation 61/2011, on National Action Plan for Greenhouse Gas Emission Reduction
F	Ministerial Decrees	1) Minister of Labor Decree 5/1996 on Work Safety and Health Management System 2) Decree of the Head of Environmental Impact Management Agency 299/1996 on the Technical Direction of Social Assessment in EIA/AMDAL. 3) Decree of the Head of Environmental Impact Management Agency 124/1997 on the Public Health Assessment in EIA/AMDAL 4) Decree of Minister of Environmental Affairs 45/2005 on Guidelines for the Formulation of Reports on the Realization of Environmental Management Plans (RKL) and Environmental Monitoring Plans (RPL) 5) Minister of Public Works Decree 9/2008 on Management System for of Worker Safety and Health in the Construction of Public Works 6) Minister of Environment Decree 31/2009 on Direction and Control of implementation of Environmental Management, Ecolabelling, Clean Production, and Environmental Technology Use in Regions. 7) Minister of Environment Decree 9/2010 on Guidelines on Community Grievances and Handling of Grievances Caused by Pollution and/or Degradation

No.	Legal Hierarchy	Laws and Regulations Referred
		<p>8) Minister of Environment Decree Number 17 of 2012 on Public Participation in AMDAL and Environmental License</p> <p>9) Minister of Environment Decree Number 15 of 2013 on Measurement, Notification, and Verification of Mitigation Actions for Climate Change</p> <p>10) Minister of Environment Decree Number 03/2013 on Environmental Audit</p> <p>11) Decree 62/2013 on Managing Agency for the Reduction of Emissions from Deforestation and Degradation of Forests and Peat lands</p> <p>12) Special assessment for traffic generation and its impacts for settlements and infrastructure projects (Decree of Ministry of Transport No. PM 75/2015)</p> <p>13) Regulation of Ministry of Environment and Forestry No. P.31/MENLHK/SETJEN/SET.1/5/2017 on Guideline of Gender Mainstreaming in Environment and Forestry and Regulation of Ministry of Forestry No. P.65/Menhut-II/2011 on Guideline of Gender Responsive Planning and Budgeting in Forestry Sector</p> <p>14) Decree of Minister of Environment No. P.22/Menlhk/Setjen/Set.1/3/2017 on Procedure of Complaint on Pollution and/or Environmental Deterioration and/or Forest Destruction</p> <p>15) Ministerial Regulation of Environment and Forestry No. P.34/MENLHK/SETJEN/KUM.1/5/2017 on Acknowledgment and Protection of Local Wisdom in Natural Resource and Environmental Management</p> <p>16) Ministerial Regulation of Environment and Forestry No. P.36/MENLHK/SETJEN/KUM.1/6/2017 on Registration and Notification Procedure of Hazardous Materials</p> <p>17) Ministerial Regulation of Environment and Forestry No. 4/2021 on List of Business Plans and/or Activities Requiring AMDAL, UKL-UPL or SPPL</p>

Appendix 3. Ambient Air Quality and Noise Standard

Ambient Air Quality

Government Regulation No. 22/2021 on Implementation of Environmental Protection and Management

No	Parameter	Measurement Time	Quality Standard
1	SO ₂ (Sulphur Dioxide)	1-hour	150 µg/m ³
		24-hours	75 µg/m ³
		1-year	45 µg/m ³
2	CO (Carbon Monoxide)	1-hour	10,000 µg/m ³
		8-hours	4,000 µg/m ³
3	NO ₂ (Nitrogen Dioxide)	1-hour	200 µg/m ³
		24-hours	65 µg/m ³
		1-year	50 µg/m ³
4	O ₃ (Ozone)	1-hour	150 µg/m ³
		8-hours	100 µg/m ³
		1-year	35 µg/m ³
5	HC (Hydrocarbon)	3-hours	160 µg/m ³
6	TSP (Dust)	24-hours	230 µg/m ³
7	PM ₁₀ (Particle < 10 µm)	24-hours	75 µg/m ³
		1-year	40 µg/m ³
	PM _{2.5} (Particle < 2.5 µm)	24-hours	55 µg/m ³
		1-year	15 µg/m ³
8	Pb (Lead)	24-hours	2 µg/m ³

Parameters for Noise

Decree of State Minister of Environment No. KEP-48/MENLH/11/1996 on Noise Level Standard

No	Parameters	Standard (dB)
A.	Noise Level	
A.1	Area by Its Allocation	
1	Residential and Settlements	55
2	Commercial and Service	70
3	Office and Trade	65
4	Green Open Space	50
5	Industries	70
6	Government and Public Facilities	60
7	Recreation Area	70
8	Special Areas:	
	- Airport, Train Station, Port	70
	- Cultural Heritage	60
A.2	Surrounding of Activities	
1	Hospital or similar facilities	55
2	School or similar facilities	55
3	Worship or similar facilities	55

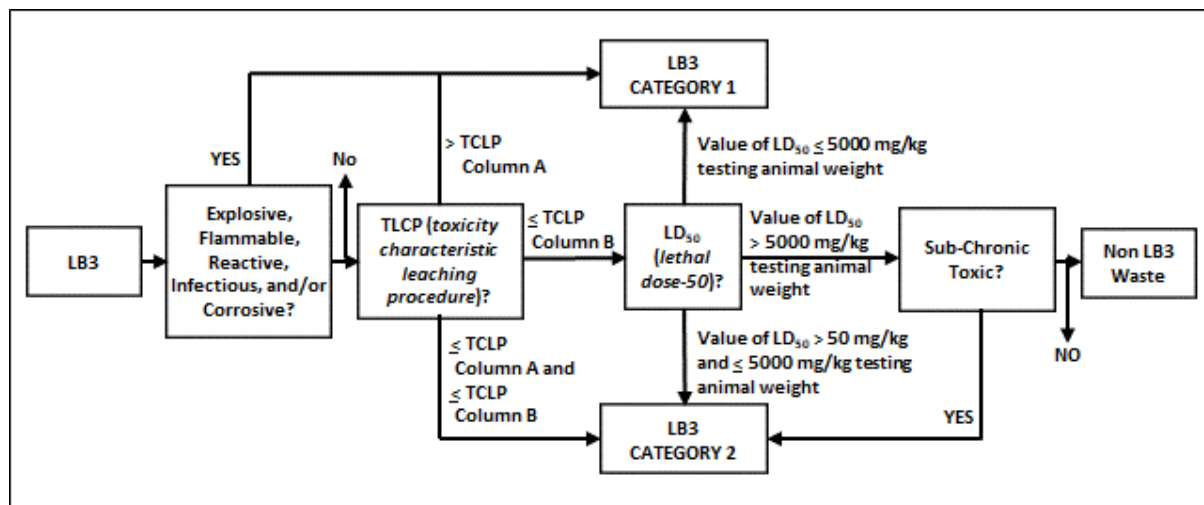
Appendix 4. Water Quality Standard

Government Regulation No. 22/2021 on Implementation of Environmental Protection and Management

PARAMETER	UNIT	CLASS				REMARKS
		I	II	III	IV	
Physical						
Temperature	0C	Deviation 3	Deviation 3	Deviation 3	Deviation 3	Temperature deviation from its natural condition
Dissolved residue	mg/L	1000	1000	1000	2000	
Suspended residue	mg/L	50	50	400	400	
Inorganic Chemicals						
pH		6 - 9	6 - 9	6 - 9	5 - 9	If naturally the range is beyond, the pH determined based on natural condition
BOD	mg/L	2	3	6	12	
COD	mg/L	10	25	50	100	
DO	mg/L	6	4	3	0	Minimum limit
Total Phosphate as P	mg/L	0.2	0.2	1	5	
NO3 as N	mg/L	10	10	20	20	
NH3-N	mg/L	0.5	(-)	(-)	(-)	For fishery, contents of free ammonia for sensitive fishes ≤ 0.02 mg/L as NH3
Arsenic	mg/L	0.05	1	1	1	
Cobalt	mg/L	0.2	0.2	0.2	0.2	
Barium	mg/L	1	(-)	(-)	(-)	
Boron	mg/L	1	1	1	1	
Selenium	mg/L	0.01	0.05	0.05	0.05	
Cadmium	mg/L	0.01	0.01	0.01	0.01	
Chrome (VI)	mg/L	0.05	0.05	0.05	0.01	
Copper	mg/L	0.02	0.02	0.02	0.2	For conventional drinking water treatment, Cu ≤ 1 mg/L
Iron	mg/L	0.3	(-)	(-)	(-)	For conventional drinking water treatment, Fe ≤ 5 mg/L
Lead	mg/L	0.03	0.03	0.03	1	For conventional drinking water treatment, Pb ≤ 0.1 mg/L
Manganese	mg/L	0.1	(-)	(-)	(-)	
Mercury	mg/L	0.001	0.002	0.002	0.005	
Zinc	mg/L	0.05	0.05	0.05	2	For conventional drinking water treatment, Zn ≤ 5 mg/L
Chloride	mg/L	600	(-)	(-)	(-)	
Cyanide	mg/L	0.02	0.02	0.02	(-)	
Fluoride	mg/L	0.5	1.5	1.5	(-)	
Nitrite as N	mg/L	0.06	0.06	0.06	(-)	For conventional drinking water treatment, NO ₂ -N ≤ 1 mg/L
Sulfate	mg/L	0.03	0.03	0.03	(-)	
Free chlorine	mg/L	0.03	0.03	0.03	(-)	For ABAM is not required
Sulfur as H ₂ S	mg/L	0.002	0.002	0.002	(-)	For conventional drinking water treatment, S as H ₂ S ≤ 0.1 mg/L
Microbiology						
Fecal coliform	Number/100 ml	100	1000	2000	2000	For conventional drinking water treatment, fecal coliform ≤ 10000
Total coliform	Number/100 ml	1000	5000	10000	10000	

Appendix 5. TCLP of Hazardous Wastes

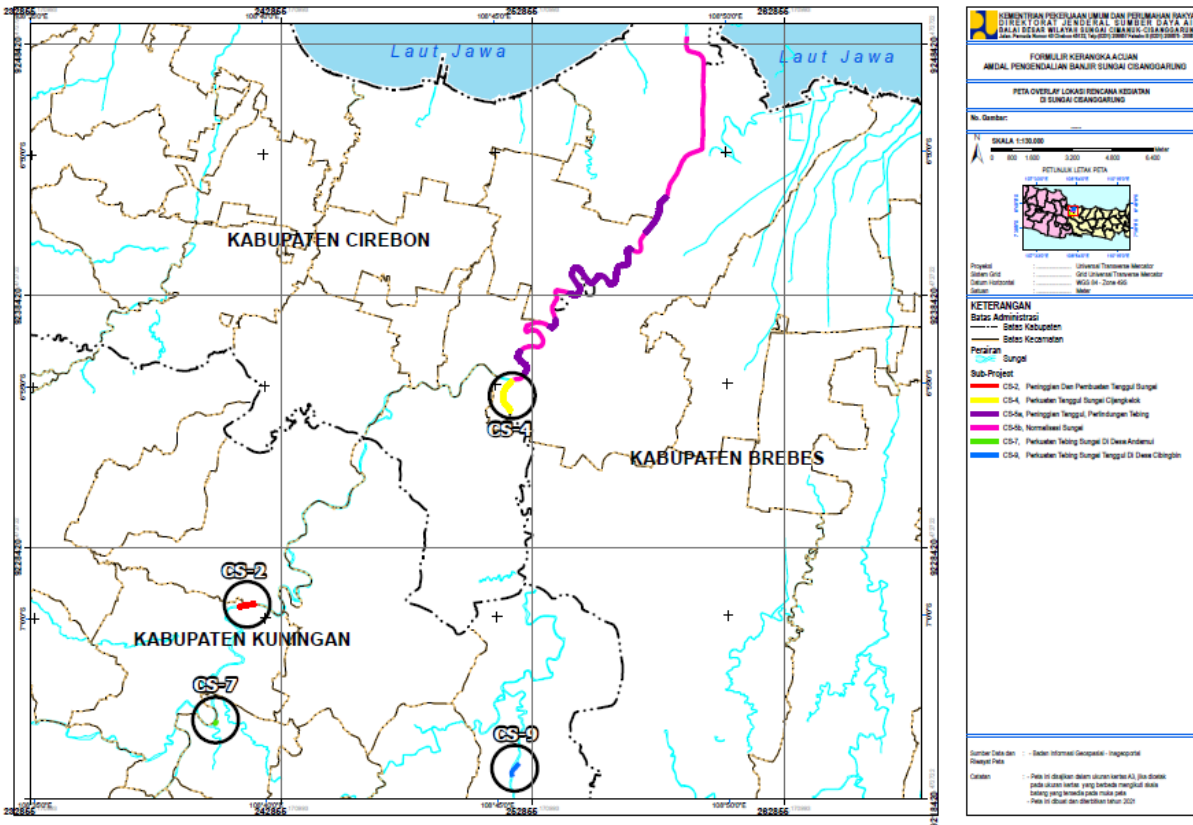
5.1 Characteristic (TCLP) Test for LB3 (Hazardous Wastes)



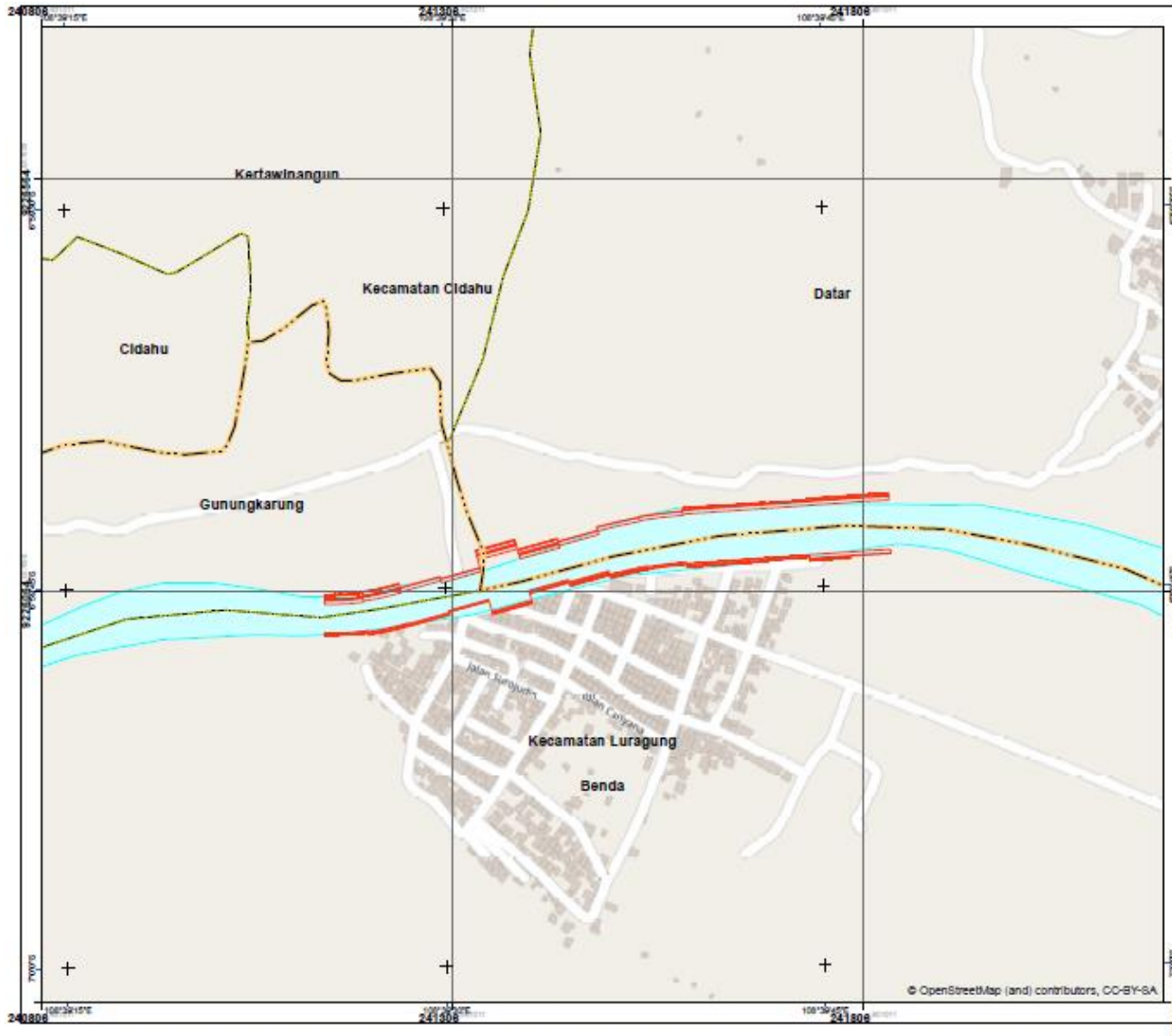
5.2 Threshold Values for Contaminants Identification

CONTAMINANT	TCLP ⁽¹⁾ -A	TK ⁽²⁾ -A	TCLP-B	TK-B	TCLP-C	TK-C
Unit (Dry Weight)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)
PARAMETERS						
ANORGANIC						
Antimony, Sb	6	300	1	75	0,4	3
Arsenic, As	3	2000	0,5	500	0,2	20
Barium, Ba	210	25000	35	6250	14	160
Beryllium, Be	4	4000	0,5	100	0,2	1,1
Boron, B	150	60000	25	15000	10	36
Cadmium, Cd	0,9	400	0,15	100	0,06	3
Chrome six vallances, Cr ⁶⁺	15	2000	2,5	500	1	1
Copper, Cu	60	3000	10	750	4	30
Lead, Pb	3	6000	0,5	1500	0,2	300
Mercury, Hg	0,3	300	0,05	75	0,02	0,3
Molybdenum, Mo	21	4000	3,5	1000	1,4	40
Nickel, Ni	21	12000	3,5	3000	1,4	60
Selenium, Se	3	200	0,5	50	0,2	10
Silver, Ag	40	720	5	180	2	10
Tributyltin oxide	0,4	10	0,05	2,5	0,02	R(3)
Zinc, Zn	300	15000	50	3750	20	120

Appendix 6. Project Description of Cisanggarung River FRM



Project Description of Cisanggarung River – CS-2



KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
DALAM RANGKAIAN RENCANA SUNGAI CIBANING CIBANGSARUNG
Jalan Pemuda Nomor 01 Cikole Kertawinangun Kabupaten Cirebon 08211 20875 20881

FORMULIR KERANGKA ACUAN
AMDAL PENGELOMPOKAN BAWAH SUNGAI CIBANGSARUNG

PETA OVERLAY LOKASI RENCANA KESATUN CS-2
DI SUNGAI CIBANGSARUNG

No. Gambar: _____

SKALA 1:5.000

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PETUNJUK LETAK PETA

Proyeksi: Universal Transverse Mercator
 Sistem Grid: Grid Universal Transverse Mercator
 Datum Horizontal: WGS 84 - Zone 49S
 Satuan: Meter

KETERANGAN

Batas Administrasi
 - - - - - Batas Kecamatan
 - - - - - Batas Kelurahan/Desa

Perairan
 Sungai

Sub-Projekt
 CS-2; Peninggian dan Pembuatan Tanggul Sungai

Sumber Data dan Rincian Peta
 - - - - - Badan Informasi Geospasial - Ingeposatel

Catatan
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 - Peta ini dibuat dan diterbitkan tahun 2021.

Project Description of Cisanggarung River – CS-4



KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDEKAL SUMBER DAYA AIR
DALAI DEKAT WILAYAH SUNGAI CIBANUK-CISANGGARUNG
Jalan Pemuda Nomor 40 Cirebon 40132, Telp. (0231) 2880174, Faksimil: (0231) 2880175

FORMULIR KERANGKA ACUAN
AMDAL PENDEKALIAN BANJIR SUNGAI CISANGGARUNG

PETA OVERLAY LOKASI RENCANA KEDATIAN CS-4
DI SUNGAI CISANGGARUNG

No. Gambar: _____

SKALA 1:5.000

PETAJALAN LETAK PETA

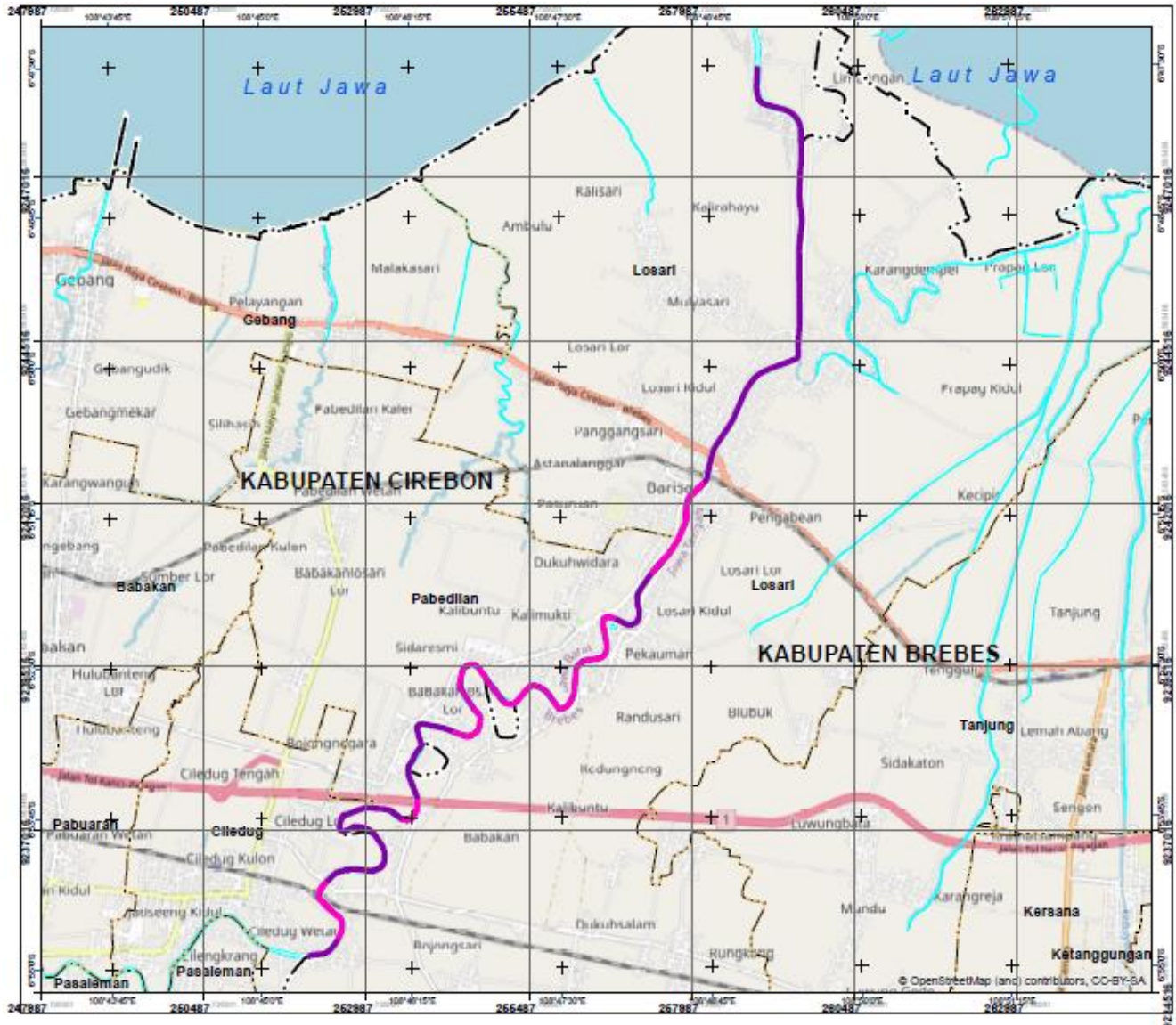
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 Sistem Grid : Grid Universal Transverse Mercator
 Datum Horizontal : WGS 84 - Zone 49S
 Satuan : Meter

KETERANGAN
 Batas Administrasi
 - - - - - Batas Kabupaten
 - - - - - Batas Kelurahan/Desa
 Perairan
 Sungai
 Sub Project
 CS-4; Perkuatan Tanggul Sungai Cijangkrik

Sumber Data dan Raster Peta : Badan Informasi Geospasial - Ingepasi

Catatan : Peta ini disajikan dalam ukuran kertas A3. Jika diunduh pada ukuran kertas yang berbeda mungkin akan terjadi perubahan pada muka peta.
 Peta ini dibuat dan diterbitkan tahun 2021

Project Description of Cisanggarung River – CS-5



KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
DALAM RANGKA WILAYAH SUNGAI CIBANUA-CISANGGARUNG
Salin Permis Nomor 40/2016/0112, Tanggal 02/01/2016, Nomor 1/2015/2089/1/2016

FORMULIR KERANGKA ACUAN
AMAL PENGENDALIAN BANJIR SUNGAI CISANGGARUNG

PETA OVERLAY LOKASI RENCANA KEGIATAN CS-5
DI SUNGAI CISANGGARUNG

No. Gambar: _____

SKALA 1:50.000

0 400 800 1.600 2.400 3.200 Meter

PETUNJUK LETAK PETA

Proyeksi: UTM
 Sistem Grid: Universal Transverse Mercator
 Datum: WGS 84 - Zone 49S
 Satuan: Meter

KETERANGAN

Batas Administrasi
 - - - - - Batas Kabupaten
 - - - - - Batas Kecamatan

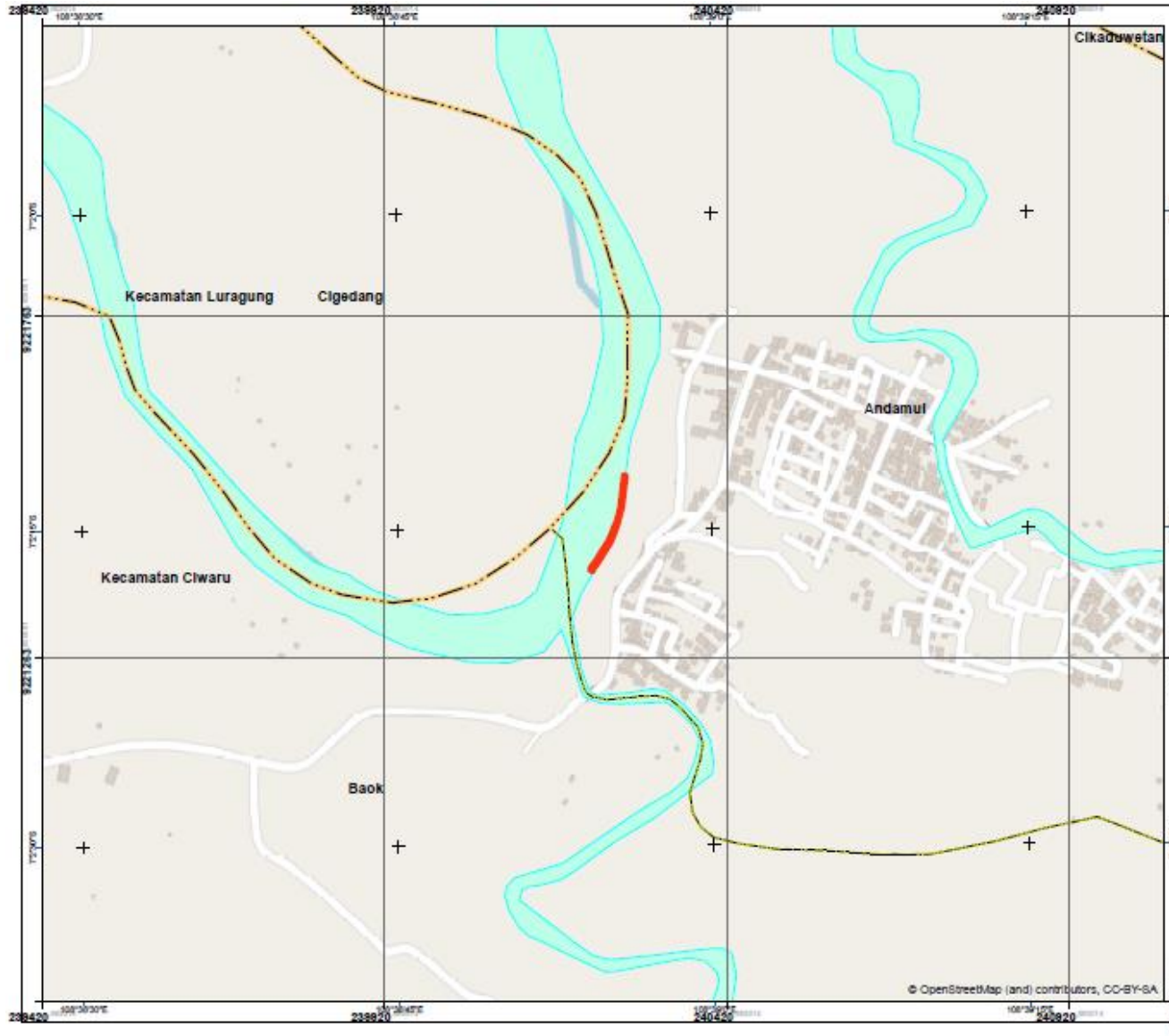
Perairan
 Sungai

Sub Project
 CS-5a; Peninggian Tanggul dan Perindungan Tebing
 CS-5b; Normalisasi Sungai

Sumber Data dan Riset Peta: Badan Informasi Geospasial - Ingeprognal

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Project Description of Cisanggarung River – CS-7



KEMENTERIAN PEKERJAAN UMUM DAN PERUBAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
DALAI DASAR WILAYAH SUNGAI CIBANGK-CISANGGARUNG
Atas Perintah Menteri © Cihangki, 14/05/2018; Perintah 18/2021/2018/2018

FORMULIR KERANGKA ACUAN
AMDAL PENDEKALIAN BANJIR SUNGAI CISANGGARUNG

PETA OVERLAY LOKASI RENCANA KEDAMPAAN CS-7
DI SUNGAI CISANGGARUNG

No. Gambar: _____

SKALA 1:6.000

0 75 150 225 300 Meter

RETUNJAH LETAK PETA

Proyeksi: UTM
 Sistem Grid: Universal Transverse Mercator
 Datum Horizontal: WGS 84 - Zone 49S
 Satuan: Meter

KETERANGAN

Batas Administrasi
 - - - - - Batas Kecamatan
 - - - - - Batas Kelurahan/Desa

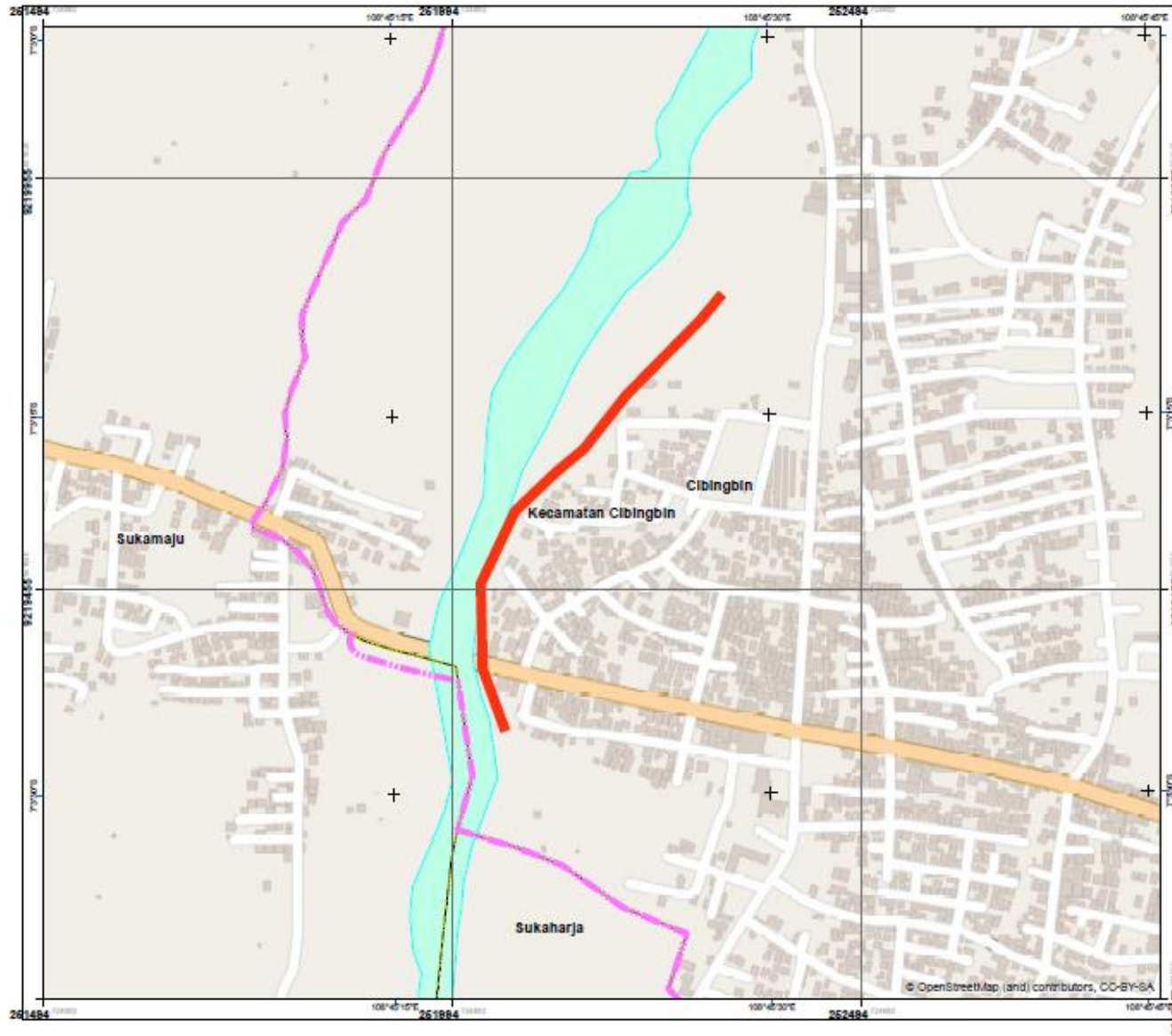
Perairan
 Sungai

Sub Project
 CS-7; Perkuatan Tebing Sungai Di Desa Andamul

Sumber Data dan Riset: Badan Informasi Geospasial - Inagoras
 Ciptaan: Peta ini diadopsi dalam ukuran letter A3, jika diadopsi pada ukuran letter yang berbeda mungkin akan terjadi perubahan pada peta. Peta ini dibuat dan diterbitkan tahun 2021.

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Project Description of Cisanggarung River – CS-9



KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
DALAM RANGKAIAN WILAYAH SUNGAI CIBANGKA-CISANGGARUNG
Jalan Pemuda Nomor 40 Cikembar 40132, Telp. (0201) 2988179, Faksimil: (0201) 298819 - 298819

FORMULIR KERANGKA ACUAN
AMDAL PENGELOMPOKAN BANGUN SUNGAI CISANGGARUNG

PETA OVERLAY LOKASI RENCANA KEGIATAN CS-9
DI SUNGAI CISANGGARUNG

No. Gambar: _____

SKALA 1:5.000

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PETA LOKASI LETAK PETA

PROJEKSI: Universal Transverse Mercator
 SISTEM GRID: Grid Universal Transverse Mercator
 DATUM HORIZONTAL: WGS 84 - Zone 48S
 SATUAN: Meter

KETERANGAN

Batas Administrasi
 - - - - - Batas Kecamatan
 ——— Batas Kelurahan/Desa

Perairan
 Sungai

Sub Project
 CS-9; Perkuatan Teling Sungai Tergantung Desa Cibingbin

Sumber Data dan Raster Peta
 - Badan Informasi Geospasial - Inagaportal
 - Raster Peta

Catatan
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 - Peta ini dibuat dan diterbitkan tahun 2021

Appendix 7. Inventory and Analysis of Flora and Fauna

A. Flora

Flora parameter data was collected as primary data in field observations using the inventory method and secondary data based on interviews with the surrounding community. The results of identifying vegetation types found around the location of the planned activity are presented in the following table.

Table 7. 1. Fauna Found Around the Location of Planned Flood Control Activities on the Cisanggarung River

No	Species Name	Local Name	Family	Status	Habitus
1	<i>Achyranthes aspera</i>	Jarong	Amaranthaceae	-	Bush
2	<i>Ageratum conyzoides</i>	Bandotan	Asteraceae	-	Bush
3	<i>Albizia chinensis</i>	Sengon	Fabaceae	-	woody tree
4	<i>Alocasia celebica</i>	Taro	Araceae	-	Non-woody tree
5	<i>Amorphophallus muelleri</i>	lles iles	Araceae	-	Shrub
6	<i>Anthocephalus chinensis</i>	Jabon	Rubiaceae	-	woody tree
7	<i>Arachis hypogaea</i>	Peanuts	Fabaceae	-	Shrub
8	<i>Asystasia gigantea</i>	israeli grass	Acanthaceae	-	Bush
9	<i>Bambusa blumeana</i>	Bamboo thorns	Poaceae	-	Non-woody tree
10	<i>Bambusa</i> sp	Bamboo	Poaceae	LC	Non-woody tree
11	<i>Bambusa vulgaris</i> var. striata	yellow bamboo	Poaceae	-	Non-woody tree
12	<i>Calotropis gigantea</i>	Biduri	Asclepiadaceae	-	Shrub
13	<i>Carica papaya</i>	Pawpaw	Caricaceae	DD	Non-woody tree
14	<i>Caryota no</i>	King's Sarai Palm	Arecaceae	LC	Shrub
15	<i>Ceiba pentandra</i>	Randu	Malvaceae	LC	woody tree
16	<i>Celosia argentea</i>	Baroco	Amaranthaceae	LC	Bush
17	<i>Centrosema pubescens</i>	Centro	Fabaceae	-	Bush
18	<i>Chromolaena odorata</i>	Kirinyuh	Asteraceae	-	Shrub
19	<i>Cnidoscolus aconitifolius</i>	Japanese Papaya	Euphorbiaceae	LC	Non-woody tree
20	<i>Cocos nucifera</i>	Coconut	Arecaceae	-	Non-woody tree
21	<i>Costus special</i>	pacing pin	Costaceae		Shrub
22	<i>Crinum asiaticum</i>	white daffodils	Amaryllidaceae	-	Shrub
23	<i>Cyperus rotundus</i>	puzzle grass	Poaceae	LC	Bush
24	<i>Dendrocalamus asper</i>	bamboo	Poaceae	-	Non-woody tree
25	<i>Desmodium triquetrum</i>	sitting leaves	Fabaceae	-	Shrub
26	<i>Ficus racemosa</i>	Fig	Moraceae	LC	woody tree
27	<i>Ficus septica</i>	Awarawar	Moraceae	LC	woody tree
28	<i>Gigantochloa pseudorundinacea</i>	andong bamboo	Poaceae	-	Non-woody tree
29	<i>Gigantochloa robusta</i>	Mayan bamboo	Poaceae	-	Non-woody tree
30	<i>Ipomoea cairica</i>	Sweet potato	Convolvulaceaa	LC	Bush

No	Species Name	Local Name	Family	Status	Habitus
31	<i>Leucaena leucocephala</i>	Lamtoro	Fabaceae	LC	woody tree
32	<i>Lophatherum gracile</i>	Bamboo grass	Poaceae	-	Bush
33	<i>Mangifera indica</i>	Mango	Anacardiaceae	DD	woody tree
34	<i>Manihot utilissima</i>	cassava	Euphorbiaceae	-	Shrub
35	<i>Melaleuca leucadendra</i>	eucalyptus	Myrtaceae	DD	woody tree
36	<i>Mikania micrantha</i>	vines	Asteraceae	-	Liana
37	<i>Mimosa pudica</i>	Mimosa	Fabaceae	LC	Bush
38	<i>Muntingia calabura</i>	Cherry	Muntingiaceae	-	woody tree
39	<i>Musa</i> sp	Banana	Musaceae	LC	Non-woody tree
40	<i>Ochroma pyramidale</i>	Balsa	Malvaceae	LC	woody tree
41	<i>Oryza sativa</i>	Paddy	Poaceae	-	Bush
42	<i>Passiflora foetida</i>	Rambusa	Passifloraceae	-	Bush
43	<i>Pennisetum purpureum</i>	elephant grass	Poaceae	LC	Bush
44	<i>Physalis minima</i>	Ciplukan	Solanaceae	VU	Bush
45	<i>Pluchea indica</i>	Beluntas	Asteraceae	-	Shrub
46	<i>Plumeria</i> sp	Cambodia Cemetery	Apocynaceae	-	Non-woody tree
47	<i>Psidium guajava</i>	Guava	Myrtaceae	LC	woody tree
48	<i>Ricinus communis</i>	Kepyar distance	Euphorbiaceae	-	woody tree
49	<i>Solanum torvum</i>	Eggplant takokak	Solanaceae	-	Shrub
50	<i>Swietenia mahagoni</i>	Mahogany	Meliaceae	NT	woody tree
51	<i>Tectona grandis</i>	teak	Verbenaceae	-	woody tree
52	<i>Terminalia catappa</i>	Ketapang	Combretaceae	LC	woody tree
53	<i>Vigna radiata</i>	Mung beans	Fabaceae	LC	Shrub
54	<i>Vigna unguiculata</i> ssp. <i>sesquipedalis</i>	Long beans	Fabaceae	-	Shrub
55	<i>Zea mays</i>	Corn	Poaceae	LC	Shrub
56	<i>Zingiber officinale</i>	Ginger	Zingiberaceae	-	Shrub

Source: Analysis Results, 2021

The types of flora found included types commonly found in other locations or including wild plant species in trees, shrubs, and shrubs. And based on the table above shows that there are no types of flora that are included in the protected category according to the Law of the Republic of Indonesia No. 05 of 1990 concerning Conservation of Biological Natural Resources and Their Ecosystems, Government Regulation of the Republic of Indonesia No. 07 of 1999 concerning Preservation of Plant and Animal Species, and Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.106/MENLHK/SETJEN/KUM.1/12/2018 concerning the Second Amendment to the Regulation of the Minister of Forestry Environment Number P.20/MENLHK /SETJEN/KUM.1/6/2018 concerning Protected Types of Plants and Animals. Some plants have the IUCN Red List (2021) conservation status, LC (*least concern*), which means the plant does not meet the requirements to be included in the critically endangered, endangered, vulnerable or endangered category. In addition, there are also plants with DD conservation status (*data deficient*) which means that the current information or data about the plant species is insufficient to estimate the risk of extinction based on distribution and population status (data abundance). The following is a description of the flora found at the activity site.



Figure 7. 1. Flora Around the Location of the Planned Activities

B. Fauna

The presence of fauna follows the presence of flora in an area. Vegetation is the dominant part of the habitat and provides a variety of animal needs ranging from shelter, breeding, and food sources (Fleming, 1992). So the observation of terrestrial fauna is also carried out in the observation of terrestrial flora. The following presents the results of identifying fauna found in the area around the planned activity location.

Table 7. 2. Fauna Found Around the Location of Planned Flood Control Activities on the Cisanggarung River

No	Species Name	Indonesian name	Family	Status	
AVIFAUNA					
1	<i>Ardeola speciosa</i>	rice field	Ardeidae	PP	LC
2	<i>Artamus leucorhynchus</i>	Pork Kep	Artamidae	-	-
3	<i>Bubulcus ibis</i>	Buffalo egret	Ardeidae	-	LC
4	<i>Centropus sinensis</i>	Big lathe	Cuculidae	-	LC
5	<i>Collocalia esculanta</i>	Beef swallow	Apodidae	-	-
6	<i>Collocalia linchi</i>	Swallow linchi	Apodidae	-	LC
7	<i>Egretta garzetta</i>	Little egret	Ardeidae	UU/PP	LC
8	<i>Geopelia striata</i>	Java turtledove	Columbidae	-	LC
9	<i>Halcyon chloris</i>	the river	Alcedinidae	UU/PP/PM	LC
10	<i>Halcyon cyanoventris</i>	Javanese geek	Alcedinidae	UU/PP/PM	LC
11	<i>Hirundo striolata</i>	Striped Kite	Hirundinidae	-	-
12	<i>Hirundo Tahitica</i>	Stone kite	Hirundinidae	-	LC
13	<i>Lonchura maja</i>	Hajj Bondol	Estrildidae	-	LC
14	<i>Lonchura punctulata</i>	Pekingese Bondol	ploceidae	-	LC
15	<i>Orthotomus sutorius</i>	Banana Cinenen	Silviidae	-	LC
16	<i>Passer montanus</i>	Erasian church	ploceidae	-	LC
17	<i>Prinia flaviventris</i>	Javanese perenjok	Cisticolidae	-	LC
18	<i>Prinia inornata</i>	Rice Planter	Cisticolidae	-	LC

No	Species Name	Indonesian name	Family	Status	
19	<i>Pycnonotus aurigaster</i>	finches	Pycnonotidae	-	LC
20	<i>Hirundo Stena</i>	Ordinary sea damsel	Sternidae	UU/PP/PM	LC
21	<i>Turnix suscitator</i>	Fat stripe	Turnicidae	-	LC
	INSECTA				
1	<i>Oxya japonica</i>	Grasshopper	Acrididae	-	-
2	<i>Phlaeoba fumosa</i>	Brown grasshopper	Acrididae	-	-
3	<i>Haematopota</i> sp.	Fly	Tabanidae	-	-
4	<i>Lumbricus rubellus</i>	Earthworms	Lumbricidae	-	-
5	<i>Nephila pilipes</i>	Spider	Araneidae	-	LC
6	<i>Pheidogeton</i> sp .	Ant	Formicidae	-	-
7	<i>Crocothemis servilia</i>	Dragonfly grabs black line	Libellulidae	-	LC
8	<i>Diplacodes trivialis</i>	Blue dragonfly	Libellulidae	-	LC
9	<i>Orthetrum sabina</i>	Rhino Dragonfly	Libellulidae	-	LC
10	<i>Pantala flavescens</i>	Dragonfly traveling around the world	Libellulidae	-	LC
11	<i>Ancyloxypha numitor</i>	Butterfly	Hesperiidae	-	-
12	<i>Catochrysops strabo</i>	Butterfly	Lycaenidae	-	-
13	<i>gilippus lakes</i>	Butterfly	Nymphalidae	-	-
14	<i>Lakes plexippus</i>	Butterfly	Nymphalidae	-	-
15	<i>Eurema blanda</i>	Butterfly	Pieridae	-	-
16	<i>Eurema Hecabe</i>	Sulfur butterfly	Pieridae	-	-
17	<i>Hylephila phyleus</i>	Butterfly	Hesperiidae	-	-
18	<i>Jamides lacteata</i>	Butterfly	Lycaenidae	-	-
19	<i>Junonia orithya</i>	Butterfly	Nymphalidae	-	-
20	<i>Leptosia nina</i>	Butterfly	Pieridae	-	-
21	<i>Mycalesis mineus</i>	Butterfly	Nymphalidae	-	-
22	<i>Neptis Hylas</i>	Butterfly	Nymphalidae	-	-
23	<i>Papilio satapes</i>	Butterfly	Papilionidae	-	-
24	<i>Phyciodes cocyta</i>	Butterfly	Nymphalidae	-	-
25	<i>Speyeria diana</i>	Butterfly	Nymphalidae	-	-
26	<i>Taractrocera archias</i>	Butterfly	Hesperiidae	-	-
27	<i>Tirumala septentrinis</i>	Butterfly	Nymphalidae	-	-
28	<i>Ypthima horsfieldii</i>	Butterfly	Nymphalidae	-	-
	REPTILE				
1	<i>Varanus salvator</i>	Water monitor	Varanidae	-	LC
2	<i>Eutrophic multifasciata</i>	garden lizard	Scincidae	-	LC
3	<i>Enhydris plumbea</i>	Rice snake	Homolopsidae	-	LC
	NEKTON				
1	<i>Macrobrachium rosenbergii</i>	giant prawns	Palaemonidae	-	LC
2	<i>Barbodes binotatus</i>	Wader Fish	Cyprinidae	-	LC
3	<i>Mystus nigriceps</i>	Keting fish	Bagridae	-	LC
4	<i>Trichogaster microlepis</i>	Shotfish	Osphronemidae	-	-
5	<i>Valamugil speigleri</i>	Mullet	Mugilidae	-	-

Source: Analysis Results, 2021

Based on the table above, the most common fauna found were groups of insects or insects, namely 25 species, while the Aves group found 21 species, the reptile group found 3 species, and the nekton found 5 species.

From the results of the analysis of land fauna and nekton, none of them are included in the protected category according to the Law of the Republic of Indonesia No. 05 of 1990 concerning Conservation of Biological Natural Resources and Their Ecosystems, Government Regulation of the Republic of Indonesia No. 07 of 1999 concerning Preservation of Plant and Animal Species, and Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.106/MENLHK/SETJEN/KUM.1/12/2018 concerning the Second Amendment to the Regulation of the Minister of Forestry Environment Number P.20/MENLHK /SETJEN/KUM.1/6/2018 concerning Protected Types of Plants and Animals. Meanwhile, according to the IUCN Red List 2021, there is fauna that is identified as being in the category of LC (*least concern*) conservation status, which means that the fauna has been evaluated/identified but does not meet the requirements to be categorized as critically endangered, threatened with extinction, vulnerable or nearly extinct. The following is a description of the fauna found at the activity location.



Figure 7. 2. Fauna Around the Location of the Planned Activities

Appendix 8. Dredging Management Plan (Template)

This is a general template of dredging management plan, and the Contractor is responsible to adjust and prepare a detailed and site specific plan.

(Source: chrome- https://www.epa.sa.gov.au/files/14229/flinders_ports_dredging_plan_2019.pdf with simplification and modifications)

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Appendix 9. Public Consultation

9.1 Announcement and Information Disclosure

Referring to Government Regulation of the Republic of Indonesia Number 22 of 2021 concerning Implementation of Environmental Protection and Management, the initiator involves the affected community in the preparation of the AMDAL. One form of community involvement is public consultation. The implementation of community involvement in the AMDAL and Environmental Permit processes is carried out based on the fundamental principles:

- Providing transparent and complete information
- Equality of position among the parties involved
- Fair and wise problem solving
- Coordination among related parties.



DLH Cirebon



Losari Subdistrict
Brebes Regency



DLHPS Brebes



Losari Subdistrict
Cirebon Regency



Andamui Village



Bojongnegara Village



Cibingbin Village



Ciledug Kulon Village



Jatiseeng Kidul Village



Limbangan Village



Kedungneng Village



Pasuruan Subdistrict

9.2 Coordination, Planning and Participants of Public Consultation

The public consultation for the Cisanggarung River Flood Control was carried out by involving the affected communities. Before the implementation of the public consultation, the proponent coordinates with:

1. Relevant agencies (West Java Provincial Environmental Service, Brebes Regency Environmental Service, and Cirebon District Police, affected Districts, and affected District and Village Governments)
2. Community leaders who will be involved in the public consultation process (Head of affected village, Mrs. PKK, and community leaders/affected people)

After coordinating with all relevant parties, it was decided that public consultation activities for the Cisanggarung River Flood Control proposed subproject were carried out with the following details

1. Tuesday, 08 February 2022, session 1 at 08.00 – 12.00 at the Losari District Office, Brebes Regency
2. Tuesday, February 8, 2022, session 2 at 08.00 – 12.00 at the Ciledug District Office, Cirebon Regency
3. Tuesday, February 8, 2022, session 3 at 13.00 – finished at the Losari District Office, Cirebon Regency

Public consultations are carried out face-to-face. The implementation of public consultations is carried out by complying with health protocols for preventing the transmission of Coronavirus Disease (Covid-19), which are carried out as follows.

1. Maintain distance between participants by providing space between seats and the registration queue.
2. Participants must wear a mask that covers the nose and mouth.
3. Provide hand washing facilities using soap and water or alcohol-based hand sanitizer.

4. Before entering the public consultation location, participants must wash their hands with soap or hand sanitizer.

Participants in the public consultation on Cisanggarung River Flood Control consisted of several community elements. Given the Covid-19 outbreak, the local government has limited the number of people included in this public consultation. The following table presents the composition of the participants in the public consultation at each meeting (session) held.

Table 18. Participants in the Public Consultation of Losari District, Brebes Regency

No	Participant Element	Amount (person)	Percentage (%)
1	Affected Communities	20	49%
2	Village/District Government	14	34%
3	Initiator	3	7%
4	Related agencies	-	0%
5	TNI/POLRI	4	10%
	TOTAL	41	100%

Source: Public Consultation Questionnaire, processed by the compilers of 2022

The total number of participants in the public consultation in Losari Sub-district, Brebes Regency, was 41 people, with the majority of the affected community being 49% (20 people).

Table 19. Participants of the Public Consultation in Ciledug District, Cirebon Regency

No	Participant Element	Amount (person)	Percentage (%)
1	Affected Communities	22	52%
2	Village/District Government	7	17%
3	Initiator	3	7%
4	Related agencies	3	7%
5	TNI/POLRI	7	17%
	TOTAL	42	100%

Source: Public Consultation Questionnaire, processed by the compilers of 2022

The total number of participants in the public consultation in Ciledug Sub-district, Cirebon Regency, was 42 people, with the majority of the affected community being represented as much as 52% (22 people).

Table 20. Participants of the Public Consultation of Losari District, Cirebon Regency

No	Participant Element	Amount (person)	Percentage (%)
1	Affected Communities	21	45%
2	Village/District Government	15	34%
3	Initiator	3	7%
4	Related agencies	3	7%

No	Participant Element	Amount (person)	Percentage (%)
5	TNI/POLRI	3	7%
	TOTAL	44	100%

Source: Public Consultation Questionnaire, processed by the compilers of 2022

The total number of participants in the public consultation in Losari Sub-district, Cirebon Regency, was 44 people, with the majority of the affected community being represented as much as 45% (21 people).

9.3 Documentation Records

Tuesday, February 8, 2022, session 1 at 08.00 – 12.00 at the Losari Subdistrict Office, Brebes Regency



Tuesday, February 8, 2022, session 2 at 08.00 – 12.00 at the Ciledug Subdistrict Office, Cirebon Regency





Tuesday, February 8, 2022, session 3 at 13.00 – finished at the Losari Subdistrict Office, Cirebon Regency


















In the public consultation, the proponent conveys information about the planned activity, including a description of the scheduled activity, potential impacts, and the affected environmental components. The seminar method carries out the submission of information related to the planned action. Information is conveyed through Presentation Slides with the help of an LCD Projector. Furthermore, the community will submit suggestions, opinions, and responses to the planned activity based on the information presented. The initiator and related parties can then submit their responses to the community's input.


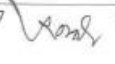














9.4 List of Attendants

**DAFTAR HADIR KONSULTASI PUBLIK
AMDAL PENGENDALIAN BANJIR SUNGAI CISANGGARUNG
PROVINSI JAWA TENGAH DAN JAWA BARAT**

Hari/ Tanggal : Selasa/ 08 Februari 2022
Tempat : Kantor Kecamatan Ciledug, Kabupaten Cirebon
Pukul : 08.00-12.00 WIB

NO	NAMA	ALAMAT / INSTANSI	TANDA TANGAN
1	M. MARZULIAH	BBLW CIMAHI Jl. Pemuda No. 43	1 
2	Suciyo	REWS KIMANCIS	2 
3	Imas. M.	Cibinong	3 
4	Riz	- - -	4 
5	Zainal Arifin	KORAMI dg/ Pasuruan	5 
6	P. Sugandi	Kec. Luragung	6 
7	Dadang. FH. UH-H	Ka Poltek Cileug	7 
8	Cora, S.kap. MM.	Kana Samapta PASCAL CIBINONG	8 
9	Nani K, SH	Kapasda waled	9 
10	Haryanto	Korami Luragung	10 
11	H. eru Sabrina	Pendes Cibinong	11 
12	Aan Jatrika	Koboh	12 
13	CASNAHI	DKKOH	13 
14	Harisat. M.	Ciledug/kec	14 
15	WAWAN	ke. Pasuruan	15 

DAFTAR HADIR KONSULTASI PUBLIK
AMDAL PENGENDALIAN BANJIR SUNGAI CISANGGARUNG
PROVINSI JAWA TENGAH DAN JAWA BARAT

NO	NAMA	ALAMAT / INSTANSI	TANDA TANGAN
16	Risdi	Des. Jatisraya Kidul.	16 
17	H. Rohens	Des. Cilengkray	17 
18	SUHARJO	Camat Cilengkray	18 
19	Pisumunandar	Dinas. Putra King	19 
20	Ehas	Des. Ciledug	20 
21	KURNIA	Des. Perbuaran	21 
22	DAIMAN SALEH	CILEDUG VETAN	22 
23	Wanwan. H.	Ciledug Kulon	23 
24	Dodo Widayati	Des. Ciledug Lor	24 
25	Ade. M.	KORAMI 1506.	25 
26	ZARMI DI	KORAMI 1506	26 
27	JIS Kusmana	JIS KEDUL	27 
28	Imam Kukuh	Ciledug Lor	28 
29	Iman Uwes	Bojonegara	29 
30	HEMI. W	Polsek Palsuran	30 
31	UMAR	Ciledug Watan	31 

DAFTAR HADIR KONSULTASI PUBLIK
AMDAL PENGENDALIAN BANJIR SUNGAI CISANGGARUNG
PROVINSI JAWA TENGAH DAN JAWA BARAT

NO	NAMA	ALAMAT / INSTANSI	TANDA TANGAN
32	M. Ali P.	Tommas	³²
33	A. Setiawan	Aggr sel psker	³³
34	M. Amin	Babinsa koramil	³⁴
35	Sri S.	Cil kalon	³⁵
36	Darsono	Ciledug Lor	³⁶
37	Juwana	Ke polsek uos	³⁷
38	Atta	Pd Lawangan	³⁸
39	Wahid	DS. Cileugutan	³⁹
40	Adi M	DLH	⁴⁰
41	Ardi	-	⁴¹
42	Hend	-	⁴²
43			⁴³
44			⁴⁴
45			⁴⁵
46			⁴⁶
47			⁴⁷