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SOCIALIST REPUBLIC OF VIETNAM

PROJECT MANAGEMENT UNIT NO. 2 – SOC TRANG PROVINCE

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Project: Mekong Delta integrated climate resilience and sustainable livelihoods (MD-ICRSL)

Subproject: INVESTMENT IN INFRASTRUCTURE CONSTRUCTION SERVING FOR PRODUCTION CONVERSION APPROPRIATE TO ECOLOGICAL CONDITION, LIVELIHOOD IMPROVEMENT, ADAPTATION TO CLIMATE CHANGE IN CU LAO DUNG

ENVIRONMENT AND SOCIAL IMPACT ASSESSMENT

June/2019

IMAGE LIST

LIST OF TABLES

GENERAL INTRODUCTION AND DESCRIPTION OF THE SUB-PROJECT

1. Project origin:

The Mekong Delta (covering an area of about 40,000 km^2) is located at the end of the Mekong River, west, southwest and south by the sea (700 km long coastline) is an important economic and ecological area of Vietnam. The Mekong Delta has 1 city and 12 provinces with a population of about 17.74 million in 2017 (accounting for 18.9% of the country's population). The Mekong Delta is the main rice production area, aquaculture and shrimp farming area of the country, however, in recent years, half of the region's area has been flooded for 3-4 months per year, making it difficult for agricultural production and people's life. Besides, water resources and sediment are important factors for agricultural development in the Mekong Delta. Due to the low topography, the Mekong Delta is considered as an area of high risk of impact due to climate change and sea level rise.

To strengthen the capacity to manage and adapt to climate change through improving planning, promoting sustainable livelihoods and building climate resilient infrastructure in selected provinces in the Mekong Delta, Project "Resisting synthetic climate and sustainable livelihoods in the Mekong Delta" with a total cost of US $ 370 million (of which governmental capital is US $ 70 million and IDA capital is US $ 300 million) being implemented since 2016 - 2022 under the Credit Agreement signed between the Socialist Republic of Vietnam and the World Bank on May 19, 2016 according to Document No. 5845-VN. The project has 5 components including 10 projects.

Component I: Strengthening the monitoring, analysis and database system;

Component II: Upstream flood management. This component consists of 3 subprojects:

Subproject 1: Improve flood drainage and climate change adaptation for Long Xuyen Quadrangle; Subproject 2: Strengthening adaptability and water management for the upper reaches of the Cuu Long River, An Phu District, An Giang Province; Subproject 3: Improving flood drainage capacity and developing sustainable livelihoods, adapting to climate for Dong Thap Muoi (districts in the North of Dong Thap province).

Component III: Adaptation to salinity conversion in estuaries. This component includes 4 subprojects: Subproject 4: Investing in infrastructure construction for sustainable livelihood development for people in Ba Tri coastal area, Ben Tre province to adapt to climate change; Subproject 5: Investment in building infrastructure to improve livelihoods for people in north of Thanh Phu district, Ben Tre province to adapt to climate change; Subproject 6: Controlling water sources, adapting to climate change in the South

of Mang Thit, Tra Vinh and Vinh Long provinces; Subproject 7: Investing in construction of infrastructure to serve production conversion in accordance with ecological conditions, improving livelihoods, adapting to climate change in Cu Lao Dung area.

Component IV: Protection of coastal areas of the peninsula. This component consists of 3 subprojects: Subproject 8: Investment in infrastructure construction to prevent coastal erosion, supply fresh water and serve shrimp farming - forest to improve livelihoods, adapt to climate change in coastal areas of Ca Mau province; Subproject 9: Investing in infrastructure construction to prevent coastal erosion and supporting aquaculture in An Minh and An Bien districts; Subproject 10: Investing in infrastructure construction to protect and develop ecological forests, improve livelihoods, adapt to climate change in Hoa Binh, Dong Hai and Bac Lieu city.

Component V: Support project management and implementation.

Subproject "Investing in infrastructure construction for production conversion in accordance with ecological conditions, improving livelihoods to adapt to climate change in Cu Lao Dung area" is subproject No.7, within the component 3 of the ICRSL project, with the following components:

- Convert production in accordance with natural conditions and adapt to climate change-SLR.
- Planting and rehabilitating coastal forests
- Building technical infrastructure to serve production conversion and protection

The project will comply with the regulations on environmental protection of the Government of Vietnam and the World Bank's Safeguard Policy. Accordingly, during the preparation phase, the Environmental and Social Management Framework (ESMF) and the Regional Environmental Impact Assessment were developed. The subprojects will be screened for the environment according to the procedures in the ESMF so as to determine the requirements for environmental documents to be developed for the subproject. The results of the regional environmental assessment were used to develop the project and the relevant information will also be used in the subproject environmental preparation process.

2. Agencies and organizations approved the feasibility study report

People's Committee of Soc Trang

According to the Law on Environmental Protection No.55/2014/QH13, Decree No. 18/2015/ND-CP, the subproject must compile a report environmental impact assessment (EIA) process Department of Natural Resources Soc Trang provincial environmental approval.

3. The planning and related projects:

3.1. Planning Related

- Development planning Electricity Cu Lao Dung District, Soc Trang Province period 2016-2022.
- Spatial planning synthesis (ISP) coastal Cu Lao Dung District period 2016 to 2020 and vision to 2030 with the objective to ensure the harmonious development and sustainable between economic sectors (agriculture - forestry - fisheries, industry/ handicraft industry and services), between the protection of ecological environment and coastal zone with rational exploitation of sources of natural resources, improving the quality of labor and social security.
- Development planning socio - economic period 2011 - 2015 and orientations to 2020
- Planning seafood Soc Trang province to 2020 and vision to 2030 was chairman of the People's Committee of Soc Trang Province on approval in Decision No.690/QDHC-CTUBND dated 01/7/2014.

3.2. Related projects

- The project "Improving and upgrading irrigation systems serving aquaculture Cu Lao Dung District" has been implemented since 2015 to date to renovate and upgrade the system of intra-field canals in Cu Lao Dung, with total funding of 86.9 billion.
- Project of Coastal Resources for Sustainable Development (CRSD) was launched in 2012 to 2017 with total capital is USD 117.9 million. The overall objective of the project is to improve the management of coastal fisheries in a sustainable way in the coastal provinces of Vietnam selected. Subproject 7 will inherit the form of project support for models CRSD livelihoods.

4. Legal basis:

4.1. Legal basis of Vietnam

The legislation applies to the environmental impact assessment and environmental management process of preparation, construction, operation sub-project.

- Environmental Protection Law No. 55/2014 / QH13 of the National Assembly dated 23/16/2014 issued regulations on environmental protection, the rights and obligations of organizations, households and individuals related to environmental protection activities.
- Fisheries Law No. 17/2003/QH11 November 26, 2003 shall apply to fishery activities of organizations and individuals in Vietnam, organizations and individuals on the mainland and islands, internal waters, territorial sea, exclusive economic zone and continental shelf of the Republic of socialist Vietnam.
- Law on Prevention and Disaster No.33/2013/QH13 of the National Assembly dated 19

May 06 2013 regulations on the prevention of natural disasters, the rights and obligations of agencies, organizations, households, individuals involved in prevention of natural disasters, state management and resources ensure the implementation of prevention and disaster.

- Law on Safety and Health at Work No. 84/2015/QH13 of the National Assembly dated June 25, 2015.
- Land Law No.45/2013/QH13 Congressional issued November 29, 2013.
- Water Resources Law No. 17/2012/QH13 of the National Assembly June 21, 2012 provides for the management, protection, exploitation and use of natural resources water, prevention and remedial harm caused by water in the territory of Vietnam.
- The Labor Code 10/2012 / QH13 of the National Assembly June 18, 2012 specified labor standards; rights, obligations and responsibilities of workers, the employers, organizations representing labor collectives, organizations representing employers in labor relations and other relations directly related labor relations; State management over labor.
- Law amending and supplementing some articles of cultural heritage law No.32/2009/QH12 of the National Assembly June 16, 2009.
- Heritage Law No. 28/2001/QH10 of the National Assembly June 29, 2001 provides for the protection and promotion of cultural heritage values; define the rights and obligations of organizations and individuals for cultural heritage in the Republic of Socialist Vietnam.
- Biodiversity Law No. 20/2008/QH12 issued November 13, 2008 provides for the conservation and sustainable development of biodiversity; rights and obligations of organizations, households and individuals in conservation and sustainable development of biodiversity.
- Law on forest protection and development 29/2004/QH11 issued December 3, 2004 provides for the management, protection, development and use of forests; rights and obligations of forest owners.
- Decree No. 59/2015/ND-CP of June 18, 2015, on management of investment projects on construction
- Decree No. 01/2017/ND-CP of January 6, 2017 on amending and supplementing a number of decrees providing detailed regulations to implement the land law.
- Decree No. 39/2015/ND-CP of April 27, 2015 regulations support policies for women in poor households who minority childbirth correct population policy.
- Decree No. 38/2015/ND-CP, issued April 24, 2015 regulations on waste management and waste, replacing a number of articles of Decree No. 59/2007/ND-CP 09/4/2007 Government's regulations on solid waste management.
- Decree No. 18/2015/ND-CP of the Government dated 14 January 02, 2015 provides for

the planning of environmental protection, environmental assessment strategies, environmental impact assessment and protection plan environment.

- Decree No. 43/2014/ND-CP of the Government issued on May 15, 2014 5 years detailing the implementation of some articles of the law No. 45 land 2013/QH13.
- Decree No. 47/2014/ND-CP of the Government on 15 May 2014 year issued regulations about compensation, resettlement assistance when the State revoked the land.
- Decree No. 201/2013/ND-CP of the Government on 27 November 2013 year issued regulations detailing the implementation of some articles of the law on water resources.
- Decree No. 67/2012 / ND-CP of the Government dated 10 May 09 2012 on amending and supplementing some articles of Decree No. 143/2003 / ND-CP of November 28, 2003 regulations detailing the implementation of some articles of the Ordinance on exploitation and protection of irrigation works.
- Decree No. 140/2006/ND-CP, issued November 22, 2006 provides for the protection of the environment in the stages of formulation, appraisal, approval and implementation of the strategy, planning plans, programs and development projects.
- Circular No. 36/2015/TT-BTNMT of Natural Resources and Environment Ministry of June 30, 2015 on the management of hazardous waste.
- Circular No.27/2015/TT-BTNMT of the Ministry of Natural Resources and Environment issued May 29, 2015 provides for environmental assessment strategies, environmental impact assessment and plans for environmental protection.
- Circular No. 26/2015/TT-BNN dated 29/07/2015 of the Ministry of Agriculture and Rural Development amending and supplementing some articles of Circular No. 24/2013 / TT-BNN dated 06/5 / two thousand and thirteen.
- Circular No. 24/2017/TT-BTNMT 01.09.2017 Ministry of Natural Resources and Environment Specification Environmental Monitoring.
- Circular No. 30/2014/TT-BTNMT of the Ministry of Natural Resources and Environment issued May 15, 2014 provides for allocation record, lease and transfer of land use purposes, land acquisition.
- Circular No. 24/2013 /TT-BNN of the Ministry of Agriculture and Rural Development dated 06 March 2013 05 provides for afforestation replaced when transferred to the intended use of forests for other purposes.
- Circular No. 19/2011/TT-BY MOH dated 06 06 2011 guide occupational health management, health workers and occupational diseases.

Standards and regulations applicable

- QCVN 26/2016/BYT-national technical regulation on microclimate-value allows micro-climate in the workplace;
- TCVN 6438:2005 road transport. The biggest limitation of emissions;

- QCVN 14:2008/BTNMT-national technical regulation on waste water;
- QCVN 6:2009/BTNMT-national technical regulation of some toxic substances in the ambient air;
- QCVN 26:2010/BTNMT-national technical regulation about noise public areas and demographics;
- QCVN 27:2010/BTNMT-national technical regulation of vibration;
- QCVN 5:2013/BTNMT-national technical regulation on the quality of ambient air;
- QCVN 09-MT: 2015/BTNMT-national technical regulation on the quality of water under the Earth;
- QCVN 43:2017/BTNMT-national technical regulation on the quality of sediment;
- QCVN 03-MT: 2015/BTNMT of the allowable limit of some heavy metals in the soil;
- QCVN 08-MT: 2015/BTNMT-national technical regulation on the quality of surface water.

4.2. Policy safe social environment of the World Bank

MD-ICRSL project the World Bank is classified as Category A projects on the environment. According to the Environmental Management Framework and Social Affairs of the project, subprojects were screened on the environment with the following results:

- The screening validity: subproject is funded by project ICRSL.

- The impact, potential risks to the environment and social disadvantage primarily local properties, have very little impact is irreversible, and most of the mitigation measures can be designed easily . The negative impact of the restrictions can control and have established ESMP for the Sub-project.

The safety policy the World Bank is enabled in this subproject include:

- Environmental Assessment (OP 4:01).

According to OP 4.01, Environmental Assessment (EA) and the Management Plan Environmental and Social (ESMP) have been developed to identify and assess environmental impact and social potential adverse can happen during implementation of the project, on the basis that the proposed measures will be taken to prevent and minimize the environmental impact, strengthen the beneficial effects.

- Cultural assets, tangible (OP.4.11): A number of construction activities of the subproject will have an impact on a number of cultural facilities in the project area as Temple An Minh. Therefore ESMP will include a number of measures to minimize the impact of cultural property, objects.

- Natural Habitats (OP/BP 4:04): Some of the construction activities of the subproject will have an impact or pose a risk to the river and mangroves Cu Lao Dung. Therefore ESMP will include a number of measures to minimize the impact on the natural

habitat.

- Obligatory Resettlement (OP/BP 4.12): subprojects have conducted land acquisition, clearance, relocation and resettlement.
- Forests (OP/BP 4:36): Some livelihood activities will be conducted in the area Cu Lao Dung Mangroves.
- Ethnic minorities (OP/BP 4.10). Regional sub-projects have minority (Khmer) live.
- Pest Management (OP 4:09): subprojects have conducted provide supplies and other supplies for the livelihood models as veterinary medicine, aquaculture, plant protection, biochemical preparations to handle the environment aquaculture ponds.

Subprojectwill also comply with the requirements of the World Bank on public consultation and information disclosure.

Environmental Assessment Report society will also apply the Guidelines on safety health and environment of the World Bank "EHS Guidelines"

5. Organizations perform ESIA report:

Owner of the subproject is the Department of Agriculture and Agricultural Development in Soc Trang and units Trust Investor's **Project Management Unit 2, Soc Trang Province** has leases consulting unit is **Company share investment consultancy, Design construction and services Trade Nam Thien** report environmental impact assessment and social (ESIA) for the sub-projects:

- Represented by the consultant: **Do Tien Duong** Position:Director.
- Address: 57/3 Pham Thai Buong, Phu My Hung, Tan Phong Ward, District 7, HCMC. HCM
- Phone Number: 028.5412.3961 Fax: 028.5410.5777

Company share investment consultancy, Design construction and services Trade Nam Thien has 8 years experience in the field of EIA reports, reports the ESIA for the project, especially for projects in Delta Mekong river. Some reports highlight that the consultant has worked as the EIA report of the project: "Upgrading the infrastructure area of aquaculture biosecurity 3 My Xuyen District, Tran De and Cu Lao Dung, Soc Trang province "(projects WB) project" Infrastructure development of sustainable eco Tram Chim National park, Dong Thap province, project" Irrigation western region Vam Co Dong river",...

Table i. List members ESIA report

No	Name	Background	Assigned tasks
Represent the project			
1	Mai Phuoc Hung	Fisheries engineering	Responsible for the entire content of the report on environmental impact assessment
consultant			
1	Ho Tu Thu Phuong	PhD Environment	Manager reporting environmental impact assessment report-Synthesis
2	Do Tien Duong	Engineer Irrigation	Environmental impact assessment of the project on the irrigation project items
3	Vu Thi Ngoc My	Bachelor of Environmental	Organizations and community consultation
4	Pham Duc Tiep	Engineers building bridges	Assessing the impact on traffic works
5	Nguyen Thi Minh Chau	PhD Environment	Construction monitoring programs and environmental management
6	Do Tien Lanh	Associate Professor Dr / collaborators hydrological	propose measures to minimize environmental impact for stages
7	Tran Tong	Engineer Irrigation	The environmental impact of the project on the Economy - Society
8	Dao Quang Binh	Specialist social	Impact assessment of social projects

6. The methodology applied when performing ESIA

Methods of environmental impact assessment to be used in this ESIA report include:

6.1. Methods of environmental impact assessment

- *Methods for rapid assessment:* With the experience of the experts, in the process of surveying the field, even in geographical studies assessing the impact was made preliminary to some environmental factors such as ecological environment, economic environment - society ...

- *Comparison method:* Based on the survey results, measured in the field, the results of analysis in the laboratory and results calculated in accordance with compare theory with Vietnam standards to determine the quality of the environment in the area of project development.
- *Methods impact identifier:* This method is applied through the following specific steps: describing the environmental system; determine the components of the subproject affect the environment; and determine a full line of related waste, environmental issues to serve for a detailed assessment.
- *Enumeration method:* This method is based on the tabulation shows the relationship between the activities of the project with the environmental parameters potentially affected by the project aims to identify environmental impacts. A checklist is built good will cover all of the environmental issues of the project, allowing a preliminary assessment of the impact and direction of the most fundamental impact needs to be assessed in detail. For this method, there are two types of the most common listing includes simple listing and listing preliminary assessment of the impact.
- *The method of community consultation and disclosure of information:* Public consultation is used to help identify opportunities and risks, design enhancements and improved project execution, and increase ownership of the project and sustainability. Community consultation is required in the implementation of safety policies and social environment of the World Bank. This is a two-way process in which the beneficiary feedback and provide information input to the design of the subprojects that affect their lives and their environment, to promote dialogue between the main government, communities, NGOs and other implementing agencies to discuss all aspects of the proposed subproject. The feedback from the consultation will be included in the report ESIA and design of subprojects.

The influence of the subprojects including those being resettled and those in nearby communities affected by subproject, who benefited from the project, local NGOs, mass organizations , including women, local, Central and local authorities, donors and other development agencies, and other stakeholders.

Public information about the project including the safety policy document enabling the community access to information about the environmental and social aspects of the project. A Vietnamese security policy documents of the project will be public in the project area, and the English version will also be posted on the website of the WB.

6.2. Other methods

- *Method of inheritance, collect, aggregate documents and data:* This method is used to determine and assess the condition of natural and socio-economic development of the subproject through the data and information collected from various sources such as statistical yearbooks, reports regional socio-economic, environmental studies and

databases involved in the region. At the same time, inheritance studies and reports available is really necessary to use the results available to identify missing information, and deploy operational implementation of the content of consultancy services.

- *Methods of investigation, field survey:* The survey, field work is work required during the implementation of ESIA/EIA to determine the status of the sub-project, the surrounding objects associated important to select the location of sampling, surveys the current state of the natural environment, climate, hydrology, land use, vegetation, fauna and flora in the area subprojects. The survey results will be used to assess the natural conditions of regional subprojects.
- *Expert method:* Based on the knowledge and experience in the field of environment, the experts of the consulting unit along with other experts will discuss and agree on the results in the implementation process ESIA.
- Methods of taking and analyzing samples: To implement environmental sampling of soil, water, air and aquatic, measurement parameters in the field, storage and transport of samples to the laboratory and analyzed samples in a laboratory in accordance with the provisions on the measurement and monitoring of the environmental quality of the Ministry of Natural Resources and environment:
  + Environmental monitoring air Circular 28/2011-BTNMT 01/8/2011;
  + Environmental monitoring water Circular 29/2011-BTNMT 01/8/2011;
  + Monitoring groundwater samples Circular 30/2011-BTNMT 01/8/2011;
  + Environmental monitoring of soil and sediment according to Circular 33/2011-BTNMT 01/8/2011.

CHAPTER 1: SUBPROJECT DESCRIPTION

1.1. Subproject name:

Subproject No.7: "Investing in infrastructure construction for production conversion in accordance with ecological conditions, improving livelihoods to adapt to climate change in Cu Lao Dung area".

1.2. Investor:

Investor: Department of Agriculture and Rural Development of Soc Trang provice

Fiduciary investors: Project Management Unit 2 Soc Trang (PMU 2)

- Representative: Mai Phuoc Hung Position: Director
- Address: No.79A Nguyen Chi Thanh street, Ward 6, Soc Trang City, Soc Trang Province
- Telephone: 029.93.620.798

1.3. Places project implementation.

Soc Trang is located downstream of the Hau River, where the Hau River flowing into the East Sea in two Dinh An and Tran De, population and area are ranked 6th in the Mekong Delta.

Subprojects will be done on Cu Lao Dung district, Soc Trang province. Subproject area of the Mekong Delta, Ho Chi Minh City and 231 km, 62 km from Can Tho.

Boundaries are defined subprojects as follows:

(i) West - North : contiguous with My Phuoc island.

(ii) The East – North : East Sea.

(iii) East – North : contiguous Dinh An estuary.

(iv) The West – South : contiguous Tran De estuary.

Location subprojects area shown in Figure 1.1

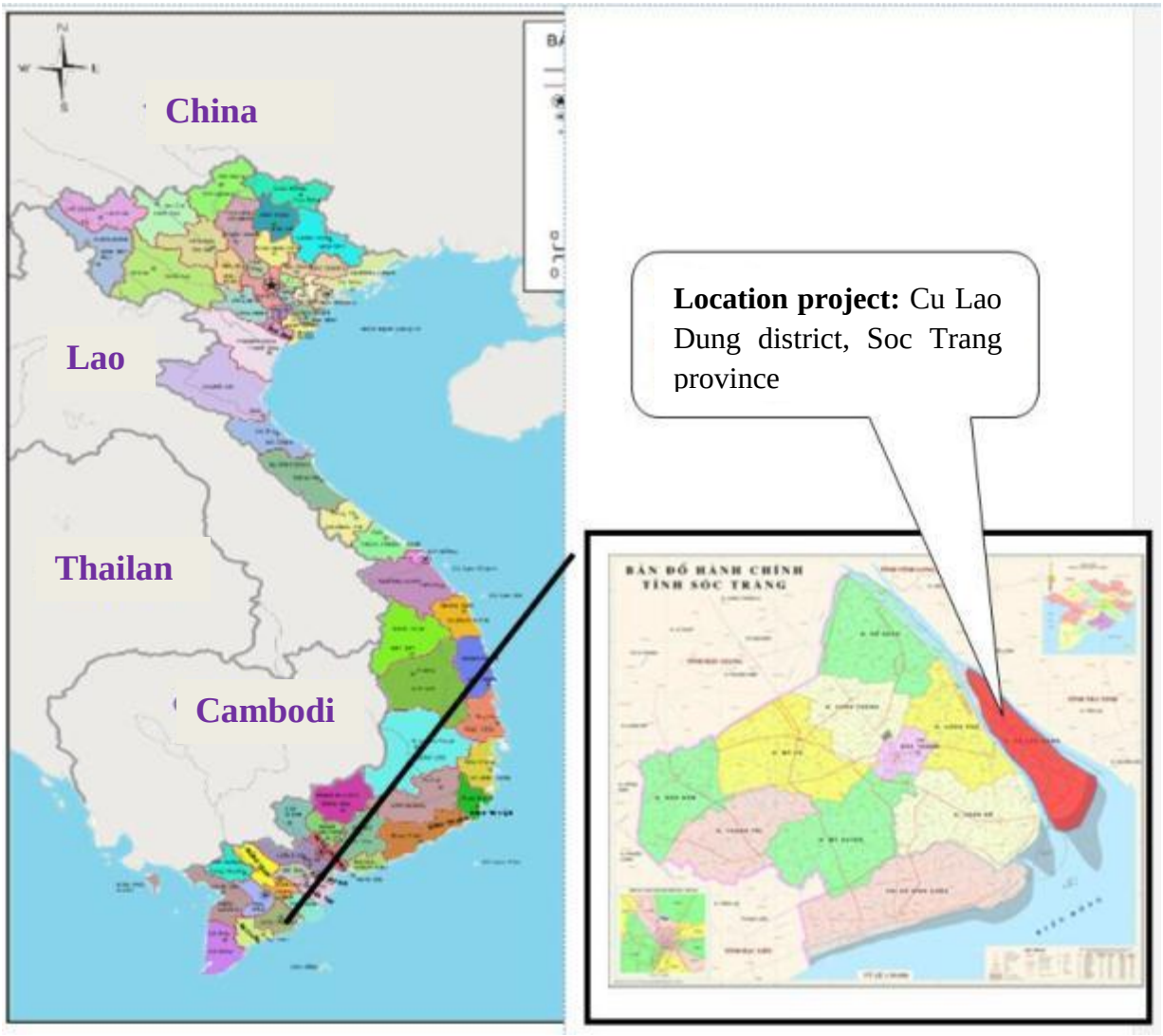


Figure 1. 1. Location project

1.4. Scope of investment:

1.4.1. Goal, purpose

❖ **The goal of subproject**

Investments projects to serve the conversion produced in accordance with ecological conditions, to adapt to climate change and improve the livelihoods of people depolarization Cu Lao Dung based promotion the advantages and potentials of the region.

❖ **Objective of the ESIA report**

Report ESIA is built to ensure subprojects have a plan and a process for hard, avoid or reduce to the minimum and/or take measures to minimize negative impacts on the environment as well as social investment activities and interventions of the project as they are identified, planned and implemented. Subproject is graded B for environmental

assessment in accordance with OP/BP 4:01. This report includes measures, mitigation plans, and/or cope with the negative impacts and enhance positive impacts, the tool estimates and budgeting for these measures, inform about bodies and organizations responsible for addressing the impact of the project. Reporting environmental impact assessment and society is built in compliance with the instructions in the framework of Environmental Management and Social Affairs, the project, based on the study of laws and regulations related to the Government's as well as reports and various documents related to environmental conditions and society at local, field survey and held meetings with local authorities and local people, by the Project Management Unit 2 Soc Trang province carried out under the support of local consultants.

❖ **The scope of the ESIA report**

Based on the guidelines prepared in the framework report ESMP, the contents of the ESMP include: Introduction; Legal framework, Brief description of the subproject (Chapter 1); Natural conditions, economic, social (Chapter 2); Environmental impact assessment and society (Chapter 3); Analyzing and comparing how the plan (Chapter 4 - Although this chapter does not require but a minor project to put into practice the good way), Mitigation measures (Chapter 5); Management plan and social environment (Chapter 6); Community consultation and disclosure (Chapter 7). In addition, there are other ESIA addendum: EIA approval decision (Appendix 1), results of the analysis (Appendix 2); Minutes of interdisciplinary meetings and consultation meetings (Appdendix 3), sample map (Appendix 4).

1.4.2. Investment scope

Project categories include:

- Upgrade of sea dike:
  + Consolidate and upgrade the 22.454 km of sea dikes to prevent intrusion tide. Scale B= 7.5m, crest level + 3,90m.
  + Investment in building some new buildings on the sea dike culverts and bridges (01 sewers, 08 sluices, 01 bridges)
  + 7 Upgrade sewer, 7 bridge the current state on dikes.
- New construction of river dykes Con Tron and Ben Ba:
  + New construction 39.892 km of river dykes. Size = 3.0 m B, Elevation of + 3,20m.
  + Building 04 new undergroud sewers, 37 sluices and 46 earth dams on dikes.
- Upgrading the provincial road 933B: The length of 21,827 km, the road surface B = 7.0 m and build 09 new bridges on the route to replace the existing bridges;
- Renovate and build a new electricity system for production: renovate and build 16,696 km of medium-voltage and 19,916 km of low voltage lines and 12 transformer stations

in the district.

- Restoring coastal mangrove forests.
- Converting production in accordance with natural conditions and adapting to climate change and sea level rise.

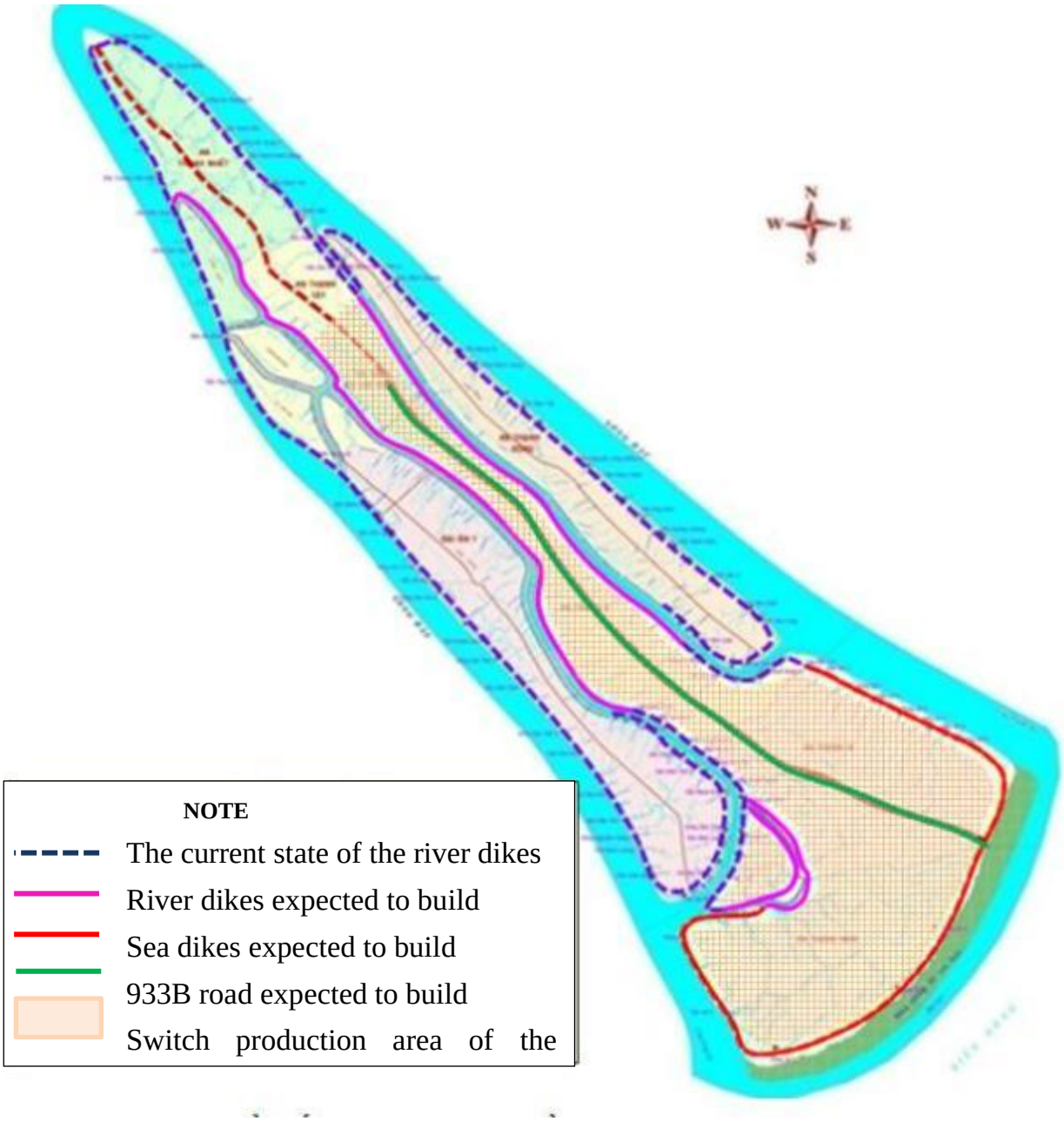
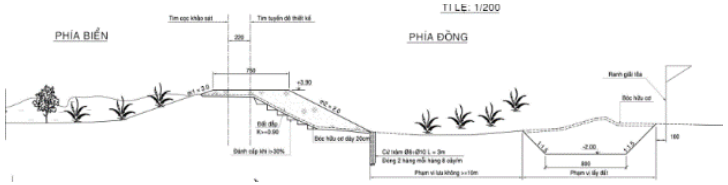
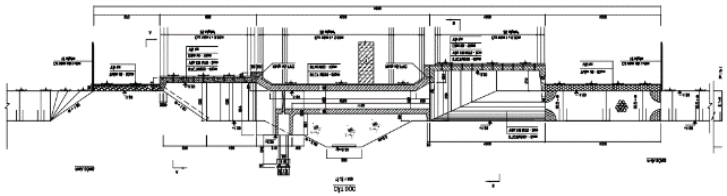
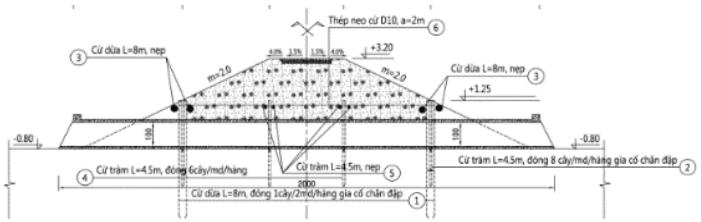
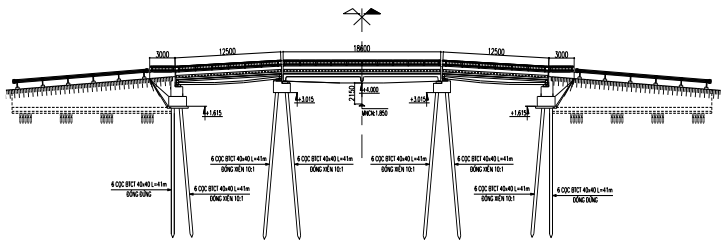


Figure 1. 2.. Project layout map

The project items are detailed in the table below:

Table 1. 1. The categories of projects

Activity Name	Specifications Basic	Sectional Drawing
I. Construction of technical infrastructure to serve and protect convert production		
I.1. Upgrade of sea dike *(Building III)*		
Upgrade of sea dike	Sea dykes exist degraded, failing to meet the conditions of climate change due to lack of some works should dikes not promote efficiency. Subproject will upgrade 22.454 km sea dyke (from Mu U to Rach Ngay) from crest level + 3m width dike B = 5-6 m high crest + 3,90m, B = 7.5m. Preserving the dike: $m_{outside}$ = 3, m_{inside} = 2. Line of sea dikes are earthen embankment pressure extraction structures in place. To demand for traffic, the surface will be utilized dike roads by placing on the dike of concrete plates (B = 3,50m, thickness 18cm), 2 sides is about saving not (2m).	 *Figure 1. 3. The status of sea dikes*
Upgrading culverts, existing bridges	Existing bridges and culverts across transportation sea dikes remain active basically just damaged some parts, but not appropriate when upgrading dikes. Therefore, subproject will: + Raise the top of the wall, repairing and upgrading the face and road batters in 07 sluice gates to the design elevation, + Upgrade path to 07 bridges to connect matching highly recommended upgrade process.	 *Figure 1. 4. Sea dyke cross section*
Investment in building some new works on	The subproject will build a new underground sewer with size B x H = 1.5x1.5m, Lc = 25,0m, ∇đc = -1.50m at Suon canal.	 *Figure 1. 5. Cross section along underground*

the sea dike culverts, bridges	A number of canals on the dyke should be arranged with sluice gates because they were previously welded by earth dams, without access flow leading to sedimentation and environmental pollution (this phenomenon only occurs on sea dykes due to the canals long). The subproject owner will construct 08 new culverts of size B x H = 1,0x1,0, Lc = 40,0m, đc = -1,00m at Ong Nam canal, Ong Bay canal, Khem canal, Sau canal, Choi canal and Thai Lan canal (2 culverts on 2 sides). The one-side sluices face the field, one side faces the sea (both types of sewers). Subproject will build a new traffic bridge at Ao Vuong Thai Lan canal (K14 + 020). The bridge structure construction drawing, 3 beats (12.5 + 12.5 + 18.6) m, L = 45 m, B = 3, 50 m.	*sewer on sea dike*  *Figure 1. 6. Structural sluices on the sea dike*  *Figure 1. 7. Structure of traffic bridge on sea dike*

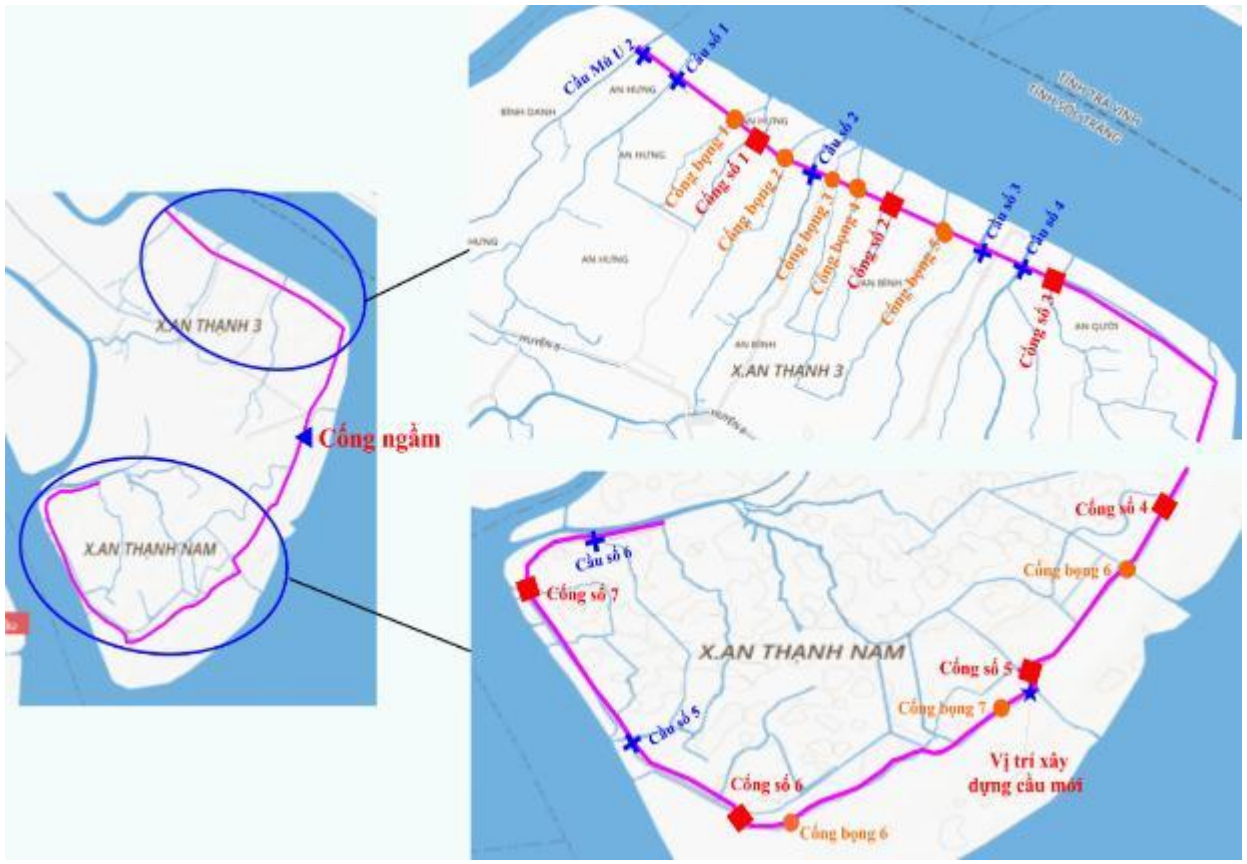
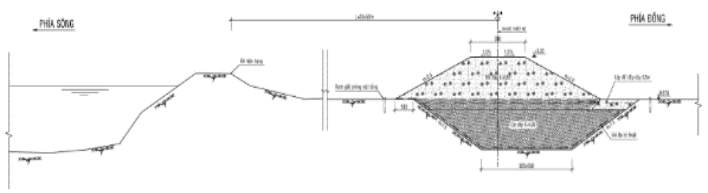
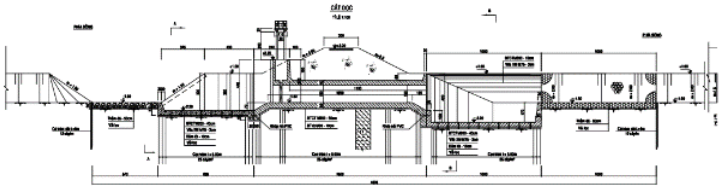
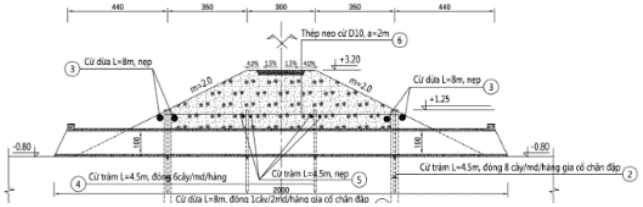


Figure 1. 8. Arrangement of river dike construction

I.2. New construction of river dykes Con Tron and Ben Ba

New construction of river dykes Con Tron and Ben Ba	Tributaries currently no levees, embankments so only the people themselves built annually always potential risks of flooding caused by broken embankments. Subprojects will build 39.892 km of river dikes (structures made of earth) with B = 3.0 m, elevation peaks + 3,20m, dike coefficient: $m_{in} = m_{out} = 2.0$, divided into 4 sections: Ben Ba River Dyke 11.242 km long (from the intersection of Long An canal and	

	Hau river to Ba Ca bridge),Vam Ho Lon - the left bank 5,012km long (from Vam Ho Nho head through Voi canal to Rach Rach bridge),) Vam Ho Lon - the banks have long 4.116 km (from the beginning of the Vam Ho Nho to the position opposite the bridge canal soon, to survive Round - RG - LA length 19.522 km (from Tu canal to Ngay canal).	, *Figure 1. 9. Structural river dikes*
Building land for new dams, sewers, sluices on river dikes	To proactively take water, drainage, flood prevention, water quality in exchange for each passenger on the entire range of the benefit of river works, The subproject will build 46 new earth dams at the beginning of some existing ditches, 4 underground culverts and 37 sewers. - Earth dams are located in small canals that are no longer used for circulation, forming a closed area. The earth dam has a width of 3.0m, a structure of embankment K = 0,9, the foot of the dam reinforces the Melaleuca poles, and the dam roof reinforces the coconut piles. Length of the dam: changes with the length of the incision. Investors will arrange appropriate drainage location not to cause flooding due to blocked line slitting line (earth dam) to form one cell area pouch closed. - Building 4 new underground sewers of size B x H = 1.50m 50 1.50m, length of culvert body is 15.0m, elevation of culvert bottom is -1.50m. One side faces the field, one side faces the river. - 38 culverts with size B x H = 1.0m x 1.0m, length of culvert body is 20.0m, elevation of culvert bottom is -1.00m, One side faces the field, one side faces the river.	 *Figure 1. 10. Cut along underground sewers on river dikes*  *Figure 1. 11. Structure of slurry culverts on river dikes*

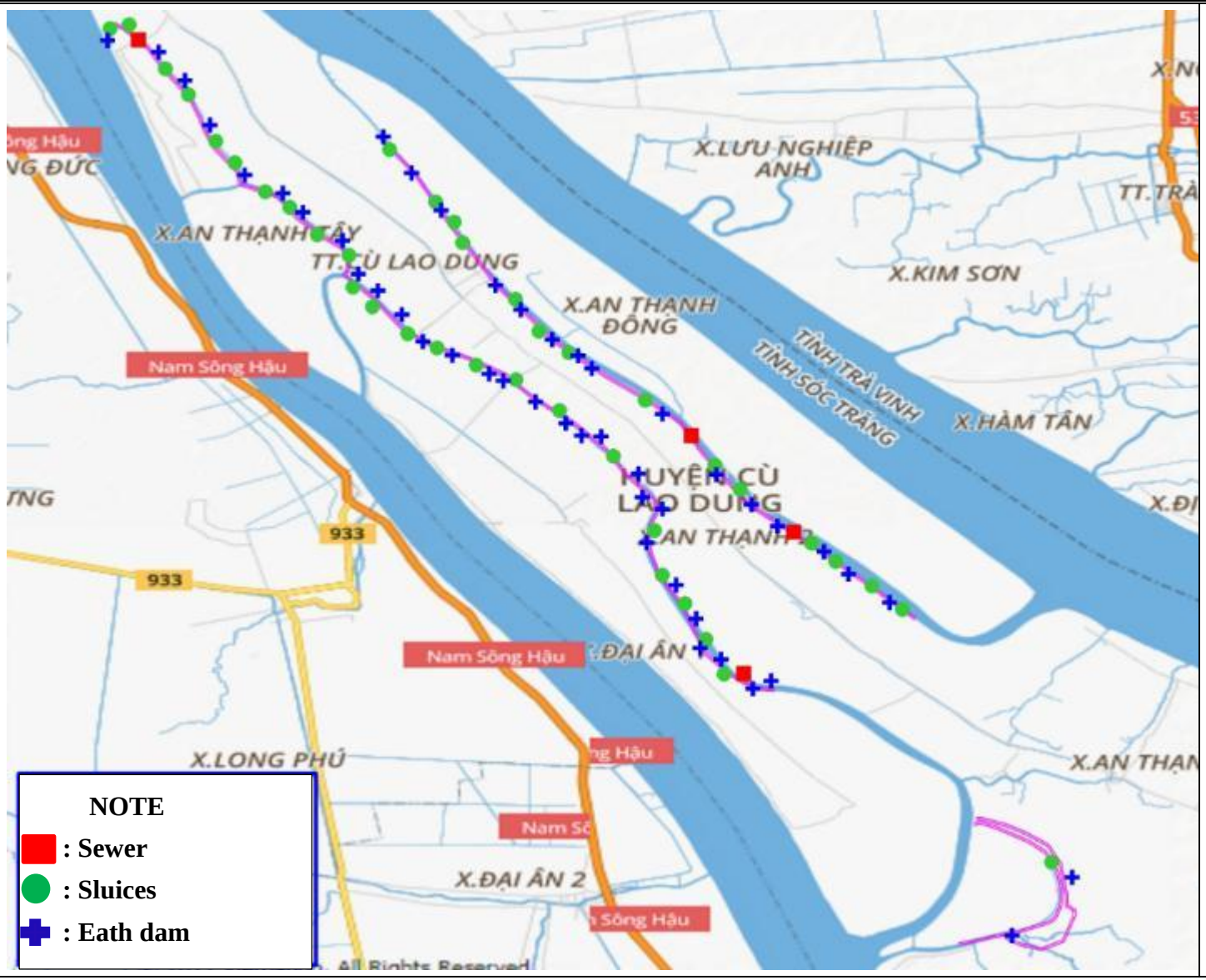


Figure 1. 12. Arrangement of river dike construction.

I.3. Upgrading the provincial road 933B

Upgrading the provincial road 933B

Road 933B is the arterial roads of Cu Lao Dung with a length of about 33km, but now the road is too small, degraded, circulation minimize 16 seats one direction causing difficulty in transporting goods, movement of people.

Sub-project will upgrade 21,828km of road 933B from B = 5m to 5.5 - 7m, elevation from +1.9 - + 3.3m to +2.8 - + 3.4m (highest difference in paragraph 4 and paragraph 6 from 0,7 - 0.8m), the design speed is 40-60 (km/h).

Plans to upgrade the route is divided into 7 sections, which, in paragraph 7 is slitting line to avoid the Rach Trang market. In the town area, has arranged tree planting and construction of rainwater drainage systems D400-D600 2 roadside. In the area Rach Trang market (paragraph 5) arranged new construction rainwater drainage system D400-D600 2 roadside. The size of each segment is presented in the following table specific:

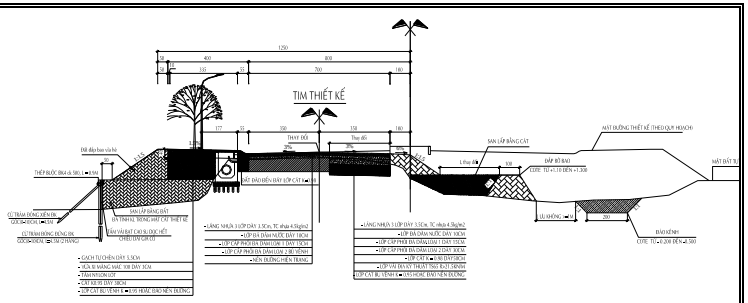
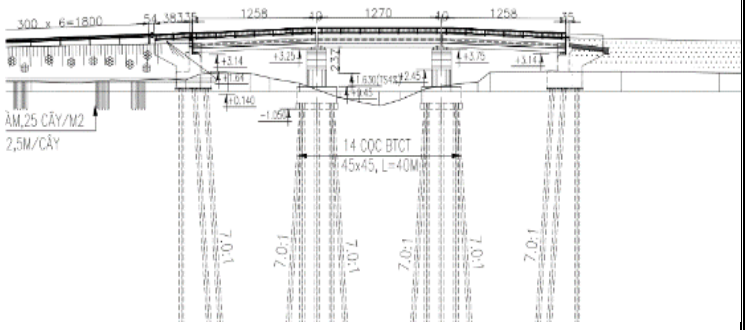


Figure 1. 13. Cross section representing the route

Paragraph name (1)	**Length (2)**	**Road surface width (3)**	**Curb width or sidewalk (4)**	**(1)**	**(2)**	**(3)**	**(4)**
Paragraph 3: km9+974 - km11+854	1.879	3,50 x 2 = 7,0	1x4,0+1x (1,0+0,5)	**Paragraph 6:** km26+71 - km30+23	3.515	3,50 x 2 = 7,0	2x1,0
Paragraph 4: km11+854 - km25+550	13.695	3,50 x 2 = 7,0	2x1,0	**Paragraph 7 (route to avoid):**	1.570	3,50 x 2 = 7,0	2x1,0

	Paragraph 5: Từ km25+550 to km26+719	1.169	2, 5 x 2 = 5,5	2x1,15	starting from km25 + 550 of the existing route going around Trang market and ending at km26 + 719 of the existing line.			
Newly built 09 bridges on the route to replace the existing bridges.	Currently, the bridges on the road 933B (9 bridges) are weak and narrow, with small loads and low static levels affecting waterway and road traffic of people. The investor will build 09 new bridges (at the position of existing bridges) with the preliminary parameters presented in the following table:				 *Figure 1. 14. Vertical cutting represents traffic bridge*		

Unit: m

Bridge name	Justice process	Traffic level		Bridge length	Width	Bridge name	Justice process	Traffic level		Bridge length	Width
		B	H					B	H		
Rach Vuot bridge	Km3+02	8	1,8	37,5	9	Rach Ngay bridge	Km20+ 39	8	1,8	3,5	9
Rach Dinh Tru bridge	Km12+25	13	2,9	43,6		Ba Keo bridge	Km21+ 998	8	2,3	3,5	
Rach Day bridge	Km17+276	8	2,3	37,5		Rach Dui bridge	Km28+ 640.69	20	2,9	73,62	
Rach Lon bridge	Km17+808	8	2,3	37,5		Rach Trang bridge	Km0+5 30 (route to void)	20	2,9	61,4	
Rach Ba Chu bridge	Km18+35	8	2,3	37,5							

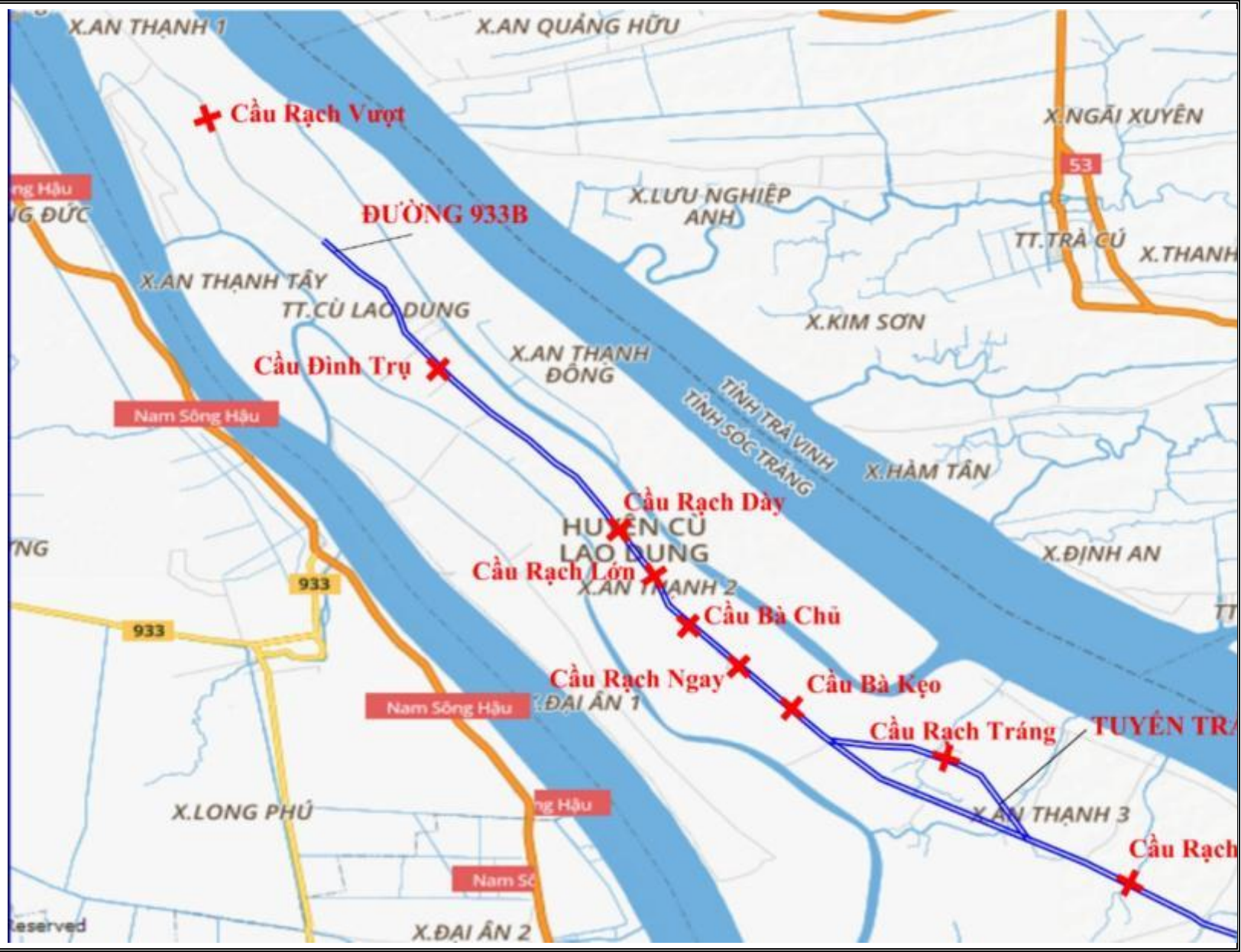


Figure 1. 15. Arrangement of route 933B

I.4. Renovate and build 16,696 km of medium-voltage and 19,916 km of low voltage lines and 12 transformer stations in the district.	
Renovating and upgrading medium voltage lines	Improving and upgrading 1-phase medium-voltage lines of 12.7KV to 3 phases of 22KV - An Thạnh 2 commune: MU U branch (2,216.7m), Nguyen Van Nha branch (818m), Rach Ngay 2 branch (1,053.5m). - An Thạnh 3 Commune: Rach Ruot Ngua branch to Rach Choi station (1,748.3m). - An Thanh Dong commune: Vam Tac 3 branch (535,5m), Vam Tac 4 branch (1,119.3m).
New construction of medium voltage lines	New construction 3-phase medium-voltage transmission line of 22KV, total length: 9204.5 m: The width of electric safety corridor on each side is 2m. - An Thanh 2 commune: Mu U 4 branch is connected to the existing Mu U branch (358.5m), the Mu U branch 5 (480 m). - Dai An 1 commune: Sau Thu canal branch (720m), Chu Dai canal branch (1,460 m), branch 10 Kinh - Con Tron (560 m). - An Thanh Nam commune: Region 7 branch (along the left side of the internal canal of Thanh Van hamlet) (925 m), Cống Sau Doi branch (along the left side of the channel, National Defense theme from Cống 4 to Kênh Sau Doi) (845 m), Quoc Phong dike branch (along the right side of the canal from Cong 4) (1,262 m). - An Thanh 3 commune: Rach Lon 1 branch (along the left side of the road in An Nghiep hamlet (416 m), Rach Lon 2 branch (medium voltage line intersects Vam Ho Lon canal of An Nghiep hamlet) (117 m) , Rach Choi branch (medium voltage line intersects Rach Ruot Ngua in An Binh hamlet) (803 m). - An Thanh Dong commune: Vam Tac branch - WB9 (along the left side of the road) (1,258 m).
Renovating and upgrading low voltage lines	Renovate and upgrade 1-phase low-voltage 3-wire line to 3-phase 4-wire (ABC 4x120mm2 cable), total length of 6.416m at the following locations: - An Thanh 2 commune: Mu U1 station (864m), Mu U2 station (954m), Mu U3 station (1120.3m), Mu U4 station (1,332.3m), Ngay 2 canal station (1053.5m). - An Thanh Dong commune: Ong Xuan station (852m). - Dai An Commune 1: Ong Hai canal Station (240m)
New	New construction of 3-phase 4-line low voltage line (ABC 4x120mm2 cable)

construction Low voltage line	14,627.8m at the following locations: - An Thanh 2 commune: Mu U5 station (1,332,3m), Rach Ngay 3 station (1,059.5m), Area 7 station - WB9 (1,038m). - An Thạnh Nam commune: Sau Doi sewer station (1,140m), 4 sewer station – Quoc Phong dike (1,140m). - An Thanh Dong commune: Vam Tac station (1,193m), An Binh station (934m). - Dai An Commune 1: Chu Dai Station 1 (922 m), Rach Chu Dai 2 Station (1,085 m), Rach Sau Nghi Station (1,080m), Muoi Kinh Station - Con Tron (750 m). - An Thanh 3 commune: Rach Choi station - WB9 (1,046m), Rach Choi station - WB9 (210m), Rach Lon 1 station (528m), Rach Lon 2 station (1,080m)	*Figure 1. 16. Transformer station 150 Kva*
New construction of transformer station	Constructing 12 new 160kVA substations, 1 cylindrical station with an area of 16m^2, 2-cylinder station with an area of 24 m^2. - An Thanh commune 2: 02 stations 1x160kVA, total capacity: 320KVA. - An Thanh commune 3: 03 1x160kVA stations, total capacity: 480KVA. - An Thanh Nam Commune: 02 stations 1x160kVA, total capacity: 320KVA. - An Thanh Dong commune: 02 stations 1x160kVA, total capacity: 320KVA. - Dai An commune 1: 03 1x160KVA stations, total capacity of 480KVA	
II Planting and rehabilitating coastal submerged forests		
Planting and rehabilitating mangrove forests	At present, the mangrove forest area from Mui Dau So to the No. 4 sewer area is about 2.50 km in length, thin forest and thin forest belt. In order to protect the sea dike line before the wind wave, additional planting of about 40.0 ha in this area is required. The plants are planted with a height of ≥1 m; 11-18 months old.	

Figure 1.16. Location of afforestation

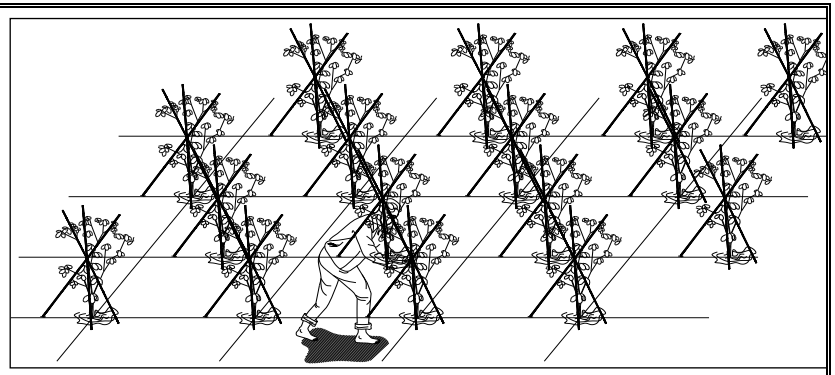


Figure 1. 17. Arrangement of forest planting space

III Convert production in accordance with natural conditions and adapt to climate change and sea level rise

Currently, agricultural production of Cu Lao Dung district is divided into 3 areas: sweet production area (the area at the top of Cu Lao Dung) planting fruit trees, growing and sugarcane; Saline production areas (between Cu Lao Dung) planting sugarcane and crops, Saline production area (at the tail of Cu Lao Dung) inside the dyke for aquaculture, external mudflats mangroves grow clam.

Climate change and sea level rise are a challenge for Cu Lao Dung if the current agricultural and farming systems are maintained.

When investing in production conversion, freshwater aquatic species, sugarcane area and species are not saline, instead increasing the presence and strong development of marine and brackish water species such as prawn..., species of fruit-bearing plants with high commercial value such as Coconut, Custard, Dragon fruit, Sapo, Longan ...

The infield system of water supply and drainage canals for the planned areas has been invested in 2016-2017, so when building these models, there is no need to invest more in-field systems.

No	Grave name	scale (ha/point)	Location to build the pilot model	Expected scale
1	Model 1: Aquaculture combin Geloina coaxans es and Cerithidea obtusa under dozen mangroves	05 ha	Mangrove forests outside the sea dike: from Mui Dau So to Ao Vuong Thai Lan sewer (An Thanh 3 and An Thanh Nam)	350 ha
2	Model 2: Raising Penaeus monodon under the canopy of forest planted in the buffer zone along the dyke.	03 ha	Inner buffer zone along the sea dyke in the area of sewer Dau So canal (An Thanh III) to culvert No.6 (An Thanh Nam)	100 ha
3	Model 3: Raising Penaeus monodon and Litopenaeus vannamei according to VietGAP	20 ha	An Thanh Nam Commune: 3 sub-zones An Thanh III commune: 3 sub-zones Dai An Commune I: 3 sub-zones	500 ha
4	Model 4: Raise Penaeus monodon in combination with Mugilidae, Tilapia in the pond system (Two models are interwoven).	20 ha		3.000 ha
5	Model 5: Raising Pseudapocryptes elongatus intensive in earthen ponds	05 ha	Dai An I commune: 3sub-zones An Thanh II commune: 3 sub-zones An Thanh Dong: 3 sub-zones	200 ha
6	Model 6: Planting salty-bearing fruit trees (coconut, fruit custard and Dragon fruit) towards developing agro-ecological tourism in coastal areas. (These two models are arranged in combination with sustainable agricultural systems of household size (VAC-	10 ha	Cu Lao Dung Town: 3 sub-zones; Dai An Commune I: 3 sub-zones; An Thanh Dong commune: 3 sub-zones; An Thanh III commune: 3 sub-zones; An Thanh Commune II: 3 sub-zones	200 ha

	B))			
7	Breeding in the direction of biosecurity (beef, goat, garden poultry,...)	23 point	Communes in region 1 and 2	200 point

1.5. Measures to organize construction, construction technology

1.5.1. Construction methods of dykes

❖ ***Construction of sea dike***

Step 1: Use scraper (0.8 - 1.25m^3) to dig the soil inside or outside the dike line (create drainage canal). Pour the soil into the storage area (5 ÷ 10 m) and part of the dyke.

Step 2: Use a motorized excavator to transfer soil from the storage area to the dyke body after the soil has been dried.

Step 3: With the dike sections needing no transshipment: Use bulldozer 110 CV to dike the dyke to create the dike roof, the height of the dike crest is designed (construction 1 time). With the sections of dykes that need to transfer land, step 3 is divided into 2 construction phases:

- Phase 1: Leveling the dyke body with the amount of soil available in the dyke body during construction step 1.
- Phase 2: Sanitize the dyke to create the dyke roof according to the design section after finishing construction step 2.

❖ ***Contruction of th river dike***

Step 1: Use excavators (0.8-1.25m^3) to excavate the ground of the construction area to dump the soil to one side, then spread the filter cloth into the excavation chamber and pump the sand to level.

Step 2: Use excavators to combine a bulldozer to fill the dike body which has been sanded and lowered.

Step 3: Do the same Step 1 for the other side of the dyke.

Step 4: Do the same as Step 2 for the rest of the embankment.

Step 5: Sanitize the dyke to create the dike roof according to the design section after finishing construction step 2 and step 4.

1.5.2. Construction methods

❖ ***Construction of underground sewers***

The sewers are set on the current state of slit thus to construction are to dykes crank upper lower drain.

Step 1: Dig foundations by digging machines combine manually.

Step 2: Execute channel upper lower drain: Use retrieve the motor Earth packed the banks of the Canal, using lines such as digging foundations.

Step 3: Building back the single slices of raw sewage.

Step 4: Bring up the drain: Used bulldozer moved soil to embankment locations, then compacted by manually.

❖ ***Contruction of sluices***

The body of the culvert is constructed on land. Excavate the foundation pit, bring down the body in the right position with a digging machine or a specialized crane.

1.5.3. Measures for construction of traffic bridges

Step 1: Prepare the ground, locate and close piles to handle the foundation of abutments, abutments.

Step 2: Handling pit (excavating foundation pit, sucking mud layer ...), erecting reinforcement, formwork, concreting the abutments and pillars.

Step 3: When the pillars reach the designed intensity, they can install the girder, then erect the reinforcement, formwork concrete deck. For spans using cantilever girders, installation of equipment for cantilever casting is carried out, casting spans starting from the pillar.

Step 4: Completing the bridge: construction of railing, joints of the spans, structure of the water surface drainage.

1.5.4. Measures for road construction

- Locate the heart to spread detailed piles; Clearing construction sites, building camps;
- New construction route: Scouring mud, digging roadbeds, spreading geotextile, changing sand; The route takes advantage of the old road surface: Cleaning the old road surface (using blowers);
- Clay for roadbeds;
- Construction of seams (if any); Construction of road and pavement structures;
- Installation of lighting systems and trees in the town area; Installation of signpost pile system, corrugated iron fence;
- Finishing works.

1.5.5. Measures for afforestation

The seedlings selected are seedlings that are incubated in Polylenic pots, plant height: greater than or equal to 1 meter, diameter of root collar: greater than or equal to 1.5 cm, age of seedlings planted: 11-18 months old. Plant density is 2,000 plants / ha. Planting season: from May to October.

Before planting to positioning planted between plants of 2m, 2.5m rows, staggered formation crocodile fangs. Seedlings before planting to cutting down the tops young. Using hoes and shovels digging planting soil enough to put the tree in, avoid digging too big loss of land surrounding texture tree facilitate voting favorable to wave to shake the tree. Tear shell gourd put trees in pits, keep the tree in an upright position and proceed to fill all the mud around the crater, compacted soil around to keep the tree stand (attention not to break or damage roots).

Using bamboo 3 with 2-3 cm diameter, 1.5 m long, tapered plug 45^0 are inclined form around tree tripod, use nylon rope to tie the tree to the third try the pile (The pile key to 10cm just enough to tie a tree). Pile plug 1m deep, well-0.5m. Planting: Check assessment locate dead tree, planting forest plants died to ensure the design density ratio of 15% is expected planting the main crop. For new plantations: Check care from the 2nd month of the first year onwards to ensure forest, all conditions well-developed plant growth.

1.5.6. Electrical construction

- Transporting pillars and materials from Soc Trang Power Company to the project.
- Conduct digging holes with wool, fold and erect pillars by design. When it is prevented from tilting, it is unsafe and difficult to adjust after the ground foundation is hardened.
- Pull the rope

1.5.7. Implematation of livelihood model

Investment in pilot production models: Each model of the participant model is supported 100% of the cost of seed (seedlings, seedlings) and 30% of other material costs (food, fertilizer, medicine) veterinary, aquatic products, plant protection, improving ditches, breeding facilities, ... according to technical processes and standards).

Improve capacity for production conversion: Capacity building activities are carried out in two areas: (1) Technical knowledge applied in the model and production transformation; (2) Skills to mobilize the establishment and administration of community groups, production cooperation groups, agricultural cooperatives and contractual cooperation, product consumption cooperation in the agricultural value chain:

Establishment and support of production organizations: To organize and link production towards a focus in the project is expected to form and enhance the capacity of cooperatives of production organizations for multiplying regions wide conversion production. Cooperative groups depend on the type and object of production with scale of about 50 - 300ha. The contents of implementing capacity building for cooperatives: Propagating and training Cooperative Law in 2012; Improve the capacity of cooperative human resources; Policies to support the establishment of new cooperatives, Organize study tours within and outside the province.

Gender equality issues and ethnic policy in the project

To ensure social issues of equality (gender, ethnic minorities), some issues of capacity building in the project are as follows:

- Training on knowledge of gender equality, household economic management, organization of family life and reproductive health care. At least 40% of women join.
- Prioritize to encourage women and ethnic people to attend training courses on (1). Technical

knowledge applied in modeling and production transformation; (2). Skills to mobilize the establishment and operation of community groups, production cooperatives, agricultural cooperatives and contractual cooperation, product consumption cooperation in the agricultural value chain (details below). At least 30% of women are involved.

- Prioritize the construction of a pilot demonstration for households headed women, single women, ethnic minority families. Targets 30% of the selected family.
- Coordinate with the Women's Union at all levels (district/village/hamlet, village) community training group dedicated to women with size 30/class. Estimated 30% of the students are women are involved in training when the project ends.
- Coordinate with the Office of Ethnic districts/Unit Ethnic group training social community dedicated to ethnic Khmer (4662 person /equivalent 1,000 households, Statistical Yearbook 2016). Proposed 30% of households in the project area to attend the training.

Table 1. 2. Statistical operations performed capacity building in the model

No	Activity name	Unit	Amount
I	**Technical support**		
1	Training (FFS) technical process for farmers	class	14
2	Technical staff visiting and consulting the model	person	14
3	Support certification of aquaculture VietGAP model	model	3
4	Study tour to share experiences of applying techniques in and outside the province	time	3
5	Technical workshop to expand the application of effective livelihood models	time	14
6	Review of additional livelihood models to improve the application process	time	7
II	**Establishing, operating, maintaining activities of cooperative groups / cooperatives associated with production consumption**	**Group**	**30**
1	Associated team to produce Geloina coaxans and Cerithidea obtusa under the mangrove canopy	Group	2
2	The association of shrimp farming production under the forest canopy in the buffer zone along the dyke	Group	2
3	Associated group of brackish water fish production	Group	10

4	VietGAP shrimp farming association	Group	10
5	The VAC-B production association is associated with agricultural ecotourism services		6
III	**Communication activities**		
1	Information on newspapers, Radio and Television Station, Electronic Portal	year	5
2	Forum, talks to directly exchange farmers, businesses, scientists and managers	time	4
3	Competition for farmers to adapt climate change in Cu Lao Dung	time	2

Source: Main report of the subproject, 2018

1.6. List of machinery, equipment and personnel:

1.6.1. List of machinery, equipment

The list of machinery and equipment used in the construction of construction items is listed in detail in the following table:

Table 1. 3. List of machinery and equipment for construction work

No	Name of construction machine	Technical specifications	The number of machines
1	Excavator of a bucket, crawler	0.40 m^3 bucket capacity	2
2	Excavator of a bucket, crawler	0.65 m^3 bucket capacity	4
3	Excavator of a bucket, crawler	0.80 m^3 bucket capacity	1
4	Self-propelled steel dam	Weight 8.50 T	4
5	Self-propelled steamed cake	Weight 9.0 T	3
6	Self-propelled steamed cake	Weight 16,0 T	1
7	Self-propelled steel dam	Weight 10.0 T	1
8	Self-propelled vibrator	Weight 25T	1
9	Concrete compactors, table compaction	1.0 kw capacity	1
10	Concrete compacting machine, beam puncher	1.5 kW capacity	1

No	Name of construction machine	Technical specifications	The number of machines
11	Bulldozers	108.0 CV Capacity	2
12	Bulldozers	110.0 CV Capacity	1
13	Crawler crane	Lifting capacity 25,0 T	3
14	Air compressor, diesel engine	360.00 m3 / h Capacity	3
15	Plastic watering machine	-	1
16	Plastic cooking pot	-	1
17	Car watering	5.0 m3 Capacity	1
18	Macadam gravel dispersing machine	Productivity 60 m3 / h	1
19	Diesel engine water pump	120CV Capacity	2
20	Diesel engine sand pump	480CV Capacity	2
21	Boat (boat) placed pump	Weight 40T	2
22	Concrete mixer	Capacity of 250.0 liters	3
23	YHK 10A line drawing equipment	-	1
24	YHK 3A paint stove	-	1
25	Rebar bending machine	5.0 kW capacity	3
26	Floating pile hammer	Weight of hammer <= 2.5 T	1
27	Car transport container	Weight 5 T	1
28	Car transport container	Weight 2.5 T	2
29	Lighter	Weight 250,0 T	2
Total			52

Source: Main report of the subproject, 2018

1.6.2. Manpower needs:

The number of employees during the construction of the subproject is summarized in the following table:

Table 1. 4. Summary of labor numbers (at the time of highest construction intensity)

Categories	Sea dike	River dike	Upgrade the road	Electrical construction	Total
Worker	45	95	60	50	**250**

The total workforce of the project is 250 people, distributed on different sites. In particular, the number of electricity construction workers divided into 8 groups, construction of river dike line divided into 2 groups. Thus, in the construction group of subproject items, the group with at least 6 people, maximum of 50 people**.**

1.7. Area of influence

The subproject is implemented in Cu Lao Dung district - is an area of special importance, the sentence of two large estuaries Dinh An and Tran De, belonging to the island system on Hau River in Soc Trang province, lying close to the sea East, four sides are surrounded by water. Therefore, the impact area of the subproject is only located in Cu Lao Dung district.

1.8. Demand and sources of raw materials and fuel:

❖ ***Materials:***

Materials are classified into 2 main types: construction materials and embankment.

- Types of construction materials such as iron, cement, wood, stone, sand .... taken from suppliers in Soc Trang city. It is expected that the investor will take construction materials of Tan Phu Co., Ltd., Cu Lao Dung Center (Business License No. 2200213048 issued on August 16, 2017 (changed for the 5th time) and Thuan Thanh Phat Building Materials Co., Ltd, commune An Thanh 1, Cu Lao Dung (Business License No. 2200738380) The main supplies for the project construction are presented in Table 1.5.
- Excavated soil - embankment: Road embankment clay is exploited locally with the exploitation location defined in the working record on July 31, 2017 (Appendix) and make use of excavated soil to fill dike. The volume of excavated and filled soil has been calculated by the design consultancy unit, specifically presented in table 1.6.

Table 1. 5. Materials of contruction

No	Construction material name	Unit	Mass
1	Sand types	m^3	26.964,47
2	Stone types	m^3	11.798,77
3	Types of steel	kg	29.559,48
4	Geotextile	m^2	59.340,96

5	Cement types	kg	144.216,14

Table 1. 6. Estimated mass of excavated soil materials - covering the general project area

Unit: m^3

No	Categories	Excavated soil (E.S)	Land cover (L.C)
1	Upgrading of sea dykes (Level III works)	840.529	666.996
2	Constructing two new dyke lines of Con Tron and Ben Ba rivers	855.110	773.778
3	Upgrade provincial road 933B	121.750	111.069
4	Renovate and build new electrical system	21	13
Total		**1.847.410**	**1.551.843**

According to Document No. 1776 / BXD-VP dated August 16, 2007: the average conversion coefficient of excavated land to embankment land.

Table 1. 7. Average conversion coefficient of excavated land to embankment land

No	Compaction coefficient, soil density coefficient	Coefficient
1	K = 0,90; g ≤ 1,75T/m^3	$K_{CĐ}$ = 1,10
2	K = 0,95; g ≤ 1,80T/m^3	$K_{CĐ}$ = 1,13

The required mass of excavated soil is calculated according to the formula:

$$V_{E.S} = K_{CĐ} \times V_{L.C} + K \times V_{E.S}$$

$$\Rightarrow \quad V_{E.S} (1-K) = K_{CĐ} \times V_{L.C}$$

Inside:

$V_{E.S}$: Volume of soil to dig

$V_{L.C}$: Volume of soil to be filled

$K_{CĐ}$: Coefficient of conversion from excavated soil to embankment.

K: Coefficient of fabric drop in transport taking K = 5%

Excavated soil includes excavated soil for foundation pit, leveling soil, gravel soil and excavated soil, in which, canal digging soil has low mechanical criteria, small natural dry weight and saturation of water above 80 % should be drained to the appropriate moisture to be compacted to achieve the required density. Through the calculation of the volume of earthwork and digging of consultants to prepare feasibility reports and calculation and inspection according to the regulations of the Ministry of Construction, the volume of excavated soil fully

meets the demand for the volume of soil embankment and other of the subproject. Thus, the amount of excavated soil in the subproject is reused to make excavated soil and no waste soil.

❖ ***Demand for raw materials :*** The subproject's fuel demand includes gasoline (690 liters), oil (580,906 liters) and electricity (133,539 Kw).

❖ ***Water demand:*** According to the calculation of the total cost estimate, the demand for water supply for the project construction item is about 3 m^3/day on average.

1.9. Waste dumps and transportation routes

❖ **Waste dump:**

- Vegetation derived from the process of ground clearance is mainly junk grass, timber trees. Garbage is collected and transported by road to Cu Lao Dung landfill. The trees are used by people to make firewood.
- Waste generated from site clearance, construction waste is mainly steel, steel sheet, concrete, waste mortar, plastic packaging. Recyclable wastes are classified by the subproject owner for reuse or sale of waste materials, no longer usable waste, collected and transported by road to Cu Lao Dung landfill.
- Hazardous waste arising from the construction process such as batteries, lubricant rags ... collected, stored and stored by the functional unit (contracted with the subproject owner) to transport to storage of the unit for processing.

❖ **Transportation route**

Raw materials from suppliers are transported to the construction site by waterway (250T barge). When arriving near the shore, it is transfer to small boats and ships for convenient transportation. The transportation route is as follows: Xang Lon canal - Dai Ngai - Hau river - foot of the works (direction 1: gathering at Dinh Tru bridge, direction 2: gathering at Rach Rach bridge).

The materials after loading and unloading ashore will be transported by car (distance from 1-7 km) to material gathering yards (camp location). Location of transportation route is shown in Figure 1.18.

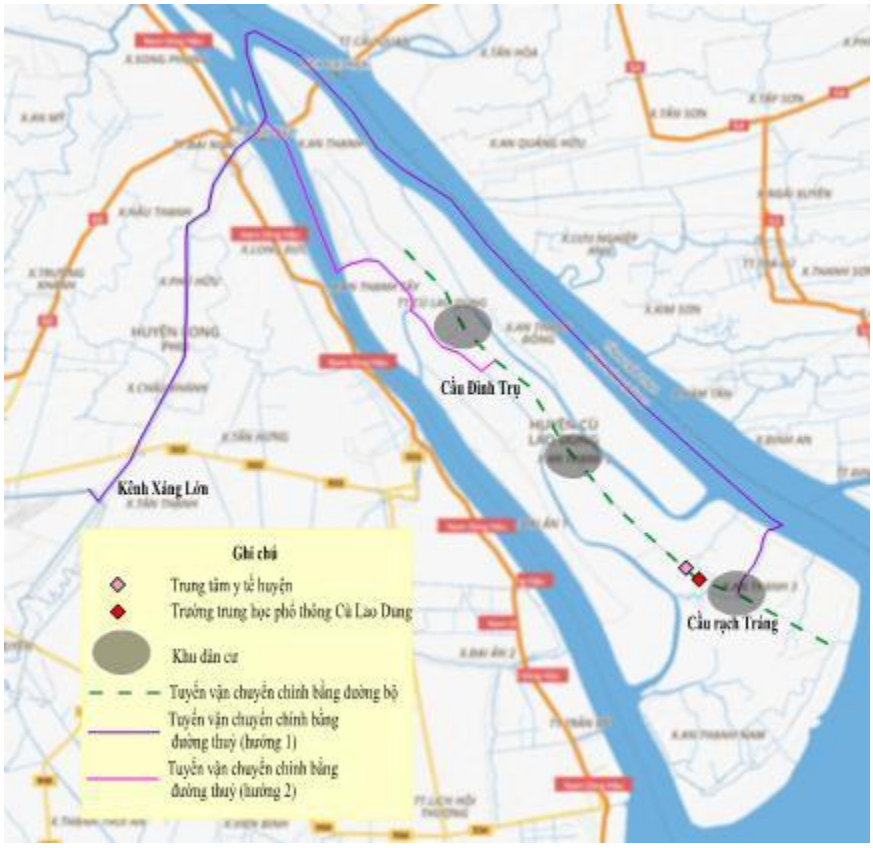


Figure 1. 18. Transportation route

1.10. Auxiliary items

❖ Electricity and water supply plans

Water supply plan: If the quality as well as the volume of water in bore wells meets the requirements of construction and living, water from drilled wells will be used (well drilling & installation of pumping and storing equipment). If drilling well water cannot be used or reserves are not sufficient, it is necessary to organize the transportation of water from freshwater areas.

Power supply plan: Electricity used for construction and living will be taken from the national grid. However, to avoid the delay of construction due to power outages, the project owner will equip a backup generator.

❖ Camps for workers' activities

Workers' camps are divided into 2 areas: Work area (material gathering area, office ...) and living area (living camps, dining halls ...). The total number of camps for workers is 12 camps, of which about 8 points for the dyke (distance of 7.5 km will have a camp in the total length of more than 60 km of dykes) and 4 points for roads, upgraded bridges (5.5km distance will have a camp in the total length of nearly 22km). The camps have a total area of about 500m^2, in

which the working area is 400 m^2 and the working area of the workers is 100 m^2. Around the area planned to build camps are mainly agricultural land, camps No. 11 and 12 are located near Cu Lao Dung Mangrove Forest.

Figure 1. 19. The location of the construction camp

1.11. Investment capital and implementation schedule

The total cost of implementing the subproject is: **799.629.214.454** VND (equivalent to 34.466.776 USD). The project will be implemented in 5 years (from 2017-2022) as shown in the following table:

Table 1. 8. Divergence of implementation progress of construction items

No	Name of subproject	Intend time	Begin	Finish
1.1	**Contruction Part**			
	Detailed design	4 month	06/2018	12/2018

	Compensation for site clearance	12 month	1/2019	6/2019
	Construction bidding	06 month	1/2019	06/2019
	Construction of items and afforestation	42 month	6/2019	12/2022
1.2	**Livelihood conversion model part**	42 month	1/2019	12/2022

Source: Total cost estimate, 2018

1.12. Organization of project management and implementation

Soc Trang People's Committee is the level of investment decision, which is the agency approving investment projects, bidding plans and approving project settlements; Implementing agencies include Project Management Unit 2, Department of Agriculture and Rural Development ... People's Committee of Soc Trang province, Cu Lao Dung district directs the project, takes responsibility for the whole work of site clearance and compensation. Project resettlement.

The Central Office for Water Resources Projects (CPO) is the overall project owner who performs the function of the overall project coordinating agency.

The Department of Agriculture and Rural Development of Soc Trang province, the project investor, the Project Management Unit 2 of the province is the unit that performs the project management tasks and is responsible for strictly managing the progress and quality of the works and funding . invest in construction process until the end of the project.

CHAPTER 2. NATURAL, SOCIO-ECONOMIC CONDITIONS

2.1. Natural condition

2.1.1. Geographical location

The subproject implementation area is located in Cu Lao Dung district, Soc Trang province, about 231 km from Ho Chi Minh City, 62 km from Can Tho. The boundary of the subproject area is defined as follows: (i) The West - North borders My Phuoc island; (ii) East - South borders on the East Sea; (iii) East - North borders Dinh An estuary; and (iv) West - South borders on Tran De gate. Cu Lao Dung district is located in the island system on Hau river in Soc Trang province, is the largest island of Hau river, close to the East Sea, four sides are surrounded by water. This is also an area with a particularly important position, the term of two large estuaries Dinh An and Tran De.

Figure 2. 1. Geographical location

2.1.2. Terrain and geological characteristics

2.1.2.1. Terrain and geomorphology

Cu Lao Dung is the largest island of Hau River, located in the lower Hau River, adjacent to the East Sea, completely separated from the mainland, four sides surrounded by water. The total natural land area of the district is over 26,481.9 ha (2014 inventory data) located entirely on the island. The island has 17 km of coastline (accounting for nearly 24% of the coastline of Soc Trang).

The project area is quite flat but divided into many islands and unstable. Elevation compared to sea level from + 0.5m ÷ + 1.3m, in which the great part has the height from + 0,7m ÷ + 0,9m. Most of the land area is lower than the high tide, so when the tide is high, water spills into and destroys agricultural production and infrastructure of the population.

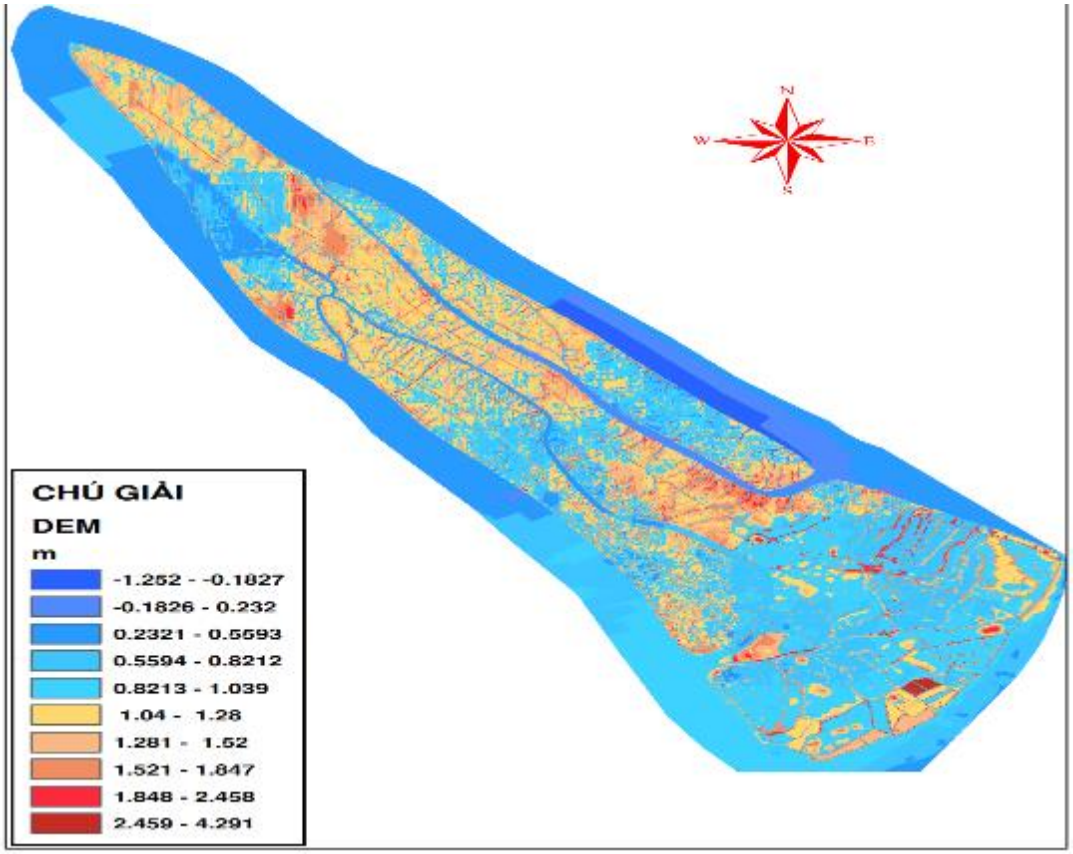


Figure 2. 2. Digital elevation map (DEM) in Cu Lao Dung district

2.1.2.2. Construction geology

The area of Cu Lao Dung has weak geology, often submerged with clayey mud layer with low physical and mechanical criteria. Therefore, the height of the dyke should be limited, not over 3.00m, and the structure of geological layers is as follows:

❖ ***Background geology:***

- Layer 1: Embankment clay, high mechanical criteria($\varphi^o = 15^0 44'$; C = 0.541kG/cm^2) , thin layer thickness (1.5m - 2.5m) should have little effect on the load capacity of the project.
- Layer 2: The weak soil layer has an internal friction angle and ($\varphi^o = 4^0 53'$; c = 0.112kG/cm^2) small, large thickness (18.0m - 21.1m). This layer of soil is not able to withstand the load of construction, high subsidence compression.
- Layer 3: Soil layer with high mechanical index ($\varphi^o = 27^0 15'$; c = 0.121kG/cm^2). . However, this layer appears uneven. During the survey of Grade 3 only appeared at the locations of drilling holes CLD3, CLD7. Baby layer thickness (1.2m - 3.0m).
- Layer 4: Good soil layer has high mechanical criteria ($\varphi^o = 12^0 34'$; c = 0.401kG/cm^2). .This class, appearing in all survey boreholes, compact subsidence, can withstand the load of the project.

2.1.3. Climate and meteorological conditions

The climate of Cu Lao Dung district is characterized by a tropical climate with an equatorial monsoon and divided into 2 distinct seasons. The annual average temperature is 26.6^{o}C, the highest temperature in the year around April (28.2 ^{o}C) and the lowest in January (25.4^{o}C). The total average annual radiation is relatively high, reaching 140-150 kcal /cm^2. The total average hours of sunshine is 2,297.7 hours (about 6.28 hours/day), the highest in March is 282.3 hours, and the lowest in September is 141.5 hours. The average annual rainfall is 1,600 - 2,230mm, the difference is large by season, the rainfall in the rainy season accounts for 90% of the total annual rainfall, the dry season is very little, there is no rain. The rainy season starts from May to November. The dry season starts from December to April next year. The annual average humidity is 84% (the highest is 89% in the rainy season, the lowest is 75% in the dry season).

Soc Trang has a monsoon regime. The northeast wind blows from December last year to April next year, the southwest monsoon blows from April to November. Because the province's terrain is relatively homogeneous, in the same direction the wind is unchanged, but the wind speed changes Significant changes near the sea (southern province) wind is stronger, winds are higher than the surface wind. Average wind speed of 2m/s. The highest wind speed is 31 m / s, around December in the period of changing seasons, the wind blows in the opposite direction of the flow of the Mekong River (windy season), pushing saline water into the strong intrusion into the inland, causing difficulties in production Agriculture. Wave regime in the coastal area of the Mekong Delta is directly related to the monsoon regime. For the Hau river estuary, there is the East-North wave season (dry season) and the wave season with the South-West direction (rainy season). The North-East wave season has a large frequency in November of the previous year to January of the following year. The southwestern wave season has the maximum frequency in August and September.

In recent years, the situation of natural disasters has been very complicated, natural disasters

often occur in the province including storms, floods, storm surges, whirlwinds and lightning. Typhoons associated with high tides and floods in October and November each year cause the most damage to production and people's life.

2.1.4.Water resources, hydrology:

2.1.4.1. Hydrological and oceanographic conditions

Cu Lao Dung has a busy river system with more than 360 rivers, canals and 17 km of coastline, distributed throughout the district, concentrated mainly in Con Tron and An Thanh Nam communes. Most of the rivers and streams in Cu Lao Dung district are affected by irregular semi-tidal regime, the water level elevation of the two tidal peaks and the two tide legs are not equal. The highest tidal peak is 160 cm (October and November), the lowest is 123 cm (in May and August), the highest tide is -24 cm (November), the lowest is -103 cm (June), average tidal range from 194 to 220 cm.

2.1.4.2. Surface water

The main canal system in the project area is shown in Figure 2.3.

Cu Lao Dung is a district located between two estuaries in the Mekong River system, so the main water supply for agricultural production and aquaculture is taken directly from the two estuaries of the Mekong River system. The surface water source of Cu Lao Dung district is abundant, but most of the area is saline in the dry season with saline concentration and the time of saline intrusion gradually increases towards the estuary. On the other hand, the project area is divided by many large canals, thus limiting the ability to transfer fresh water to the southeast areas. According to the results of surface water quality analysis in Cu Lao Dung district on July 17, 2017 and compared with QCVN 08-MT: 2008 / BTNMT, the water in this area is quite good (Temperature = 28.2, pH = 7.04, DO^- = 3.35 mg / L, EC - 273 mS / m, Turbidity = 134.7 NTU, BOD_5 = 4.42mg / l, COD = 20.8 mg / l, TSS = 126.5mg / l, $NH4^+$ = 0.508 mg / l, Cl^- = 666,5mg / l, NO_2^- = 0,066mg / l, NO_3^- = 0.328mg / l, PO_4^{3-} = 0.051mg / l , Fe_{total} = 1.45mg / l, P_{total} = 0.218mg / l, SO_4^{2-} = 152.9 mg / l, No Cr^{3+} and N_{total} detected).

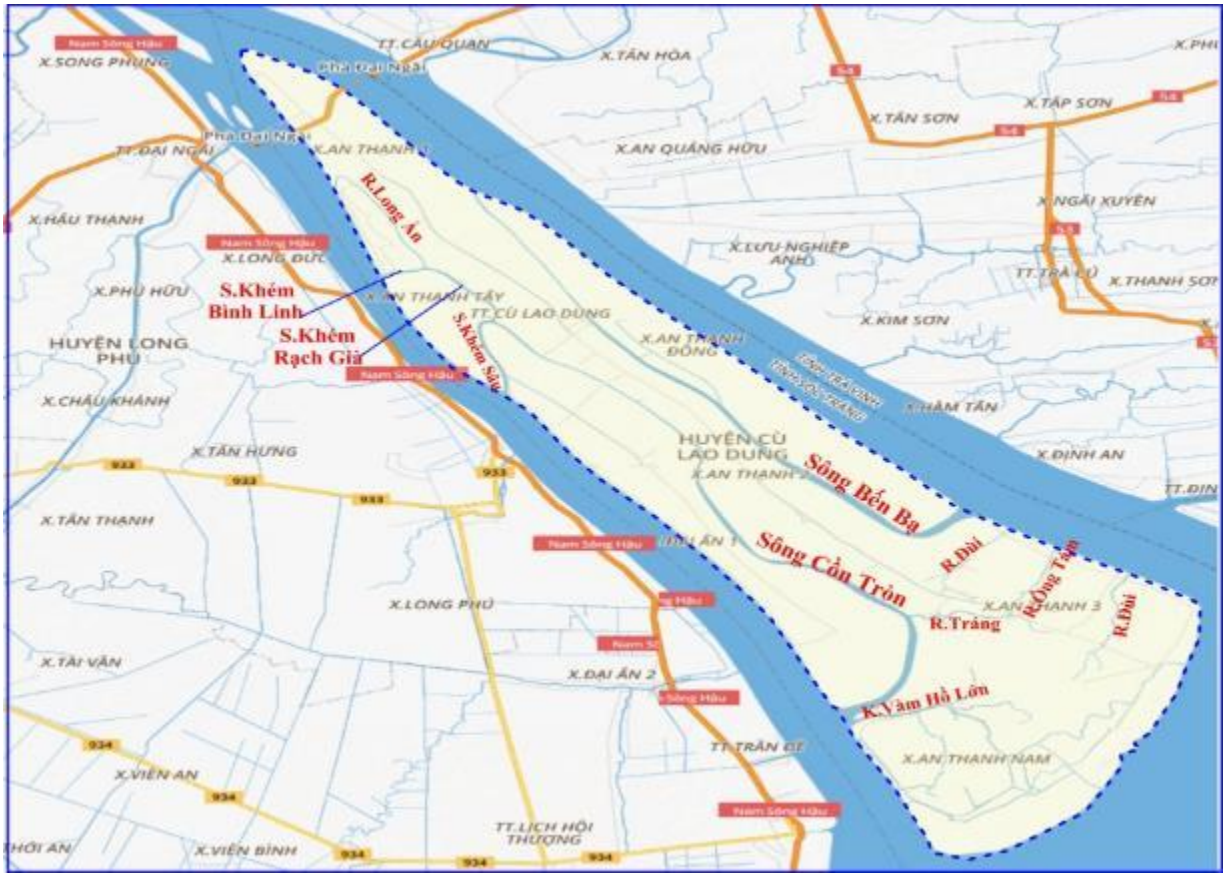


Figure 2. 3. River system, making the main project area

2.1.4.3. Undergroud Water

According to the groundwater distribution map throughout the Mekong Delta, the project area is located in areas with rich groundwater that can be exploited for daily life. In the northwest of the region, there is abundant fresh water at all depths.

2.2. Current quality of physical environment components

In order to assess the current status of air quality in the project area, the Investor cooperates with the consultant to prepare the Social and Environmental Impact Assessment Report is Nam Thien Investment Consulting, Construction Design and Trade Joint Stock Company conducted survey, measurement and sampling analysis on the project area on July 17-18, 2017. Selected sampling locations are representative at the sampling location to monitor changes in environmental quality due to project construction items (environmental status sampling map is shown in the appendix).

- Surface water samples are taken at 09 locations in the areas of canals, sea dikes but the water environment will be affected by the process of construction of sluice gates, places affected and concentrated by people living, mud dump ...

- Soil samples were taken at 04 locations at the construction sites of 4 big bridges in the project area to assess the quality of excavated land before building the bridge and culverts.
- Air samples were collected at 04 locations in the impacted and concentrated areas of the population, particularly at large bridges to assess the air quality of the project area before construction in the area residential.
- Sediment samples were collected at 04 locations at 2 large rivers and 2 locations in the sea in the project area to assess the current sediment quality in the project area before construction.
- Samples of groundwater were taken at 04 locations in households in the project area to assess the current state of groundwater quality before construction.

2.2.1. Current state of surface water environment

To assess the current state of the environmental quality of the background in the area of the project, the project owner has combined with technology consultancy Centre of environment and labor safety and hygiene conducted surveys, measurements and sample analysis.

- Sampling time: 17-18 / 07/2017
- Time of sampling: Cloudy sky, light wind, no fog - good visibility, no rain, dryness and mild sunshine.
- Sampling locations:

NM1: Surface water at Khem Binh Linh (X=568095; Y=1071435);
NM2: Surface water at Khem Ba Hanh (X=568305; Y=1070788);
NM3: Surface water at Khem Sau (X=569216; Y=1069636);
NM4: Surface water at Ben Ba river (X=571787; Y=1069709);
NM5: Surface water at Con Tron river (X=574109;Y=1065310);
NM6: Surface water at sea dike area (X=530836;Y=1050843);
NM7: Surface water at Tran De estuary (X=524914;Y=1050843);
NM8: Surface water at Dinh An estuary (X=532163;Y=1059582);
NM9: Surface water at Vam Ho Lon canal (X=525110;Y=1055030).

The results of surface water quality analysis are presented in Table 2.1.

Compare analysis results with QCVN 08-MT: 2015/BTNMT on surface water quality, column B1 (Used for irrigation, irrigation or other uses with similar water quality requirements or The purpose of use as type B2) shows that most of the indicators are within the allowable limits, there are some criteria that do not meet the permitted standards such as:

- The content of COD, BOD_5 and TSS in the water at the sampling locations in the project are mostly slightly higher than the permitted standards, which can be explained by the fact that there are many farming households along the river aquatic products (shrimp) during the

process of draining the shrimp ponds with the amount of organic matter in the pond will dilute into the river water so the organic matter on the ground is washed away into the river / canal/canal system in side of TSS, COD, BOD_5 in the country tends to increase, this affects the aquatic system of the project basin and shows that the water of the canals here is showing signs of organic pollution;

- Fe index in water exceeds standard (4.81 - 53.2 times higher) in most measurement locations, so surface water in the project area may be slightly alum.
- Besides, the water quality in the project area has slightly higher chloride content (from 1.42 to 4.8 times), this is entirely consistent with geological conditions and geographical location of the project area. The areas near the sea will have a higher chloride content, so the salinity in these areas will be higher.
- In general, river water quality can be used for irrigation purposes to serve people in the project area with plants that can tolerate alum and salinity. Water in this area needs to be treated further to ensure the use for living.

Table 2. 1. Surface water quality in the project area

No	Index	Unit	NM1	NM2	NM3	NM4	NM5	NM6	NM7	NM8	NM9	QCVN 08-MT:2015/BTNMT	
												B1	B2
1	pH ($26,1^0$ C)	-	6,25	6,18	6,22	6,2	6,28	6,31	6,27	6,15	6,32	**5,5 – 9**	**5,5 – 9**
2	DO	mgO_2/l	6,49	6,47	8,71	7,41	**1,69**	5,94	5,55	6,19	7,31	≥**4**	≥**2**
3	TSS	mg/l	**95**	**97**	**96**	**52**	43	**112**	**113**	**97**	**58**	**50**	**100**
4	COD		**38**	**45**	**38**	19	13	**109**	**96**	**79**	**44**	**30**	**50**
5	BOD_5		**20**	**26**	**21**	10	9	**70**	**58**	**50**	**24**	**15**	**25**
6	Nitrit		0,026	0,029	0,028	0,095	**0,567**	0,028	0,036	0,034	**0,058**	**0,05**	**0,05**
7	Nitrat		6,82	6,91	6,23	**12,8**	8,95	6,17	8,24	7,16	8,95	**10**	**15**
8	P-PO_4^{3-}		0,224	0,217	0,221	**0,041**	0,024	0,142	0,194	0,148	0,095	**0,3**	**0,5**
9	Clorua		108,6	132,1	129,2	**650,4**	**857,7**	**1.704**	**1.704**	**1.590**	323,8	**350**	-
10	Total N		7,19	7,34	6,6	17,75	15,28	9,25	11,11	10,26	10,56	-	-
11	Total P		0,672	0,651	0,663	0,123	0,066	0,426	0,582	0,444	0,285	-	-
12	Pb		KPH (MDL=33 $\times 10^{-4}$)	KPH (MDL=33 $\times 10^{-4}$)	KPH (MDL=33 $\times 10^{-4)}$	KPH (MDL=33 $\times 10^{-4}$)	KPH (MDL=33 $\times 10^{-4}$)	KPH (MDL=33 $\times 10^{-4}$)	KPH (MDL=33 $\times 10^{-4}$)	KPH (MDL=33 $\times 10^{-4}$)	KPH (MDL=33 $\times 10^{-4}$)	**0,05**	**0,05**

13	Fe		**51,16**	**6,47**	**8,71**	**7,41**	**1,69**	**67,51**	**75,54**	**79,81**	**7,21**	**1,5**	**2**
14	Oil		KPH	KPH	KPH	KPH	KPH	KPH	KPH	KPH	KPH	**1**	**1**
15	Total coliform	MPN /100 ml	4.100	6.300	4.600	3.800	2.700	**9.000**	**8.400**	7.000	5.000	**7.500**	**10.000**

Source: Center for environmental technology and occupational safety and health consultancy, July 2017

KPH: Not detected (MDL = 0.3); LOD: Limit of detection; LOQ: Quantitative limit.

2.2.2. Current state of groundwater environment

Groundwater is taken from drilling wells of some households with a depth of wells from 50m to 80m. Comparison of analytical results presented in Table 2.2 with QCVN 09-MT: 2015/BTNMT - National technical regulation on groundwater quality shows that the quality of groundwater environment in the project area is of good quality. However, the content of ammonium in groundwater in this area is slightly higher than the norm (from 3.3 to 4.3 times). The cause may be due to excessive use of organic fertilizers affecting water sources. In general, the quality of underground water is good, can provide water for construction of construction items.

Table 2. 2. Quality of groundwater in the project area

No	Index	Unit	NN1	NN2	NN3	NN4	QCVN 09-MT 2015/BTNMT
1	pH ($28,5^0$C)		6,18	6,20	6,22	6,19	**5,5 – 8,5**
2	Total hardness	mg $CaCO_3$	255,5	282	175	189	**500**
3	TSS	mg/l	12	13	17	15	**-**
4	Clorua		2,56<LOQ (LOQ=5)	2,98<LOQ (LOQ=5)	5,11	22,01	**250**
5	Sulfat		38,41	42,73	27,94	10,08	**400**
6	Nitrat		0,058	0,062	0,065	0,074	**15**
7	Nitrit		KPH (MDL = 5×10^{-3})				**1**
8	Total Fe		0,796	0,418	0,552	0,124	**5**
9	Pb		KPH (MDL = 33×10^{-4})				**0,01**
10	NO_3^-		4,34	1,36	3,25	1,73	**1**
11	As		KPH (MDL = 2×10^{-3})				**0,05**
12	Zn		KPH (MDL=0,047)				**3**
13	Total Coliform	MPN/100ml	2		2	KPH (MDL=2)	**3**

Sampling location

NN1: Households Doan Tuan Hung in An Thanh Tay commune, near Binh Linh bridge (X = 1,071,617, Y = 568,235)

NN2: Household Phan Van Tri in Dai An commune 1, near Xeo Lau bridge (X = 1,065,145, Y = 573,312)

NN3: Duong Van Sam household in Dai An commune 1, near Ong Dinh bridge (X = 1,062,772, Y = 574,280)

NN4; Household Doan Tuan Hung in An Thanh Tay commune, near Binh Linh bridge (X = 1,071,617, Y = 568,235)

2.2.3. Current state of soil environment

High quality fertile sandy and sandy soil groups also ensure agricultural production: wet rice, short-term industrial crops such as sugarcane, soybeans, short-term vegetables and fruits such as: pomelo, durian, mango ... Saline soils and other soil

groups also contribute to the plants suitable for brackish water environment: Rhizophoraceae, Aegiceras corniculatum, Avicennia ... also contribute to the landscape ecology of the district.

Compare the results of soil quality analysis presented in Table 2.3.and QCVN 03-MT: 2015/BTNMT - National technical regulation on permissible limits of heavy metals in soil for agricultural land shows that the quality of soil environment in the project area is of good quality, **metal indicators such as As, Cu, Pb, Cd, Zn are lower than allowed standards many times.**

Table 2. 3. Land quality of the project area

Unit: mg/kg

No	Index	Đ1	Đ2	Đ3	Đ4	QCVN 03-MT: 2015/BTNMT Agricultural land
1	As	6,41	4,23	20,3	4,22	**15**
2	Cd	KPH (MDL=0,5)	KPH (MDL=0,5)	KPH (MDL=0,5)	KPH (MDL=0,5)	**1.5**
3	Cu	23,2	28,6	25,1	20,1	**100**
4	Pb	21,4	19,6	23,0	25,7	**70**
5	Zn	87,2	75,0	104	93,3	**200**
6	Hg	KPH (MDL=0,32)	KPH (MDL=0,32)	KPH (MDL=0,32)	KPH (MDL=0,32)	-

2.2.4. Current state of sediment envirnment

The result of sediment qualityannlysis are presneted in Table 2.4 below:

Table 2. 4. Quality of sediment in the project and surrounding area

Unit: mg/kg

No	Index	TT1	TT2	TT3	TT4	QCVN 43:2017/BTNMT	
						Fresh water sediment	Salt water sediment
1	Cu	22,7	21,9	27,6	25,6	**197**	**108**
2	Pb	21,4	21,0	15,6	24,6	**91,3**	**112**
3	Zn	79,3	88,0	70,4	74,1	**315**	**271**

4	Hg	KPH (MDL=0,32)	KPH (MDL=0,32)	KPH (MDL=0,32)	KPH (MDL=0,32)	**0,5**	**0,7**
5	Cd	KPH (MDL=0,5)	KPH (MDL=0,5)	KPH (MDL=0,5)	KPH (MDL=0,5)	**3,5**	**4,2**
6	As	13,8	16,0	12,3	16,6	**17,0**	**41,6**

Source: Center for environmental technology and occupational safety and health consultancy, July 2017

Note: KPH: Not detected; LOD: Limit of detection; LOQ: Quantitative limit.

Comparison of analytical results with QCVN 43: 2017/BTNMT - National technical regulation on sediment quality at project locations shows that the criteria of sediment quality in the project area are lower than the norm allowed standard many times.

2.2.5. Current state of air environment

The results od measurement and analysis of air quality around the project area are presentted in Table 2.5

Table 2. 5. Air quality environment in the project area and surrounding

Signed	**Location**	**Noise**	**Dust**	**CO**	**SO_2**	**NO_2**
		Leq (dBA)	$\mu g/m^3$			
KK1	1. Binh Linh bridge area	46	120	5.190	41	20
KK2	2. Xeo Luoc bridge area	48	190	5.300	36	11
KK3	3. Ong Dinh birdge area	58	200	5.440	31	17
KK4	4. Rach Dui 2 birdge area	52	180	5.250	40	23
QCVN 05:2013/BTNMT			**300**	**30.000**	**350**	**200**
QCVN 26:2010/BTNMT		**70**	**-**	**-**	**-**	**-**

Table 2. 6. Vibration measurement results of the project area and surrounding

Location		Acceleratiuon (dB)		Speed (cm/s)	
		Verticality	**Horizontal**	**Verticality**	**Horizontal**
1. Binh Linh bridge area		52	53	0,006	0,004
2. Xeo Luoc birdge arera		49	45	0,004	0,003
3. Ong Dinh bridge area		50	53	0,007	0,009
4. Rach Dui 2 bridge area		43	40	0,002	0,002
QCVN 27:2010/BTNMT					
Area	**Time application**	**Vibration acceleration allowed, dB**		**-**	**-**
Special area	**6am-9pm**	**60**		**No specified**	
	9pm-6am	**55**			
Normal area	**6am-9pm**	**70**		**No specified**	
	9pm-6am	**60**			

Source: Center for environmental technology and occupational safety and health consultancy, July 2017

Compare the analysis results with the National Technical Standard on noise (QCVN 26: 2010/BTNMT), National technical regulation on vibration (QCVN 27: 2010/BTNMT) and ambient air quality around (QCVN 05: 2013 / BTNMT) for the indicators CO, NO_2, SO_2 show that the air quality in the surrounding project area is of good quality, there is no sign of pollution.

2.3. Biological resources

Cu Lao Dung District has a diversity of biological resources, especially the mangrove forest area in the south of Cu Lao, with many animals living naturally under the forest canopy. According to the report "Biodiversity conservation planning in Soc Trang province to 2020", the biodiversity of Cu Lao Dung is as follows:

- *About plant diversity:* the total number of aquatic plants collected in this ecosystem is 12 species, mainly salty brackish plants such as acanthus ilicifolius, white perch (*Acanthus* ebracteatus) , water coconut (Nipa fruticans), cork (Sonneratia caseolaris), Avicennia marina, Water hyacinth (Eichhornia crassipes).
- *About animal diversity:* the coastal area of Soc Trang province has a diversity of ecosystems of estuaries and mangroves, which is home to a variety of brackish water and saline water with valuable prices. economic treatment. In the area there are 661 species of fish, 35 species of shrimp, 23 species of squid, in addition to

many other species of crabs, crabs and mollusks. The ability to exploit near-shore seafood averages over 20 thousand tons / year. Cu Lao Dung is home to many animals such as mammals: monkeys, otter, weasel ...; forest birds: there are many types, some have immigration practices, only appear seasonally, some settlements include, rats and bats: also very crowded, including rats, rice rats, etc. Bats often find crow bats, bat bats, bat bats, mosquito bats, big horse bats, ThaiLand bats with about 1100-2000 individuals. ... residing in fruit orchards; Crustaceans and mollusks: there are representative species such as wind cuffs, copper crabs, giant freshwater shrimps, copper shrimps, slang cloves, ground shrimps ... all kinds of snails such as bitter snails, snails, snails, mussels .. . Amphibians: there are small frogs, frogs, and bullfrogs ...

In the region, the subproject infrastructure items will be built, the main biological resources are the agricultural ecosystems in 3 distinct ecological regions, the island top is a sweet upstream area favorable for development. fruit tree The ability to plant sugarcane is about 5,600 ha by 2020, in addition there are some fruit trees distributed in An Thanh 1 and An Thanh Tay communes such as citrus, mango Taiwan; The middle area of brackish water is favorable for brackish water shrimp and fish models; The end of the island is salty water, which is very suitable for the economic models of the forest such as: farming, snail, clam ... This is an advantage for Cu Lao Dung economic development associated with eco-tourism.

Livelihood models are mostly deployed under the Cu Lao Dung mangrove canopy. In addition, the subproject also has a forest planting item at the coast of the mudflat area (Figure 1.16). Cu Lao Dung mangrove forest is a breeding and breeding area of species mainly cork, Avicennia marina, mangrove, coconut water; coastal mudflats of over 8,000 ha including clam breeding grounds of over 300 ha and commercial clams of over 5,000 ha. According to Soc Trang Forest Protection Department, there are more than 10 colonies of monkeys, otters, bats and storks in the coastal area of Cu Lao Dung. Under the mangrove canopy is a breeding and regenerating place of many brackish aquatic species. According to the report "Diverse zooplankton in Cu Lao Dung mangrove ecosystem, Soc Trang province" is printed in the Journal of Science - Can Tho University in 2013, planktonic animals in submerged forest ecosystems Cu Lao Dung salinity has about 60 species such as protozoa, cladocera, rotifera, copepoda, and other groups such as veliger, Mysidacae larvae, larvae of polychaete (Polychaeta) and nematode.

2.4. Economic, cultural and social environment

2.4.1. Land area and land use status:

2.4.1.1. Number and situation of land use

The natural area of Soc Trang province is 331,160 ha, of Cu Lao Dung district 26,482 ha. Land for agricultural production is 12,900 ha, accounting for 81.21%, forestry land is 1.317 ha, accounting for 8.36%, aquaculture land is 1,546 ha, accounting for 9.81%. (details are presented in Table 2.7)

Table 2. 7. Status of land use in Cu Lao Dung district

Soil style	Total (ha)	Percent (%)
Total of land	26.482	100,00
I. Agricutural land	15.766	59,53
1. Land for arigruculture production	12.901	81,83
- Annual crop land	10.477	81,21
+ Paddy land	-	-
+ Other annual crop land	10.477	81,21
- Prennial crop land	2.424	18,79
2. Forest land covered by tree	1.318	8,36
- Productive forest	-	-
- Protective forest	1.318	8,36
3. Water surface land for fishing	1.546	9,81
4. Land for salt production	-	-
5. Others	1	0,01
II. Non – agricultural land	10.727	40,47
1. Homestead land	304	2,84
2. Special used land	10.412	97,16
3. Religious land	6	0,06
4. Cemetery	5	0,05
5. River and specialized water land	9.314	89,45

Source: Statistical Yearbook of Cu Lao Dung District, 2016

2.4.2. Residential Characteristics

a. Residential and residential districbute

Cu Lao Dung district has 63,757 people, accounting for 4.8% of Soc Trang's population. Natural population growth rate is 1.35%. In the population of An Thanh 1 commune is 8,397 people, An Thanh Nam commune is 6,929 people. The natural area of the district is 261.43km², of which An Thanh 1 commune is 31.46km², An Thanh Nam commune is 64.53km². The average number of people per household is 4.2 people and 2.4 workers. Population density in Cu Lao Dung district is 252 people / km^2 belonging to Kinh (95.46%), Hoa (0.08%) and Khmer (4.46%). The population is concentrated in the riverside areas, along the main transport routes and in high land areas, convenient for transportation and economic development.

Cu Lao Dung District has a number of festivals with bold ethnic characteristics of the district such as hestival Sen Dolta (worship of the ancestors of the Khmer) and the Festival of Chol Chieng Thmay (in the new year), Golden Festival (July), mainly in areas where many Chinese people live, the Ky Yen ceremony in pagodas and temples is held around 3 consecutive days in a year depending on the temple family.

c. Labor and jobs

The rate of labor in the region is quite high, the total number of employees by age is 34,527 people, accounting for 54.16% of the total population. Labor tends to increase, about 32,523 people in 2002 increased to 34,527 people in 2012. Labor mainly works in agriculture, focusing only on the beginning and the end of the crop, industry and small-scale industry develop slowly.

The results of the socio-economic survey carried out during the sociological survey with 1,595 affected households (affected) because the project shows that 1,213 affected households have male heads, accounting for 76.05% and 382 female headed households, accounting for 23.95%.

1,026 affected households have a head of household under 55 years old, accounting for 64.33% of total surveyed households, of which male headed households account for 49.03% (782 households) and the number of female headed households accounting for 15.3% (244 households). The head of household in this age group is often the main income earner in the family, playing a role in economic development for the household. 569 affected households have a household head over 55 years old, accounting for 35.67%, of which the number of male household heads is 27.02% (431 households) and the number of female heads is 8.65% (138 households). .

Table 2. 8. Characteristics of affected household head by gender and age

Age	Male head of household		Fale head of household		Total household	
	Household	Percent (%)	Household	Percent (%)	Household	Percent (%)
55 year old and	782	49,03	244	15,30	1026	64,33

Age	Male head of household		Fale head of household		Total household	
	Household	Percent (%)	Household	Percent (%)	Household	Percent (%)
younger						
55 year old and odler	431	27,02	138	8,65	569	35,67
Total	**1.213**	**76,05**	**382**	**23,95**	**1.595**	**100**

Source: Socio-economic survey in July 2017

Table 2. 9. Age of household head affected by gender by commune/town

Commune/ Tower	Age of household head					Gender of household head				Total household
	55 year old and younger		55 year old and older		Total household	Male		Female		
	Household	Percent (%)	Household	Percent (%)		Household	Percent (%)	Household	Percent (%)	
Cu Lao Dung tower	294	18,43	159	9,97	453	331	20,75	122	7,65	453
An Thanh 1	9	0,56	4	0,25	13	12	0,75	1	0,06	13
An Thanh 2	376	23,57	238	14,92	614	471	29,53	143	8,97	614
An Thanh 3	239	14,98	81	5,08	320	248	15,55	72	4,51	320
An Thanh Nam	69	4,33	51	3,20	120	94	5,89	26	1,63	120
An Thanh Tay	39	2,45	36	2,26	75	57	3,57	18	1,13	75
Total	**1.026**	**64,33**	**569**	**35,67**	**1.595**	**1.213**	**76,05**	**382**	**23,95**	**1.595**

Source: Socio-economic survey in July 2017

Most of the 1,595 affected households are small in size, 848 have 4 or fewer members (53.17%), 704 affected households have from 5 to 7 people with 704

households (accounting for 44,14%) and 43 households with more than 7 people (2.7%).

Regarding the educational level of the affected household heads, 662 people (accounting for 41.5%) finished secondary school, 647 people (accounting for 40.56%) at the end of level 1, 197 people (accounting for 12.35%) finish high school; 59 people have higher education levels on high school (accounting for 3.7%) and 30 households are illiterate.

Regarding the education level of 382 affected households are women, 176 people (accounting for 11.03%) finish primary school, 140 people (accounting for 8.78%) finish secondary school (accounting for 8.78%) , 37 people have completed high school, 10 people have higher education level (up 0.63%) and 19 households are illiterate (1.19%).

Regarding the monthly income of affected households, 331 households (42.5%) have income from over 5 million to 10 million VND, 195 households (25%) from over 3 to 5 million, 86 households (11%). from 1 to 2 million, 93 households (12%) have income of over 10 million, 72 households (9.25%) have an income of 2 to 3 million and 1 household has an income of less than 1 million.

Occupation of affected household head, 1,038 people (65.08%) working in agriculture, 172 people (accounting for 10.78%) working as hired labor; 310 people (accounting for 19.44%) are small traders, 61 households (3.82%) are government officials, 1 household head is workers and 13 household heads work in other jobs.

Regarding the main occupation of 382 affected household heads are women, 232 people (accounting for 14.55%) work in agriculture; 51 people (3.2%) work as hired labor, 11 people (accounting for 0.69%) as government officials, 84 (accounting for 5.27%) of small traders; 1 worker and 3 others.

2.4.3. The economic structure

Regarding economic structure, Cu Lao Dung District, agriculture accounted for 65.20%, industry accounted for 5.8%, services accounted for 29%. The structure of the agricultural sector is as follows:

- ***Cultivation:*** developing fruit trees, mainly mango, longan, coconut, dragon fruit, citrus.
- ***Breeding:*** promote to raise pig, cow and poultry farming. Inspection and control on cattle and poultry, disease prevention are strengthened, no outbreaks have arisen.
- ***Regarding fisheries:*** this is the district's strength with many aquaculture areas, especially shrimp. With its favorable geographical location, Cu Lao Dung develops two types of aquaculture: marine and inland farming.

The district's agricultural extension network is focusing on supporting seedlings and transferring fruit tree planting techniques to farmers in the planning area of production restructuring to speed up the process of restructuring agricultural production of the

district according to direction to improve value and adapt to climate change.

The main challenges in agricultural production include slow improvement of agricultural quality, limited mechanization due to natural conditions of many canals, unstable product prices, precarious output, low base and structure. floors, traffic are not synchronized, the risk of natural disasters is very high, lack of proactive response. Although infrastructure for transport, irrigation and electricity has been improved, it has not yet met the rapid increase in production demand, especially the use of electricity for shrimp farming. The main reason is due to the effects of climate change, drought, saline intrusion; the situation of disease in agriculture is increasingly complicated, the price of agricultural products is unstable; Local investment resources are limited.

About practice of aquaculture, people do not comply with farming techniques, culture conditions are not suitable for animals and aquatic products, by disease ... In fact, currently, dead animals, aquatic production at cattle farms, poultry, aquaculture thrown into the street, thrown into the canal uncollected regulations. Animal carcasses and aquatic products will degrade when foul smell unpleasant, especially on hot days. Threw the livestock, poultry, aquaculture indiscriminate not only pollute the environment but also cause outbreaks

2.4.4. Existing infrastructure and services

2.4.4.1. Education

Currently, Cu Lao Dung district has 22 primary schools, 7 secondary schools and 2 high schools, including some along the provincial road 933B.

2.4.4.2. Medical

People's health care has been focused, medical stations have met the standards, meeting the needs of medical examination and treatment of the people. Currently, the district has 7 centers / heath, including 6 commune health stations (Dai An, An Thanh Dong, An Thanh 1, An Thanh 2, An Thanh 3, Cu Lao Dung Town) and 1 district health center. Some health facilities are located along the provincial road 933B.

Every year, there are about 200-400 dengue fever cases in the district (311 cases in 1 September 2017). The reason is that people's consciousness is not high in killing mosquito larvae. The district has implemented a campaign to prevent dengue and environmental hygiene and check water containers with larvae in households, distribute leaflets on disease prevention; propaganda on district loudspeakers.

The situation of HIV/AIDS infection in Cu Lao Dung tends to increase, mainly through sexual transmission. As of 2017, there are 120 cases of HIV/AIDS in the district, including AIDS and death of 32 cases. The district has directed the functional industry to follow, monitor and develop plans, set up prevention and control programs in high-risk groups by propagating on loudspeakers, distributing leaflets, documents and direct propaganda ... helps raise awareness of people in preventing this disease.

2.4.4.3. Water supply and drainage

In the district, there are concentrated water supply stations which are operating effectively: including 2 concentrated water supply stations operating with a design capacity of 480m^3 / day and night (Cu Lao Dung town) and 1 station with a capacity of 960m^3/day (An Thanh 3 commune), the pipeline mainly serves the areas of Cu Lao Dung, An Thanh 3 and An Thanh towns. Only An Thanh Tay commune has only the water supply network going through a part. According to statistics in the district, the percentage of households using clean water according to the Standard No.02 of the Ministry of Health reaches 40%. Currently, Soc Trang Water and Environmental Sanitation Center has invested in building a water supply plant in An Thanh 2 commune, Cu Lao Dung district to meet and ensure clean water demand for people in the area.district.

In the district, there are a number of areas with drainage systems such as the road 933B, running through Cu Lao Dung town, the section running through Trang Rach bridge residential area. In addition, the system of water supply and drainage canals for aquaculture in the project of improving and upgrading the irrigation system for aquaculture in Cu Lao Dung district, Soc Trang province.

2.4.4.4. Waste collection

Up to 2017, in the district, there are only 3 landfills, no specialized means of transportation, only use upgraded trucks, shield more height to store garbage, these vehicles are currently degraded, greatly affecting the collection and treatment of waste. The average amount of waste generated is about 1.2 ± 0.8 kg / household /day. However, only households in the town area, near the commune center or the households located on the transport route will be able to collect garbage. For the rest, people have to treat their own waste at home in many ways such as: discharging into the river, burying in the vacant area around the house/in the garden or burning.

The district Women's Union has provided books of communication law on environmental protection for 8/8 associations and 37/37 associations, associations and associations, using law books to propagate and guide domestic mobilize up to 5,790/5,790 to reach 100% of member households and mobilize 5,790 member households to voluntarily implement the campaign of "building a clean 5 and 3 family". The communes and towns have selected 10 households per unit, to guide the education and action program at home to arrange the arrangement of kitchen appliances, sorting garbage, removing garbage in the prescribed places, implementing security food safety.

2.4.5. Cutlural, history and Archaeologists

Cu Lao Dung district has established a district cultural and sports center with many special programs to serve people in the area such as the " Red Phonenix flower", the fundraising and cultural programs. Mid-Autumn Festival, sports festival ... In addition, on major holidays such as Vu Lan Festival, Buddha's Birthday Ceremony, Ooc Om

Boc Festival ... the temples in the district are very solemnly organized.

In the living community, there are mainly three types of beliefs: Buddhism, Christianity and Protestantism. These three types coexist in parallel with each other in the ethnic Khmer community and achieve equal equality in community activities.

In the district, there are cultural works including: Ho Chi Minh Temple in An Thanh Dong commune, more than 5 km east of the center of Cu Lao Dung district (about 450m from the river dike line to the east); The Rach Gia memorial, more than 2.5 km from the center of Cu Lao Dung district to the Northwest (about 900 m from the river dike to the West); An Minh Pagoda is located on Doan Van To Street, Cu Lao Dung Town (about 200m from Ben Ba river dike line to the west, 600m from the upgraded road to the east); Wath Kos Tung Pagoda is located in An Thanh 2 commune, Cu Lao Dung (about 600m from the upgraded road to the West); Con Tron church is located in Dai An commune (about 3 km from the river dike (at the last position) to the north).

2.5. Charatistics of current status the project

a. The sea dike

The sea dike will beupgraded with length 22.454 km from Mu U canal to Ngay canal

Table 2. 10. Characteristics of backgroud Conditions on sea dike

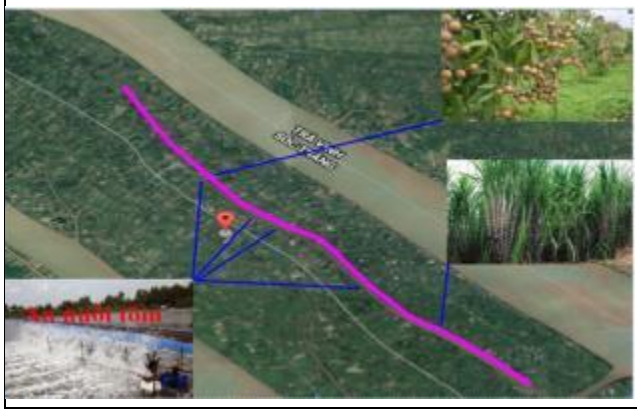
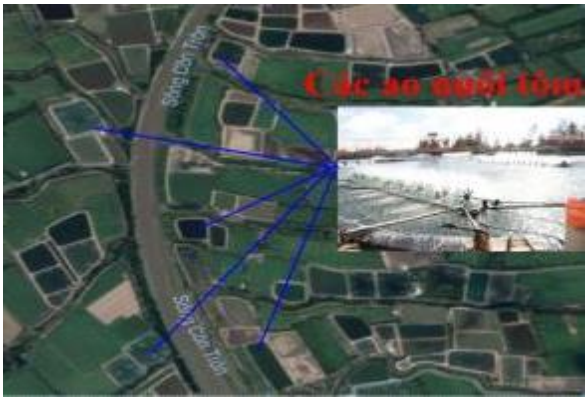
Currently	Status pictures/ object is vulnerable
The traffic bridge will be upgraded at K0 (Mu U 2 birdge), Km 0+400 (bridge number 1), Km 1+900 (bridge number 2), Km 3+500 (bridge number 3), Km 3+900 (bridge number 4), Km 18+500 (bridge number 5), Km 21+500 (bridge number 6)	**An Quoi hamlet, An Thanh 3 commune**: from Km 14+900 to K17+400, 2 banks mainly natural mangroves forest and aquaculture
	
An Nghiep hamlet, An Thanh Nam commune	

Currently	**Status pictures/ object is vulnerable**
Along the densely populated dike, many people live near the dyke near Km 18 + 500. 	From the position of Km 18 + 500 and toward the Northeast about 500m, there is An Thanh Nam commune market 
The puffer sluice will be built at Km 1 + 200 (Culvert No.1 at Ong Nam canal) and Km 1 + 300 (Culvert No. 2 at Ong Bay canal) belonging to An Hung and An An 3 hamlets; Km 2 + 100 (Culvert 3 at Sau canal), Km 2 + 150 (Cong 4 at Rkhem canal) and Km2 + 700 (Cong 5 at Khoi canal) belong to An Binh hamlet, An Thanh 3; Km 12 + 700 (Culvert 6), Km 3 + 400 (Cong 7) and Km 16 + 300 (Cong 8) belong to An Nghiep hamlet, An Thanh Nam commune.	Saline prevention sluice gates will be upgraded at Km 1 + 300 locations (Culvert No. 1) at An Hung and An Thanh 3 hamlets; Km 2 + 600 (Culvert No. 2) in An Binh hamlet, An Thanh 3; Km 3 + 900 (Culvert no.3) in An Quoi hamlet, An Thanh 3; Km10 + 800 (culvert No. 4), Km 12 + 700 (Culvert no.5), Km16 + 400 (culvert No. 6) and Km 18 + 570 (culvert No.7) belong to An Nghiep hamlet, An Thanh Nam commune.
	
At Km 14+020 (An Nghiep hamlet, An Thanh Nam) will build a bridge. 	At Km 9+020 (An Nghiep hamlet, An Thanh Nam) will build a culvert.

Currently	Status pictures/ object is vulnerable
	

b. Characteristics of current status river dyke

Table 2. 11. Characteristics of backgroud conditions on river dyke

Currently	Status pictures/ objects are vulnerable
Ben Ba river dike line: about 15km long, 2 river banks have shrimp ponds along the route. About 100-200m away from the dyke bank, there are agricultural land for longan cultivation and sugar cane	
	
Km 3 + 00 to Km 4 + 100 concentrates a lot of inhabitants, with Doan Van To High School (Km 1 + 270) and Ben Ba Market (Km 1 + 660).	
Km 6 + 400: from the dike to the northeast about 450m in Nguyen Cong Minh A hamlet, An Thanh Dong commune has the President Ho Chi Minh Temple	Km 7 + 600: about 170m from the left canal and about 1 temple in Pham Thanh Hon hamlet, An Thanh 2 commune

Con Tron river dike line: 2 banks are mainly shrimp ponds and about 100m from the river bank is the agricultural land of the people. Residents live sparsely along the dyke line, with only sections of bare land, productive land without inhabitants. At Km 8 + 200 (Phuoc Hoa A Hamlet), there are a lot of inhabitants, about 50m from the dyke bank and Cu Lao Dung District District Committee.

Vam Ho Lon river dike line: Land in the dike area is mainly agricultural and aquacultural land. The sides of the dyke are sparsely populated and far apart. Around the dike line, there are 2 boat wharves: the wharf via Rach Trang - Kenh Ba (west), Vam Ho Lon (southwestern direction) and An Nghiep amusement park (east) about 1-1.5km from the dike.

c. Current status along the 933B traffic and 9 new bridge contruction site

c1. Current along the 933B traffic

The current status of the road along the provincial road 933B is shown in Table 2.12 below:

Table 2. 12. Characteristics of background conditions on traffic rout 933B

<table>
<tr><th>Currently</th><th>Status pictures/ Ojectis are vulnerable</th></tr>
<tr><td colspan="2">Part: From km 9+974,46 to km 11+854,48</td></tr>
<tr><td colspan="2">Km 9+974 - km 11+854: The land in this area mainly cultivated agricultual land belong to Phuoc Hoa hamlet
  </td></tr>
<tr><td>Km 11+200: On the left site of the road There is District armed forces Cu Lao Dung
 
</td><td>Km 11+800: On the right there is Political fostering center Cu Lao Dung
  </td></tr>
<tr><td colspan="2">Part: From km 11+854,48 to km 25+550</td></tr>
<tr><td>At Km 11+854,48 to Km 12+500: Residents live sparsely
  </td><td>At km 12+100: Cu Lao Dung General Hospital is 600m away from the route
  </td></tr>
</table>

Currently	Status pictures/ Ojectis are vulnerable
Km 12+200: About 600 meters away from the road on the left, there is Doan Van To High School, 450m on the left, with An Minh Pagoda, 300m on the left with Dai An Primary School   	
Km12+350: On the right side is polite Cu Lao Dung of district 	
Km 12+500 - Km 12+904,48: The area concentrates many residents on both sides of the traffic route   	
Km 12+600: On the left of the way 600m there is Ban Ba market, on the right of the way 900m there is People's committee Cu Lao Dung of district  	
Km 12+904,48 to km 25+550: The two sides of the road are mainly cultivated land (sugarcane, longan), aquaculture ponds and people living sparsely.	

<table>
<tr><th colspan="2">Currently</th><th>Status pictures/ Ojectis are vulnerable</th></tr>
<tr><td colspan="3">  </td></tr>
<tr><td>At Km 13+950: On the left, there is a continuing education - vocational training center in Cu Lao Dung district
  </td><td>At Km 14+164: On the left, there is Cu Lao Dung District Martyrs Cemetery
  </td><td>From Km 16+900 to Km 17+100: Residential cluster in Phan Thanh Hon hamlet
  </td></tr>
<tr><td colspan="2">At Km 17+100: About 450m from road, there is 1 pagoda
  </td><td>From19+000 to Km 19+100: Residents live sparsely
  </td></tr>
<tr><td>From 20+400 to Km 21+200
  </td><td>From 21+300 to Km 21+600
  </td><td>From Km 23+600: About 600 there is Wath Kós Tung pagoda
  </td></tr>
</table>

Currently	**Status pictures/ Ojectis are vulnerable**

Part: From Km 25+550 to Km 26+719,22: The land of the area is mainly agricultural (sugarcane) land and aquaculture (shrimp).

At Km 25+600: About 40m of the road there is heath station An Thanh 1 	On the left and near of the road there is An Thanh 3 high school base 2 
At Km 27+300: On the left there is Peopleo's Committee An Thanh 3 commune 	At km 27+400: On the left there is gas station 
At 27+900: On the right, about 300m of the road there is Rach Trang Church 	At km 28+050: On the right there is Rach Trang market 

Currently	Status pictures/ Ojectis are vulnerable
At Km 28+100: On the right of the road 50m there is Rach Trang post office, about 100m from the road there is An Thanh 3 high school base 1.  	
From km 24+960 to km 27+800: The investor builds a bypass, around bypass are mainly agricultural and some aquaculture ponds of household in An Nghiep commune, An Thanh 3 commune. 	
Km 26+719,22 - Km 30+233,51: The land of the area is mainly agricultural(sugarcane) and aquaculture ponds. 	

c2. Current status of 9 new bridge contruction sites

The current Characteristics of 9 bridge contruction site are show in Table 2.13

Table 2. 13. Characteristics of background conditions at 9 bridge con truction sites

No	Bridge name/location	Status pictures	Currently

1	Rach Vuot bridge: Km3+026		The land of the area is mainly agricultureal lanf, with a number of households are living around the bridge contruction sites
2	Rcah Dinh Tru Bridge: Km12+25		The land of the area is mainly agricultureal lanf, with a number of households are living around the bridge contruction sites
3	Rach Day bridge: Km17+276		Arounding the bridge contruction sites have household to live hre
4	Rach Lon bridge: Km17+808		Around the bridge construction site is mainly agricultural land, some shrimp ponds and residents live sparsely.
5	Rach Ba Chu bridge : Km18+351		Around the bridge construction site is mainly agricultural land, some shrimp ponds and residents live sparsely.
6	Rach Ngay bridge: Km20+39		Around the bridge construction site is mainly agricultural land, some shrimp ponds and residents live sparsely.

7	Ba Keo bridge: Km21+998		Around the bridge construction site is mainly agricultural land, some shrimp ponds and residents live sparsely.
8	Rcah Dui bridge: Km28+640.69		Around the bridge construction site is mainly agricultural land, some shrimp ponds and residents live sparsely.
9	Rach Trang bridge: Km0+530		Arounding of the area is mainly agricultural.

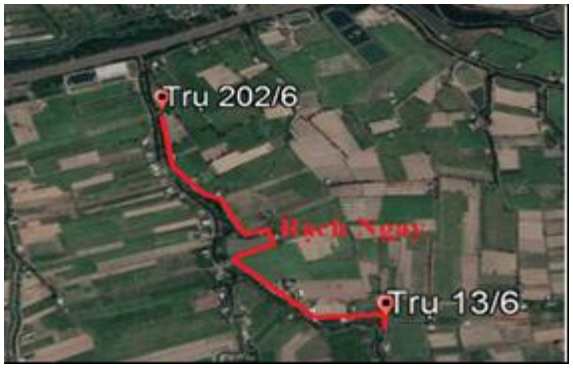
d. Current status of power lines

d1. Current status of medium voltage power line

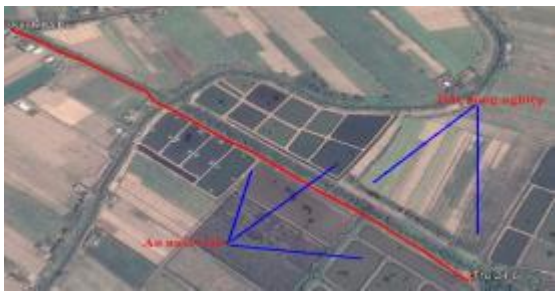
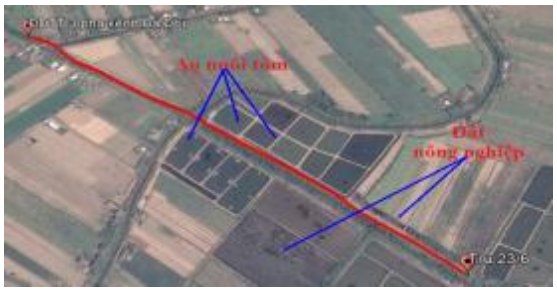
Table 2. 4. Location of medium voltage lines

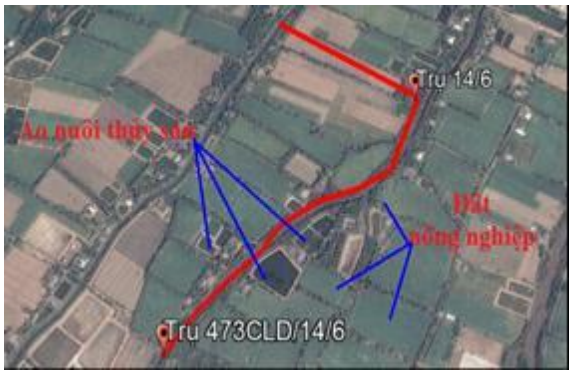
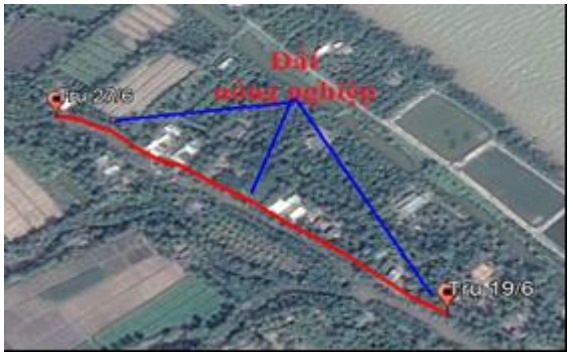
Current characteristics along the medium voltage lines are shown in Table 2.14:

Table 2. 14. Current Characteristics of midium voltage lines

Location	Branch	Currently	Status pictures
A. Improving and upgrading 1 phase midium voltage lines to 3 phase of 22KV - 7.419,3m			
An Thanh 2 area	Mu U branch (pillar 230/6 – tpillar 32/6) - 2.216,7m	Arounding the land is mainly agricultural and there are some aquaculture ponds of the people	
	Nguyen Van Nha branch (pillar 32/6 - 13/6) - 818 m	The surrounding areas are mainly agricultural land and some aquaculture ponds of the people. The route passes through a residential cluster	
	Rach Ngay branch (pillar 202/6 - 13/6) - 1.053,5 m	In current of the land is mainl agricultural	
An Thanh 3 area	Rach Ruot branch to Rach choi branch (pillar 15/6 - 25/6) -1.748,3 m	The current situation around the low-voltage transmission and upgrading areas is mainly agricultural land and there are a few aquaculture ponds near	

Location	Branch	Currently	Status pictures
		low voltage lines.	
An Thanh Dong area	Vam Tac 3 branch (pillar 12/6-471CLD/89/57/13.07) và Vam Tac 4 branch (pillar 471CLD/89/57/13 - 471CLD/89/57/27) - 1.119,3 m	The area of improvement and upgrading of medium-voltage lines is mainly agricultural land, with a few scattered houses.	
B. Newly built 3-phase medium voltage line of 22KV - 9,204.5 m			
An Thanh 2 area	The Mu U 4 branch is connected to the existing Mu U branch (cylinder 32/6 to 37/6 pillars) - 358.5 m	The current status of the new area of low voltage transmission line is mainly agricultural land. The route passes through a residential cluster	
	Branch Mu U 5 (pillar 12/6 - 18/6) - 480 m	The current status of the new area of low voltage transmission line is mainly agricultural land. The route passes through a residential cluster	
Dai An 1 area	Kenh Sau Thu branch (pillar 473CLD/19 - 473CLD/19/11) - 720 m.	The current status of the new area of low voltage transmission	

Location	Branch	Currently	Status pictures
	From pillar 473CLD/37/90A (Chu Dai canal branch) – pillar 473CLD/37/90A /14 (Xom Hau branch) -1.460 m	lines is mainly agricultural land. On the route there are a few scattered houses	
	10 Kinh Branch (tpillar 471CLD/16 - 471CLD/24) - 560m	The current status around the area of new voltage transmission lines is mainly agricultural land.	
An Thanh Nam area	7 Area branch (pillar 49A/6 - 473CLD/15/6) – 925 m		
	Sau Doi culvert Branch (pillar 24/6 - 473CLD/37/6) - 845 m.	Arounding the area of voltage transmission are mainly shrimp ponds and agricultural land	
	From 4 culvert (Quoc Phong dike branch) - 23/6 (Ba Doi canak branch) – 1.262 m		

Location	Branch	Currently	Status pictures
An Thanh 3 area	Rach Lon 1 branch (pillar 310A/6 - 473CLD/7/6) - 416m.	The current status of the low-voltage transmission line is mainly agricultural land and there are several shrimp ponds around. There are a few scattered houses on the route	
	Rach Lon 2 branch (pillar 34A/6 - 473CLD/2/6) - 117 m	Pulling down the low voltage line to the Vam Ho Lon canal, the current status of this area does not go through much of the land of the people.	
	Rach Choi branch (pillar 14/6 - 473CLD/14/6) – 803 m.	The situation around the wiring area is agricultural land and aquaculture ponds	
An Thanh Dong area	Vam Tac branch– WB9 (pillar 27/6 - 19/6) - 1.258 m.	The area of new reclamation of three major phases of Vam Tac - WB9 branch is mainly agricultural land. There	

Location	Branch	Currently	Status pictures
		are a few scattered houses on the route	

d.2. Low voltage line and transformer station

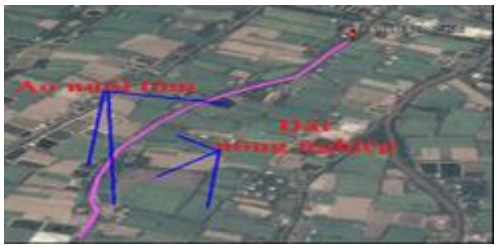
Current characteristics along the low voltage lines and transformer stations are shown in Figure 2.5 and Table 2.15:

Table 2. 5. Location of low voltage lines and substation

Table 2. 15. Current Characteristics of low voltage lines

Categories	Location	Current	Status pictures
A. An Thanh commune area 2			
Improving an uugrading low voltage lines – 5.324m	Mu U 1 substration– 864m.	The situation around the rehabilitation and upgrading areas is mainly agricultural land and near some shrimp ponds of the people	

Categories	**Location**	**Current**	**Status pictures**
	Mu U 2 substation– 954m.	Around the renovation and upgrading of low voltage lines are mainly agricultural land of the people	
	Mu U 3 substation -1.120,3m.	Around the low-voltage transmission line is mainly agricultural land and some shrimp ponds of households	
	Mu U 4 - substation 1.332,3m.		
	Rach Ngay 2 subtation - 1.053,5m.		
New constructi on low voltage line - 3.429.8 m	Mu U 5 substation- 1.332,3m	Around the area pulling low voltage lines is agricultural land and near some shrimp ponds	
	Rach Ngay 3substation - 1.059,5m		
	Area 7 substation– WB9 - 1.038m.		
Substation	Build 2 new substation - 320KVA	Around the construction area, substations are mainly agricultural land of people and away from residential areas: substation (800	

Categories	Location	Current	Status pictures
		m) and substation 2 (900m).	
			
B. An Thanh 3 commnue area			
New construction low voltage line - 2,864 m	Rach Choi substation– WB9 - 1.046 m	The construction area of low voltage lines is mainly agricultural land and near some shrimp ponds	
	Rach Choi substation– WB9 - 210m		
	Rach Lon subatation-1528m.		
	Rach Lon 2 substation -1.00m.		
Substation	Build 3 new substation- 480KVA	The situation around the three construction areas of substations is mainly agricultural land and away from residential areas: substation 1 (590m), substation 2 (2,800 m) and 3 substation (2,790	 

Categories	Location	Current	Status pictures
		m).	 
C. An Thanh Nam commune area			
New contructio n low voltage line - 2.280m	Sau Doi culvert substation- 1.140m. Culvert 4 substation–Quoc Phong canal - 1.140m	Arounding oh the area mainly wire agricultural and some shrimp sponds	
Substation	New contruction of 2 substation - 320KV	The situation around the substation area is agricultural land and away from residential areas: 1 substation (1,300 m) and surrounding 2 substation without residential areas.	 
D. An Thanh Dong commnue area			
New biuding 2.127m low voltage line	Vam Tac 4 substation - 1.193m. An Binh substation- 934m.	Around the station area and low voltage lines are mainly agricultural land of the people	

Categories	Location	Current	Status pictures
Substation	New contruction of 2 substation	Around the construction site of substation are mainly agricultural land of the people and around the substation construction area with people living sparsely.	 
E. Dai An 1 commnue area			
Low voltage transmission line, upgraded - 240	Ong Hai canal substation - 240m.	Around the area of improving and upgrading the station is residential land and a small part of agricultural land of the people	
New construction low voltage line - 3837 m	Rach Chu Dai 1 station - 922 m.		
	Rach Chu Dai 2 substation- 1.085 m.	Around the construction area of low voltage lines is mainly agricultural land of the people	
	Sau Thu canal substation -1.080 m.		
	Muoi Kinh substation–Con Tron– 750m		
	New contruction of 2 substation -	Around the area, there are mainly	

Categories	Location	Current	Status pictures
Substation	480KVA	substations of agricultural land of people and away from residential areas: substation 2 (700 m) and surrounding substation 2, substation 2 with sparsely populated areas.	

e. Current status of forest planting area

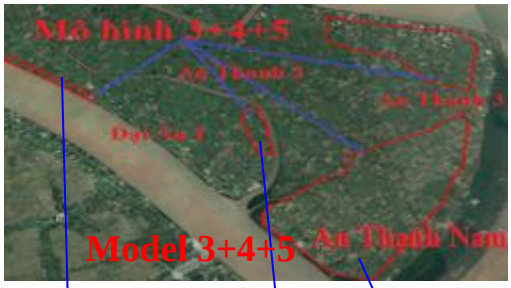
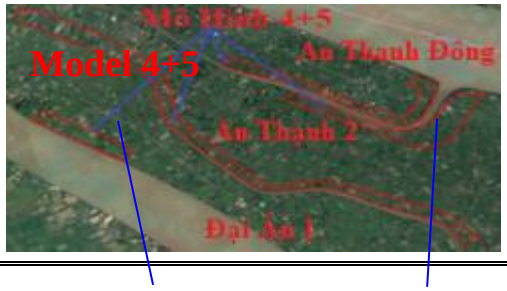
The afforestation area of the subproject is a mudflat, located close to the existing mangrove forest, without inhabitants. This is a place where many plants and animals are concentrated.

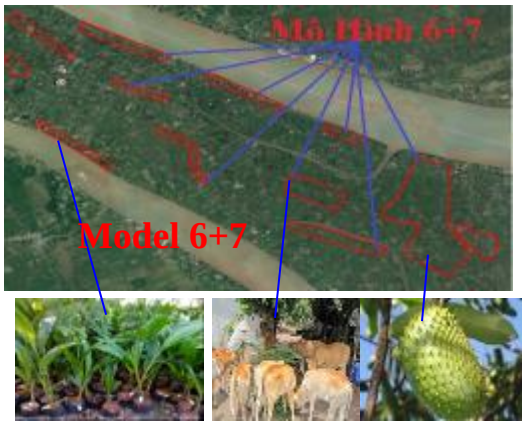
Figure 2. 6. Current status of forest planting area

f. Current status of the pilot area livelihood models

Current Characteristics of the pilot area livehihood models are show in Table 2.16

Table 2. 16. Current status of pilot areas for livelihood models

No	Model	Currently	Status pictures of livehihood models
1	Model 1	The current status of this model is mainly saline soil, natural forest and there is one part of planted forest	
2	Model 2	Current status of model 2 is mainly aquaculture ponds and 1 part of agricultural land.	
3	Model 3	Current status of model 3 is mainly agricultural land (sugarcane) and aquaculture (shrimp)	
4	Model 3+4+5	Current status of the model area 3 + 4 + 5 is mainly agricultural land (sugarcane) and aquaculture (shrimp, tilapia and elongated goby). The area of An Thanh Nam commune is more aquaculture than those in Dai An 1 and An Thanh 3 communes.	 
5	Model 4+5	Current status of 4 + 5 model areas mainly agricultural land and aquaculture ponds along the river. An Thanh 2 commune area along Con Tron river focuses more on aquaculture than those in An	

		Thanh Dong and Dai An communes 1.	 
6	Model 6+7	Current status of the 6 + 7 model area is mainly agricultural land (breed and fruit trees).	

CHAPTER 3: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

A. Positive Impacts

The upgrading of provincial highways 933B along with the construction and upgrading of dike river and sea dykes, items on the dike and power lines will contribute to flood prevention and flood protection, limiting salt water intrusion. When sub-projects completed and put into operation, the saltwater intrusion and flooding due to storms and floods, high tides will be limited and controlled by a system of dikes of river and sea. Whereby agricultural production and people's lives will be more stable. Limiting salt water intrusion will also contribute to improving access to fresh water for people. When completed sub-projects, there will be 58 031 beneficiaries.

Power supply system improvement will create favorable conditions for the production, storage, primary processing of agricultural products, contributing to economic development.

Traffic will be improved to create favorable conditions for the transport of agricultural products in Cu Lao Dung.

When the route is complete, the freight will be faster and reduce transport costs, quality is maintained better help the product will be stable and higher, bring more income to the farmer. Traffic improvements will facilitate the cultural exchange activities, festivals and tourism.

The afforestation will contribute actively to protect the coast, erosion control, reduce wind due to the tide, storms and floods. Additional planting mangrove forests also contribute to protect biodiversity areas Cu Lao Dung because it is inhabited by many aquatic species, fisheries have economic value and biodiversity.

The livelihood models will contribute to promoting cleaner production practices and safe, to help stabilize the lives and incomes of the people against the effects of climate change. The activity of aquaculture is done by the method of raising natural environmentally friendly, reduce emissions and ensure restriction of chemicals, waste, enhance fisheries resources reduce the exploitation of forests, forest products . The training activities, monitoring the implementation of the model towards clean production will contribute to reducing the environmental impact of agricultural production, improve the safety of agricultural products.

Capacity to adapt to climate change. Sub-project's objective is to expand aquaculture area certified as organic in Soc Trang and enhancing adaptive capacity to climate change through sustainable livelihood models for market orientation. This will contribute to improving forest area, contributing to climate change response. In addition, the establishment of responding to climate change, along with campaigns to raise awareness of people about the harmful effects of climate change will also contribute to improve the capacity to adapt to climate change.

Increase the income of local people. Ensure infrastructure will help people assured boldly invested in large scale production, higher efficiency. The investment project will ensure stable agricultural production to adapt to the tide, active in the production of flexible and convert production model brings better livelihood for the people in the area. The investment project will be to exploit existing potential in the district about the natural conditions, humans to grow expand diverse production models, stable yield higher economic efficiency. Besides the positive effects mentioned above, the implementation of the subproject will also cause these negative effects and certain risks for the environment and society. Potential negative impacts and risks are identified, analyzed and evaluated here according to the category of works (River dikes and sea dikes, roads and electrical system upgrades and non structural items (afforestation and the productions model).

B. Potential negative impacts and risks

B.1 **The categories of works**

3.1. Classify negative effects and risks

Will have the potential negative impacts and risks in the preparatory phase of construction, construction and operation of sub projects. By analyzing basic data, field survey project area, consultation with stakeholders, the potential negative impact on the environment and social aspects of the project have been identified. The potential impacts are identified and classified as follows:

Big impact (B)

- Affect the large area of land use, the critical area or alter the environmental status of the 2-year period;

- Impact beyond standards and regulations allow. Long-term impact, on a large scale;

- Change the ecosystem and affect the ecosystem in large areas, or moderate influence (lasting more than 2 years) but the ability to recover the ecosystem within 10 years;

- Effect on human health;

- Causing damage economically for the people around the project area or community;

- The risk of a major impact on environmental and social impacts can only be controlled and minimized if the application of appropriate mitigation measures.

Average impact (M)

- The impact on a large area in the period from 6 months to 2 years;
- Changing ecosystems or ecological functions locally in a short time with good resilience. Impact levels similar to current changes but potentially cumulative impacts;

- Can (not) affect human health; influence for some people around the project area;

- The impact of moderate, localized, temporary and should adopt mitigation measures.

Small impact (S)

- The impact on the environment, society making major changes in less than 6 months time, that changed moderately in less than 2 years time;

- Impact in standards, regulations allow, causing small changes at the present time. Impact completely controlled;

- The impact can affect daily activities but do not interfere with the community;

- The impact of mild to health and quality of human life;

- Small impact, locally and temporarily can ignore.

Not impact (N)

- The change impacts that can not recognize or can identify, but due to the regular operation can also cause;

- No impact on the environment and society.

What kind of impact and scale of the negative impact of the project identified under each item of the project, presented a summary in accordance with Table 3.1 below: The impact of the work items are identified and the shown in Table 3.1 below:

Table 3. 1**. Summary of negative environmental and social impacts of the project**

Impacts	Physical environment			Ecosystem		Social-economic				Other	Notes
	Air and noise	Land and water	Solid waste	Forest	Aquatic	Land acquisition, Resettlement	Local people	Văn hóa vật thể	Livelihood, social security, land use	Flooding, traffic safety	
Upgrade 22.454 km of sea dikes and upgrading / build works on dike											
Pre-construction phase	N	N	S	S	N	N	S	N	N	N	
Construction phase	S	S	S	M	S	N	S	N	N	S	
Operating phase	S	N	N	N	N	N	N	N	N	N	Positive impact is mainly
New construction 39.892 km of river dikes and works on dike											
Pre-	N	N	N	N	N	M	S	N	M	N	

Impacts	Physical environment			Ecosystem		Social-economic				Other	Notes
	Air and noise	Land and water	Solid waste	Forest	Aquatic	Land acquisition, Resettlement	Local people	Văn hóa vật thể	Livelihood, social security, land use	Flooding, traffic safety	
construction phase											
Construction phase	M	M	M	N	S	N	S	N	S	M	
Operating phase	S	S	N	N	N	N	N	N	K	S	
Upgrading provincial road 933B with a length of 21,827 km and build bridges on the route											
Pre-construction phase	N	N	N	N	N	M	S	N	M	N	
Construction phase	M	M	M	N	S	N	S	N	S	M	
Operating phase	M	S	N	N	N	N	N	N	N	M	Positive impact is mainly
Renovating and building 16,696 km of medium voltage, 19,916 km of low voltage lines, 12 substations											
Pre-construction phase	N	N	N	N	N	N	N	N	N	N	
Construction phase	S	N	N	N	N	N	N	N	N	N	
Operating phase	N	N	N	N	N	N	N	N	N	N	Positive impact is mainly
Restoring coastal mangroves.											
Pre-construction phase	N	N	N	N	N	N	N	N	N	N	
Construction phase	N	N	N	N	N	N	N	N	N	N	
Operating phase	N	N	N	N	N	N	N	N	N	N	Positive impact

Impacts	Physical environment			Ecosystem		Social-economic				Other	Notes
	Air and noise	Land and water	Solid waste	Forest	Aquatic	Land acquisition, Resettlement	Local people	Văn hóa vật thể	Livelihood, social security, land use	Flooding, traffic safety	
											is mainly

3.2. Pre-construction Phase

The impact of pre-construction phase mainly land acquisition, infrastructure affected by land acquisition, risk encountered booms.

3.2.1. The impact of land acquisition

The impact of land acquisition has been taken into account when selecting line works to minimize the impact. However, the land acquisition is unavoidable. The total land area is 561,082 m^2 affected. In it, the land area is permanently revoked 497.936m^2, 63.146m^2 temporary withdrawal. A total of 2194 households will be affected by land acquisition, of which 1,410 households affected by permanent land acquisition and 785 households affected by temporary land acquisition. Details on land area and number of household types affected by the sub-project is presented in Table 3.2 below:

Table 3. 2. Summary of land damage

No.	Property Type	Unit	Area (m^2)		number of households	
			Permanently	Temporary	Permanently	Temporary
1	Homestead land	m^2	10.718	1.62	670	29
2	Annual crop land	m^2	366.56	54.915	662	662
3	Prennial crop land	m^2	37.205	3.22	147	62
4	Water surface land for fishing	m^2	11.453	2.291	30	30
5	Production and business land	m^2	200	1.1	1	2
6	Public land	m^2	43.8	-	-	-
7	Irrigation land	m^2	28			
Total			***497.936***	***63.146***	***1.409***	***785***

Of the 2194 households affected 285 households are households vulnerable (13%), of which there are 43 households of ethnic Khmer (1 near poor, 1 poor and 1 landless production); number of poor households according to criteria of MOLISA 84 poor households; 37 poor households; 76 household policy; 41 households without land production; 4 households have female householder single people eat; 1 households have older single householder or children and 2 households have disabled people. In the households affected, there are 39 households resettled on the rest of the households and 8 households resettled to another place, the remaining households not resettled.

Among the affected households, 75 households greatly affected, accounting for 3.5% (households lost more than 20% of productive land area (40 households) and lost more than 10% of productive land with easy group vulnerability (35 households). In it, there are 35 households in vulnerable groups, 40 normal households.

3.2.2. Trees, work on land affected by land acquisition

Some of the crops and the land will be affected by the revocation of the land. About crops, different trees and 7,788 119.998 m^2 annual tree such as grapefruit, Orange, coconut, Rambutan, durian, cane, ... will be affected. This is the popular, no high value on biological diversity should primarily be economic value by bringing food and income for the households.

The housing of the 132 households will be affected, including the fortified House 17, 24 home semi-permanent, 91 temporary home. 47 homes will be affected the whole and 85 houses were partially affected. 392 households will be affected to the ancillary works, include: kitchen, animal kennels, Shack, fences, sheds, wells. There are 9 graves will have to relocate.

The recovery of the affected households will impact the material and spiritual life of the people due to disturbed life (can reduce or increase the income). 75 households with 281 inhabitants (of which there are 35 households/123 vulnerable people) will be affected by the withdrawal of land from agricultural production 20%-70% of households (and from 10%-70% for households vulnerable).

There are 29 stores will be influenced in part and temporarily. The relocated 9 tombs is the spiritual issues important affected, especially 4 households directly affected.

In the number of households are affected, then the affected households (3.5%), households in vulnerable groups affected (13%) and the households have home on 55 years (35.7%, of which 27.02% of the male householder, 8.65% female householder), these households have non-householder is the object affected. With the number of households affected levels and as such, the impact from the recovery of the land of the sub-project was rated as average and can control. To minimize the negative effects of withdrawal land, minor construction projects have resettlement action plan (RAP) to

assist households affected by many forms of monetary compensation, land (land, support the movement production support...). RAP's content will be presented in the management plan summary environmental and social (ESMP) of the Sub-project.

3.2.3. The risk of accidents and incidents caused by landmines

Cu Lao Dung is the area affected by landmines in war. When construction work items will have to dig deep into the ground, if the mine remains at the construction site, it may be accident, causing casualties and damage to the project. To minimize this risk, the project will arrange to conduct demining before construction as specific content is presented in the ESMP.

3.3. Potential Negative Impacts of Construction Phase

3.3.1. The contruction activities of the Sub-project

The construction activities of the sub-items of the project will include: (1) Clearing, cleaning and preparing the work site; (2) Arrangement of camps where temporary gathering materials; (3) Transportation of materials, machinery, equipment and mobilize workers to work; (4) demolition of existing buildings, cofferdam, temporary roads, diversion... ; (5) Construction excavator (6) piling, piling, embankment and soil compaction, concrete work and concrete .... In the process of the impact that would occur the overall impact and risks on the environment and society, such as dust, noise, vibrations, waste generation and waste water, water pollution, local water, erosion, obstructing traffic and increase the risk of traffic safety, disruption of existing services such as electricity supply or irrigation, disturbed the social order by workers from elsewhere to work and stay in place method, the risks of safety and health for workers and local communities. Also may have particular impact on the type of building and construction site. The general effects and special effects are analyzed, evaluated below:

3.3.2. Potential Impacts of Construction Phase

Table 3. 3. Sources of impact and scale of the impact of the impact

No.	Impact/ wase	Describe the impact	Object / area affected	Level	Timer affected
1	Dust, exhaust fumes, odors, noise, vibration	- Dust arising from transport operations, loading and unloading, assembly of construction materials such as soil, sand, stone, cement and waste generated during the construction process (vegetation, debris); - Gas emissions from cars, trucks and construction machines such as excavators,	- People around construction areas, transport routes; - Workers labor on the construction site; -	Big	Short

No.	Impact/ wase	Describe the impact	Object / area affected	Level	Timer affected
		cranes; - The odor arising from the work of dredging and dike construction to the construction of bridges, culverts; - Noise from the construction machine, while piling bridge construction, assembly of materials; - Vibration injury due to bridge construction piling, road rollers activity.	Infrastructure and landscaping around the construction area.		
2	Solid waste	- Debris from the clearance, clearance bridge. - Domestic waste of workers at the camp; - Construction waste as excess mortar, steel scrap, plastic bag … - Hazardous waste: from hygienic operation and maintenance of construction equipment and transportation;	Residents living along the construction route, camp workers	Medium	Short
3	Waste water	- Wastewater from washing vehicles, machinery and construction. - Wastewater workers at the camp.	Surface water sources around projects	Medium	Short
4	Declining water quality	- Due to dredging operations in the river Ben Ba and Con tron, culvert and bridge construction; - Wastewater from the activities of the workers; - Wastewater sanitation facilities, construction machinery; - Land weathering.	Decline in surface water quality on the canal/river, especially in Con Tron and Ben Ba river.	Small	Short
5	Biological resources.	- Losing part of vegetation and trees by luminescence and peeled weathered; - Activities dredging direct impacts to aquatic systems; - The concentration of	- Terrestrial Ecosystems in the clearance area; - Aquarium at	Medium	Medium

No.	Impact/ wase	Describe the impact	Object / area affected	Level	Timer affected
		workers to construction works on the dike and sea dikes will affect the biological resources of Cu Lao Dung mangroves due to noise and the infringement of workers.	positions build bridges, sewer and dredging. - System regenerate mangroves Cu Lao Dung.		
6	Disturbance and increased risk about traffic accidents	- Activity of construction of roads and bridges on the sea dyke; - Activity of transporting materials, waste affects road traffic - 933B provincial highway and water navigation	The risk for people in traffic and people living along the transport route.	Big	Short
7	The risk of erosion, landslides	Walls of deep excavations (culverts, bridges) can be sliding. Erosion, landslides can also occur in the material dumps, waste.	Not safe for workers, residents and the surrounding infrastructure	Medium	Short
8	Risk increased sedimentation, flooding local	Block small dam construction when land lines, bridges can lead to flooding, sedimentation locally.	In the area of earth small dam construction, bridges and drains	Medium	Short
9	Landscape, urban landscape	The gathering machinery, materials and construction of roads can cause aesthetic construction area.	Route 933B, dykes, electricity lines.	Big	Short
10	Cause damage, disruption of services existing infrastructure	- Cause damage, disruption of infrastructure services. Drainage may be affected during the construction of culverts, dams, bridges ...; - Interrupt power supply when connected to the new system.	People in the construction area, the existing infrastructure.	Medium	Short
11	Social impacts	- Building materials, machinery, construction	People in the construction	Medium	Short

No.	Impact/ wase	Describe the impact	Object / area affected	Level	Timer affected
		waste can disrupt daily life and business operations households roadside. - Access to the side of the road works may be disturbed or interrupted. - The concentration of workers in the field can cause social disorder - Access to the cultural and historical projects can face difficulties caused by construction activities;	area.		
12	Health and safety of workers	Risk of occupational safety of workers work at height in the pole, working underwater and in other dangerous locations. The use and operation of machinery, equipment and construction also has safety risks. Workers also face health risks related to the local common diseases, HIV / AIDS if participation in social evils.	worker	Medium	Medium
13	Health and safety of people	All the activities of the construction process have the potential to pose a risk to safety of workers and citizens around the construction area, especially the unfinished excavation area, the pile of bulky materials, electrical construction, the gas cylinders, welding	People around the construction area	Medium	Medium

The impact is analyzed in detail below:

a. Dust, exhaust fumes, odors, noise, vibration

Air pollution

Air pollution from the operation / construction is generated from cleanup activities prepare the ground construction, transportation, excavation and construction activities categories (concrete, cleaning the road ...)

Dust from clearance activities: According to the model GEMIS V.4.2 of the Department of Environmental Protection Germany, dust pollution coefficient (E) diffusion process from leveling, clean surface can be predicted as follows :

$$E = 0{,}16 \times k \times \frac{(U/2{,}2)^{1,3}}{(M/2)^{1,4}} \qquad (1)$$

Including:
- E: Download pollutant (kg / t)

- k average grain structure (0.35)

- U: average wind speed in the construction area (2 meters / second - under Chapter 2)

- M: the average humidity of the soil during the dry season (58%) Calculated coefficient E = 0.28 kg pollutant / ton.

Every 1 ton of solid waste from cleanup activities clean ground will generate 0.28 kilograms of dust. With approximately 1,192 tons of vegetation, 50 tons of debris, the volume of dust generated during the period by approximately 348 clean surface kg. Cleaning time by an estimated 156 face the day, so the average dust emission at about 2.2 kg of dust per day, equivalent to 76mg / s. This dust load in one region affect the clearance of about 3,597 m2, so the impact of dust from clearance activities are considered minor and manageable.

Dust, exhaust fumes of vehicles:

According to estimates, the total volume of raw materials and equipment transported by waterway subproject about 50,000 tons. With transportation as barge with a load of 250 tons. Estimated total number of ships, barges used to transport materials and equipment by approximately 2 turns waterway vessel / day, so need 200 days to transport both to and back. Based on the coefficient of pollution from the operation of ships, boats by World Health Organization (WHO) established, can calculate the load of pollutants arise.

Table 3. 4. Load of pollutants transported material

Pollutant	Dust	SO_2	NO_x	CO	VOC
Emission factor (kg/1.000km)*	6,8	136S	90,7	0,036	4,1
pollutant load per day (kg/day)	13,6	0,1	181,4	0,1	8,2

Source: World Health Organization (WHO), 1993.

Notes: S - ratio of sulfur in the oil, taken by 0.05%.

With a load of dust, gases generated the highest in the transport process (Table 3.5), it will affect the air quality on transport routes, particularly the area residential area Rach Trang bridges (near shipping route). However, Sub-project only 200 days to conduct transportation in the entire construction period of 4 years (average 1 week shipping 1). Also, dust and gases generated on the entire line to move, not concentrated in one area. Therefore this impact non-continuous, local, influence caused by active transport of materials is an average and can control. This effect can be minimized, the mitigation measures will be presented in subsequent chapters.

Dust due to excavation

These activities often arise digging large amount of dust affecting the health of workers and the people living around the construction area. However, as presented in Chapter 1, mainly excavated pit excavation for construction of bridges, culverts, gravel soil, dredged material ... have large natural moisture. So excavation for construction of the project category of dust, but not many and can be controlled. The degree of influence of this effect is small and can be minimized.

Construction activities and work items

Dust and emissions in SUB-PROJECT primarily arising from construction activities such as watering items 933B road asphalt, concrete mixer, sanitation existing pavement. Load of dust and emissions from these activities can not be calculated, it depends on operation of construction workers, the quality of the existing building or the quality of raw materials. References from the project to build other infrastructure, the amount of dust and gases generated large, affecting the health of people, especially the workers directly implemented. In a short time, workers may get sick respiratory, ENT (nasal congestion, difficulty breathing, coughing, sore throat ...), allergic rhinitis, sinusitis, eye, dermatology ... (depending on the level and depending on each person's own vulnerability); in the long run, the gases generated (especially emissions from the burning asphalt) can cause poisoning, affecting the endocrine glands,
A considerable amount of dust will also arise from activities scraping peeled existing pavement, excavation for construction of sewer and road widening 933B during the construction in dry weather. Along this route there are some residential areas, schools, health facilities ... markets are sensitive to dust areas.

Dust and gases generated large but the impact at the location of construction, therefore, all sub-projects will adopt measures to minimize the impact from dust and emissions to the workers and people who live at location construction.

Noise and vibration

Populated areas, health centers, schools, cultural and historical buildings, offices, mangrove ... are the areas most sensitive to noise. Loud noises may distract or disrupt the daily activities at work, school, annoying process of convalescence, cause

insomnia or disrupt the activities of the family. Loud noise can also disrupt operations and growth feeding of wildlife.

If used for pile driving hammer, the biggest noise emitted during construction of the bridge is in position 95-106 dBA and 63.5 dBA 1.5m from source location 200 meters away from the sources. The pile driving will occur intermittently and only in the early stages of building bridges (each bridge design has 49 piles, pile driving time is 20 days). Figure 3.2 shows the map majority of bridge construction locations are sparsely populated. Bridge No. 10 was built close to Mangrove Cu Lao Dung, will affect the ecosystem of the mangroves as do the animals panic (especially monkeys), decrease the number of animals (because the consciousness of the workers), loss of stability of accommodation, the herd (due to noise emitted will do animals migrate move to another location or dispersing their herds). However, animals that live mainly in the core area of the forest, therefore, this impact is considered small. For monkeys in the mangroves, bridge construction area from monkeys living area over 2 km horizontally, so the pile for the bridge construction will not affect the monkeys. The impact of noise from construction activities can bridge substantial avoided or minimized by just piling conducted during the day, avoid sensitive time or change construction methods. Noise emitted during construction of other categories of sub-projects include the operation of excavators, tractors, road rollers, compactors ... almost only occur intermittently and in a short time should only affect in a short time and the nature of local, insignificant and can control the vibrations arising mainly from the bridge construction works, piling and compacting the road base. Vibration levels of machinery and vehicles in the construction process can be large variations depending on factors such as soil quality, speed of movement of vehicles. Typical vibration levels generated are specified in the following table:

Table 3. 5. The vibration level of the typical device

No.	Equipment	Levels Vibration	Level of Vibration equipment from 10 m	level of vibration equipment from 30m	QCVN 27: 2010/BTNMT
1	Excavators	80	77	67	75 dB
2	Bulldozers	79	79	69	
3	Truck	74	74	64	
4	Compactor	97,5	82	72	

Source: Center for Natural Science and Investment Advisory - Polytechnic University - UD, reports vibration measurement projects built in 2014-2016.

According to Table 3.5, most, in the distance> 30 m, the vibration will be within permissible limits. Therefore, the effect of vibration is considered small because the

existing civil works are located on the edge of road construction 10 m. For the township, sub-project will expand the road to the right bank (from Dai Ngai on) 7m and not fill the canal route running along the status quo; for residential areas Rach Trang, subproject remains scale status quo just upgrading roads and building new drainage system, so in 2 neighborhoods concentrate most land, cottage still meet the project requirements (distances of existing civil works to the edge of the road on 7 m competition).

The subjects sensitive to dust, noise and vibration in the subprojects are listed in Table 3.6 and Figure 3.1 below.

Table 3. 6. Sensitive objects odors, dust, noise and vibration

Construction	Location	Distance to the construction location (m)
The route 933B		
Cu Lao Dung district team	Km 11+200	8
Cu Lao Dung district police	Km 12+350	10
Fostering political center	Km 11+800	21
Center for continuing education - vocational CLD	Km 13 +950	next to the route
Medical station An Thanh 1	Km 26+800	40
People's committees An Thanh 3	Km 27+300	next to the route
An Thanh 1 secondary school	Km 26+300	200
Rach Trang church	Km 27+900	300
Rach Trang Post Office	Km 28+100	65
Rach Trang Maket	Km 28+050	100
An Thanh 3 High school (Base 1)	Km 28+100	100
An Thanh 3 High school (Base 2)	Km 27+400	10
Medical Center Cu Lao Dung district.	Km 25+600	40
Ci Lao Dung Residential commune	Km 16+900 to 21+600	-
Rach Trang residential market	Km 27+300 to 28+500	-
River dike		
Dai An 1 Primary school	Km 5+200	300
An Minh Pagoda	Km 5+290	200
Cu Lao Dung Hospital	Km 5+200	32
Doan Van To High school	Km 5+300	35

Ben Ba Market	Km 5+700	50
Cu Lao Dung district party committee	Km 8+200	180
Sea Dike		
Mangrove	Từ K5+900 to Km22 +454 of sea dike	next to the sea dike

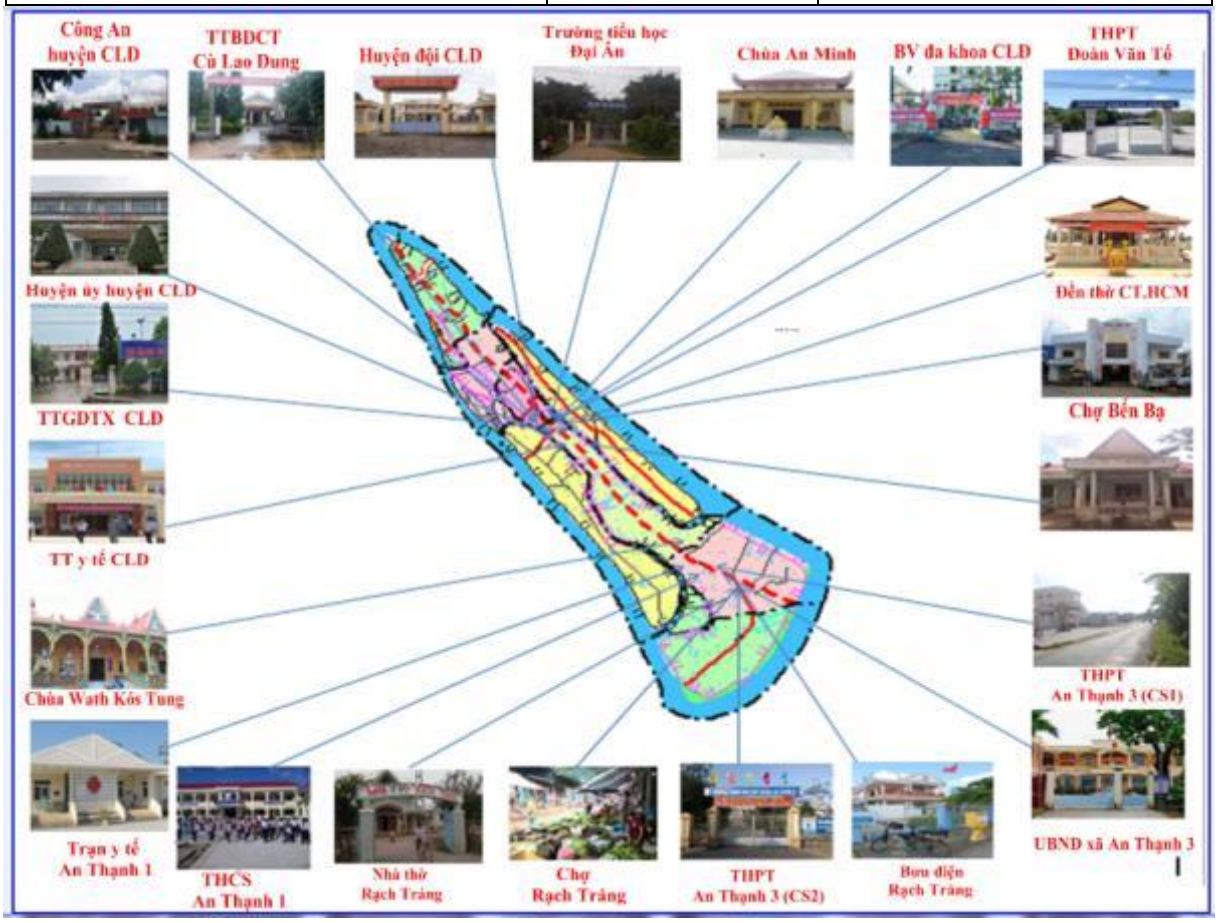


Figure 3. 1. Map project categories and regions affected

Bad smell

In the process of dredging, sludge would be destroyed structures stable dispersion in water, some gas odors H_2S generated during the decomposition of organic substances in anaerobic environments, water will spread . According to the project in channels dug canals, rivers and lakes, the ability to spread the smell from canal was excavated from 3.357 to 29.069 Ou / s.m^2 (odor recognition threshold usually 3 Ou / m^3). Odor from soil dug offensive to the community (especially residential waterfront 2), construction workers directly.

However, dike area mostly agricultural land, on the route only 2 residential area is residential dyke at Cu Lao Dung town and residential areas in Vam Ho, Thanh Nam commune. Volume dredged material is 1,095,774 m^3 (according to estimates), while collecting temporary store dredged material at approximately 1 week air channels,

dredging process intermittently on the dike, so the influence from odors for residents is considered minor and manageable. This is the inevitable impact upon project implementation dredging to get soil. The impact of odors from material dug from the river criver can be minimized by measures outlined in the ESMP.

Figure 3. 2. Residential area on the dike

b. Solid waste

As presented in Chapter 1, all excavated material will be reused to embankment and roadbed. Thus, sources of solid waste in the construction process born from (i) the activities of the workers at the camp and (ii) construction activities (hazardous waste and non-hazardous).

Waste from domestic workers

It is estimated that each worker or living in tents in an average of 0.8 kg waste domestic waste per day (according QCVNXD 01: 2008/BXD Regulation Vietnam Building construction planning), with 12 tents camps and the number of workers in the peak period of 250 people, the amount of waste generated per day is 200 kg, equivalent to 16.6 kg / camp. Solids content of organic matter, is capable of biodegradation include food scraps, fruit peel, remove part of horticulture, paper ... about 60-70%, the rest is solid waste inability biodegradable: cans, beer cans, plastic packaging, glass .... In the decomposition process, domestic waste will generate odors, attract insects and organisms cause disease. If not for temporary storage and collection of reasonable, domestic waste will pollute and negative effects on the health of workers and the community. Can see the number of workers in the construction phase is relatively small, so the amount of emissions from the area of solid construction is low and can be controlled. The negative impact of domestic waste can be minimized by measures to collect and transport to dump concentrated as described in the ESMP.

Solid waste from the construction process

Solid waste from the project construction process include vegetation, debris from the clearance, surplus materials from the construction process (steel surplus, excess mortar, asphalt ...). According to estimates, the waste from the operation clearance of about 50 tons (iron, steel, sheet ...) and 1,192 tonnes of vegetation.

Some of the waste such as iron and steel will be reused, materials dismantling people will take advantage of to leveling by the CU Lao Dung has low terrain.

Vegetation will be classified, the large trunk (diameter greater than 5 cm) will be re-used for temporary items of the project, the small trunk (from 1- 5 cm diameter) for the people salvage. After people recovered, the remainder will be treated as spam and will be collected and transported to the landfill ..

Therefore the impact of solid waste generated from operations are assessed as medium, can manage with measures to collect and transport as presented in the ESMP.

Solid waste generated in the construction process is the waste mortar, steel scrap, packing ... can pollute the soil environment.

In fact, the solid waste volumes are negligible, there are some types that can collect scrap metal.

c. Hazadors waste

Hazardous waste generated in the construction process include: waste oil, rags contaminated lubricants, bulbs, the plastic container contaminated with oil, bink cartridges, batteries with a small amount of 30 kg / month (refer to the actual situation of the project to build the infrastructure already in place). The volume of hazardous

waste depends on the amount of equipment and machinery used for hazardous waste. Without appropriate management, hazardous waste will cause serious environmental pollution. Materials suppliers in collecting as ink, waste oil will be returned providing unit, the hazardous waste the rest will have to be quarantined closely as poured in grave bottom and walls built to not cause Environmental pollution.

Conclusion: The impact of solid waste and construction waste, hazardous waste in the construction phase is in the median and can bring it under control. Sub-project will have to implement management measures to minimize the negative impact to the environment.

d. Wastewater

During the construction process the work items, the wastewater will arise including domestic wastewater from worker camps, dripping water when pumping sand from the river up to embankment and waste water from washing the equipment, construction equipment.

❖ **Domestic wastewater**

Water demand for each worker stated in TCXDVN 33: 2006 - Table 2.1 - Standard water supply per capita - in rural areas. Water volume is 60 liters living / person / day including water for washing, cooking, personal hygiene and 80% of the water used will be discharged into the environment (48 liters/person/day). With the number of staff and workers on the construction site during the peak period is 250, then the amount of water discharged every day is: (48 liters/person / day x 250)/1000 = 12m^3/day, equivalent to 1 m^3/camps/day.

The composition of domestic wastewater mainly suspended solids oil, grease, sediment, organic matter, dissolved organic matter (BOD_5 and COD), nutrients (nitrogen, phosphorus) and micro-organisms . World Health Organization (WHO) estimated load of pollutants in domestic wastewater for developing countries and Vietnam. The average concentration of pollutants in domestic wastewater before putting through septic tanks are shown in Table 3.7:

Load of pollutants in domestic wastewater per camp

Talet 3. 7. Loading of pollutants in domestic wastewater per camp

No.	Waste	The pollution index (g/person/day)	Loading (kg/day)	The pollution index (mg/l)	
				Before treatment	QCVN 14: 2008/BTNMT Column B
1	BOD_5	45 – 54	0,945 - 1,134	945 - 1134	50
2	COD	72 – 102	1,512 - 2,142	1512 - 2142	-
3	TSS	70 – 145	1,47 - 3,045	1470 - 3045	100
4	Grease	10 – 30	0,21 - 0,63	210 - 630	20

5	Total Nitrogen	6 – 12	0,126 - 0,252	126 - 252	50
6	N-NH_4	2,4 – 4,8	0,0504 - 0,1008	50,4 - 100,8	10
7	Total Phosphorus	0,8 – 4,0	0,0168 - 0,084	16,8 - 84	10
8	Total Coliforms	10^6 - 10^9	2,1x10^4 - 2,1x10^7	2,1x10^7 - 2,1x10^{10}	5000 (MNP/100ml)

Comparing the concentration of pollutants in domestic wastewater untreated with QCVN14:2008/BTNMT, column B shows all parameters exceeded the standard. The impact of domestic wastewater can be minimized by building septic tanks and requirements will be included in the ESMP of sub-project. Therefore, the amount of domestic waste water is collected and processed, the environmental impact is low and can be controlled.

❖ **Water runoff from sand pumping action for leveling**

To leveling the existing roads, design consulting unit was considering plans to pump sand from the sand barge on the river and put the pump in two positions as follows: 1. Sand pump pump tube in the channel Dinh Tru and pump ball 2km distance to the middle of each piece and routes; 2. Sand pump tube in Ong Tam Channel (near Rach Trang bridge) and pump ball 2km distance to the middle of each piece online. Construction process implemented by the method of rolling, dig roadbeds and pump sand mold according to each piece, when finished will move to the next paragraph.

Because there is no basis for determining the volume of water needed to pump 1 m3 of sand leveling, we refer to the actual data from the pumping unit to pump sand backfilling the 1 m3 of sand to about 1.2 m3, according to design documents should 203,426.98 m3 of sand filling from aquatic transportation with the distance from 0.5 km - 2 km, the water runoff from the sand pump is 244 156 m^3.

Estimated water runoff is considered small due to the allocation during the tour throughout the project (about 31 km).

Estimated water runoff is considered small due to the allocation during the tour throughout the project (about 31 km).

Runoff during pumping sand high turbidity, levels of suspended solids larger if discharged directly into the canal project area will be able to cause sedimentation of the channel, and if flooding the surrounding area will can cause flooding and sedimentation soil to plant in the garden, or cloudy water if flowing into aquaculture ponds would be able to slow the growth or even killing aquatic life in the pond in contiguous project area.

Moreover during excavation site roadway sand pumps, if rain rainwater runoff through'll entrained soil, sand increased turbidity due to suspended solids (soil, sand, ...) reduces water quality, impacts pole to extract water serves different purposes for water consumption. Overflowing water from the pumping action of sand and negative impacts, risks involved can fully control by creating the grooves around the construction area with holes about to collect, preliminary sedimentation and gave runoff return channel as described in the Environmental Management Plan. Therefore, the impact of runoff from sand pumping action for leveling is considered average and can control.

❖ **Water leaks from the dredged material**

- The project will conduct a number of dredging operations with the main purpose of obtaining the dam material as a road. During the dredge process, the dredge material is put up around non-dykes for natural drying, this process will arise 1 large amount of water. Expected, the amount of dredging material is 1,095,774 m^3, after to dry naturally, the volume will be depreciated by 30%, which:
- The amount of water in the dredging material is 71,225 m^3 (under the action of temperature, wind, the amount of evaporated water is estimated at 5-8%-according to the statistics of Soc Trang Province in 2016);
- The amount of water to penetrate the ground is 131,268 m^3 ((length 62,346 m along the canal, 5m) x duration of construction (3.5 years) x permeability coefficient (the permeability coefficient of sandblasted clay is 10-5 – 10-7cm/s – according to the soil mechanics, , Construction Publisher, 2006).
- The amount of water flowing down the channel is 126,239 m3, equivalent to 86.5 m^3/day. Night (about 10.81 m^3/h).
- Since there is no high-altitude process at the river, the amount of wastewater that will flow into the channel increases the turbidity, which will affect the quality of the input of aquaculture ponds. The negative impact of water leakage from dredging material can be minimized by the dredging material management plan.

❖ **Wastewater due to operation and maintenance of equipment and construction machines**

The wastewater contains organic substances, oil, and suspended waste solid wastes. The experience of similar projects in the Mekong Delta shows the wastewater flow due to operation and maintenance of equipment including: Due to machine maintenance (about 2m^3/day); (ii) Washing equipment and machines (4 m^3/day); (iii) Water coolers (2m^3/day), usually will arise approximately 1 week 1 time, depending on the weather and the level of use. The water will be discharged to canals/canals/rivers or direct discharge to the land at the construction location of the river. The water quality at the canals/canals/rivers (the source of wastewater receiving) will be affected (more or less depends on the water quality of the receiving source). This amount of wastewater is rated as not large, so the impact is small, temporary and controllable. However, the project owner still applies measures to minimize the impact on the water supply due to wastewater sanitation and equipment.

e. Deterioration of water quality

The disposal of domestic wastewater, flowing from sand pumping operation to leveling, wastewater due to operation and maintenance of equipment, construction machinery (analyzed above) into the water source will affect surface water quality in the project area. In addition, land digging activities for the embankment, drain, puffiness, traffic bridge; Dredging operations will also affect surface water quality. The construction of works items can cause impact on surface water quality in subproject areas as follows:

-The process of digging ground pit at projected construction sites, dredging operation to take the channel land will stir the mud layer under the canal, increase the turbidity of the surface water layer in the dredge area increased.

-The dredging to be on the river is capable of spilling ground into rivers (especially rainy days), increasing the turbidity of the river water.

-When the water surface is stirred, mud and pollutants present in the sediment will be separated from the peach and diffused into the water according to the different layers polluting the water environment.

Impaired surface water quality will affect aquatic. When the water turbidity rises, the ability to receive the light of the aquatic plant decreases, reducing the photosynthesis and saturation performance of the oxygen in the water. Increased turbidity also interferes with the respiratory process of aquatic animals, if the turbidity increases excessively or lengthened, which can cause the organism to die. The dredge process is slow, intermittently can cause the ecosystem to recover slowly. On the other hand, deterioration in surface water quality during the dredge period will be able to adversely affect or even kill the organism in aquaculture ponds if the people take water directly into the pond while the water quality is impaired. However, the dredging of the river does not last long and continuously.

In addition, the results of sediment analysis at the table 2.4 and comparable to QCVN 43:2017/BTNMT – National technical regulation on the quality of sediment in project positions indicates that the targets for quality of the project sediment are low More than Regulations allow. Therefore, this impact is rated as moderate and can be controlled.

f. Creature Resources

As stated in Chapter 2, the infrastructure is primarily built within the agricultural ecosystem area so the impact on the creature resource will be negligible. Some plants and shrubs may be lost by luminescent. The impact on the organism resource should be more attentive to the construction category of the Sea Embankment section in the south bordering the mangrove forest of Cu Lao Cham, analyzed as below.

Impact on the ecosystem of CU Lao Dung mangrove Forest

As noted by the Soc Trang Forest Ranger, the ecosystem of the mangrove canopy of Cu Lao Dung District is rich, diverse in both fauna and flora, namely: there are more than 10 long-tail monkeys (300-400 children) , otter, bats, immigrant stork....; Crab, shrimp, scallop, fish and water... Especially clams and other types of armor, plants are mostly salty crops such as fish, sauce,... However, the animals mainly inhabit the core area of the forest, the construction area of the project is about 7-10 kilometers, so the impact of the construction of the infrastructure works on the project to mangroves is very small , which is only locally and confined to the cover of the forest where the sea embankment route is constructed.

The noise from the construction machinery, the concentration of workers and the waste of living will be the main factors that can cause local influence to some plant fish animals in the area near the sea dykes. As rated in the noise section, the noise comes the largest from the pile machine (bridge construction at the Thai Square channel) but the construction position is the way the monkey area inhabits more than 2km so the piling for the construction will not affect the herd Monkey. If noise and concentration of workers can be a number of individuals (if any) living near the area of the sea-panic glands, they can move deeper into the mangrove areas. The impact and risk of flora and fauna in the mangrove area with regard to the concentration of workers in the area of sea dike construction may include hunting acts, chopping trees, twirating or litter , especially plastic waste, some people lack consciousness or legal understanding. However, this impact and risk is only locally and very small because the number of workers is mobilized at about 45 people at peak levels and working at scattered locations along the dike. This risk is controllable by the encampment and application of the Code of Conduct for the workers, the management of the camp and the construction waste presented in the mitigation measure.

Monkey Area Living

Figure 3. 3. The living area of the long-tailed Monkey

Effects of aquatic life

Construction of the project can affect the aquatic life in the project area, namely:

-Dredging operation, digging for sewage construction, the bridge increases the turbidity of the river water (as analyzed in the reduction of surface water quality). Some of the bottoms will be killed when the mud is raised to reduce the amount of water in the area. However, this effect only occurs locally in the short period and will end when the dredging operation is discontinued, the number of bottom organisms will also be restored after a certain period of time. At the same time, according to the investigation, CU Lao Dung area has no rare aquatic species (Journal of Science – Can Tho University, 2013).

-The operation of material transport and machinery operation can cause lubricant leakage; The waste from the construction process increases domestic pollutants, which impacts the quality of the habitat and reduces the number and composition of aquatic species. Waste, especially nylon bags and plastic wastes arising from farms if indiscriminately discarded, packaging the seed to the mangrove zone will hinder the development of aquatic beings , adverse impacts on habitat and life of species in mangrove areas. The range of spreads depends on the flow rate, weather as well as riverside vegetation.

Soil digging/waste leaks down the riverine occurs infrequently, intermittently and can mitigate, so that the effect of this impact is rated as small and can be controlled.

g. Disturbance and increased risk of traffic accidents

The project implementation process will have a huge impact on road transportation and waterway traffic.

For road traffic, the collection of temporary material, waste, machinery and means of construction, the operation of the road during upgrade expansion of 933B Provincial Road and the bridge on the route will cause significant disturbance to the traffic on the route due to current The state of the route has a narrow road surface, the area of construction is restricted by the sides of canals or cultivated land. Disturbance of traffic and the risk of road traffic accidents will also increase in the road passages through the populous, market and school. For the passage through the farmland, the risk of traffic disturbance and traffic accidents will also increase during peak periods of crop time (down to breed and harvest). Disturbance of traffic and increased risk of traffic accidents will be the largest on 2 middle-eastern passages along the transportation route, at the HIGH school An Thanh 3, An Thanh 2 Health station, PPC An Thanh 3, Ben Ba market, etc.

The construction of the bridges will also affect the waterway traffic operation on the rivers and canals. Water traffic will be interrupted at some of the dam construction. Dredging operation can also disturb and increase the risk of waterway traffic accidents.

The effect of the construction on the density of the waterway will be negligible due to the estimate, every week will have 4 barge turns (250 tons) of material transportation (go and back) to the set location. However, the risk of marine traffic accidents may increase at some point during the harvest season of the people (about 9 months) at smaller incision positions.

The risk of traffic disturbance and traffic accidents will be analyzed more specifically in the particular impact. Disturbance of traffic and increasing the risk of traffic accidents during the construction period are considered large, however, can still be minimized by the measures presented in ESMP.

H. Risk of erosion, mudslides

Risks of erosion, mudslides can occur when some heavy machinery such as the Scorpion, excavating machines... Standing or moving too close to the shore (when the soil is not stable), standing or executing too close to the pit, when focusing on the side of the land is not too much in rainy conditions....

The risk of slippage, the soil will be highest in the bulkhead of deep digging during the construction of the drainage along the roads in the urban passages, high ground roofs on the route and the construction of 2 when the roofs are not stable or have not been Reinforced.

I. Local Flood impact

The construction of the 933B route with the passage of the town will extend the road to the right bank of 7m (from the era of the Great Ngai) and do not fill the status of the incision along the road which will flood the area , the training of the nail pit for the bridge, the drain will not increase the risk of flooding by the owner has reviewed and considered the only method to execute the sewage pit in the dry season, when the tide is low. Therefore, these effects are rated at a low level and are subject to control.

K. Shuffle Landscape, U.S. urban

The landscape disturbance, the urban aesthetics of the municipality only occurs locally in some areas along the 933B route. The digging of temporary machinery, construction materials and waste in the construction process of upgrading the 933B route will disturb the urban beauty of Cu Lao Dung town. However, affecting the landscape, the urban aesthetics are only locally, temporary and can be minimized, so this impact is rated as small and can be controlled.

L. Disrupting, interruption of existing CSHT services

Construction of works items may cause damage or disruption of existing CSHT services in the district. Especially the construction of the upgrade route 933Bsegment through the town cu Lao Dung can damage or disrupt the operation of existing infrastructure works such as sewer system, green plant , sea alarm, lights, wiring and telecommunication cables etc. At the same time, the construction of the route can also be difficult for the collection of living waste, especially at Ben Ba market. This is an inevitable impact when implementing projects and can be controlled by mitigation measures.

M. Disturbance of rest, study, culture and beliefs

Although there is no direct impact, the construction activities may cause some impact on works such as An Minh Pagoda, An Thanh HIGH School 3, cu Lao Dung Health Center (group 3.6). The effects that arise mainly include noise (item a), the concentration of the crowd causing disorderly (item m), the risk of traffic accidents

(section G). However, these are all unavoidable influences of the project. Therefore, investors and contractors will apply mitigation measures to limit the disturbance of leisure, learning, cultural and religious activities.

N. Disturbance of production and living activities

The social impacts of SUB-PROJECT's construction include:

Disturbance of agricultural production activities. The construction of the dike glands can disrupt the operation or sedimentation of existing irrigation canals and drains. Agricultural production, irrigating aquaculture from canals can be disturbed or impacted. The transportation of raw materials and agricultural products, especially sugarcane can also be influenced by the construction work of works items; The yield of agricultural production can be reduced due to adverse effects from wastewater, waste gas, solid waste to rice fields and aquaculture.

Social disturbance caused by the concentration of workers. Sub-project construction using up to 250 employees, distributed on different sites, group of at least 6 people (the Electrical construction Group), at most 50 (per river branch) including workers from elsewhere to and some local workers. Although the number of such workers is very small compared to the local population, the focus on migrant workers in certain areas may result in conflicts or conflicts with the locals due to cultural differences , income, and employment. Local order security may also be disturbed if workers engage in evils such as gambling or alcoholism, narcotics. It is worth noting that the sub-project area has 4.5% of the population are Khmer and Chinese ethnic groups with some customary customs practices with the Kinh, if the behavior of inappropriate workers will also be able to lead to social contradictions. These influences can be minimized by manual management measures, which apply the code of conduct to workers.

Dust and shrinking the road surface when upgrading the provincial highway 933B can disturb the travel and the daily operation of the households, especially the operation of the two party business households as well as the travel on the road to the school of Students. Noise can be distraction, affecting teaching activities and learning in schools. This impact can be managed due to construction activities usually performed in the form of a projection, affecting the households on each street that will take place in relatively short time, about 10-30 days. The above impact is only temporary. The level of social impact is on average can be minimized.

O. Safety and health of workers

Construction activities such as earthwork, the collection and unloading of materials, tubes, operation of construction machinery such as excavator, crane, trucks, welding machines, concrete mixers have hidden risk of accidents or pollution affecting workers if No control measures.

The storage and use of fuels such as electricity, gas, petrol, containing a risk of electric shock, explosion, leakage that leads to contamination affect health or accidents such as electrocution, burns for workers.

When working in a field with a wide range of materials and machines, equipment and vehicles are all around when executing sub-project items, when working on high (electrical construction), working on water when required to execute or dredge There will be risks like falling from above, drowning... If careless or without adequate protection.

As stated in the Medical section in Chapter 2, dengue fever is one of the most common diseases in CU Lao Dung. In addition, the situation of HIV/AIDs infection in the district also has a growing trend. As a result, workers from elsewhere to work locally are also at risk for hemorrhagic fever. In addition, if in the process of local stay, there is a risk of workers who are drawn, the enticement to participate in the evils that lead to social diseases such as sexually transmitted diseases, even HIV Aids. .

Conditions of accommodation such as water supply, sanitation in the camp if not guaranteed will also cause illness, affect the health of workers in the short and long term. In addition to the marine construction route in the less populated areas, many dense trees can occur at risk due to the snakes attacking the camps of workers, affecting the health of workers.

The level of risk is rated as moderate and can be minimized by safety measures on the work and sanitation in the area of the camp.

P. People's Health safety

The risks of health and safety for people around the construction area include:

-The risk of traffic safety directly affects people's health: the piles of temporary link materials, garbage from the process of clearance, road construction process, traffic bridge can cause falling, sliding for circulation , people walking especially old and young, students going to school on 933B route as An Thanh 1 elementary School student, An Thanh District 3B, An Thanh 3 High school... Operation of trucks, excavators, cranes, machines can pose a safety risk such as falling, car/collision machines, falling materials, traffic accidents.

-Operation of the construction machinery, the temporary storage of materials including construction materials such as whole drain, concrete beams, the long steel construction bridges have the potential to pose high risk.

-The relocation of infrastructures such as power cables, electric poles, pipelines can also jeopardize residents in the area when not informed, install dangerous sea alarm.

-Dust, emissions from the construction process can adversely affect people's health such as itching, shortness of breath, spicy eyes, sore red eyes... If the long contact time will cause diseases such as dermatitis, respiratory tract inflammation, digestion... However, the emissions of dust at construction sites have been calculated to be small and less likely to have health risks.

-The use of electricity, gas and explosive materials on the construction field can also pose a risk to the safety of people.

The level of risk that is rated is moderate and can be minimized by the measures outlined in the ESMP.

3.5. Specific impacts

3.5.1. Special effects on the construction of sea embankment routes

A/summary of the peculiarities of the impact in the upgrade of sea dike glands:

Subject to impact: wetlands on which there exist mangrove forest ecosystem outside the dike, especially interested in the area of monkey conservation from specific descriptions on the map. The agricultural ecosystem inside the island with the following crops and livestock is as follows: shrimp, labels, sugarcane... And the objects involved in the construction and production in the affected area stated. Currently the environmental quality within the impact is rated as well: the quality of river water can be used for irrigation irrigation to serve the people of the project area with the plants that can withstand alum and salty. Water in this area needs to be further processed to ensure use for living; The indicators of soil quality, sediment are much lower than QCCP; The quality of the air environment around the project area of good quality, there are no signs of contamination.

On the basis of the status of the area subject to the impact of the dykes, in this section only focus on some of the following issues:

b/specific impacts and risks

(i) Impact: environmental chemistry – Biology and ecosystem, society and Community safety;

Impact on the physical environment:

-The number and physical characteristics of soil, water and air: no effluent or has arise but negligible, does not alter the hydrological regime, the customs zone is affected.

-On water quality: Due to the additive operation leading to the drop of materials in the water supply can increase turbidity but due to the characteristic of the preparation material is expected to ensure the technical standards of quality as well as the physical characteristics Levels can be considered negligible though may cause certain sedimentation phenomena. On the basis of the period and the planned upgrade plan outlined in chapter I, it is possible to find that the impact on water quality is negative; Insignificant, short-term and on a narrow area...

-With soil quality: the dig material falling in the process of transportation and construction only alter the face, the focus around the transportation route and neighboring lines do not change the soil characteristics, quality of soils.

-Air: With characteristic air quality zones construction of the dike glands currently quite fresh (see Evaluation Air Quality Chapter II) The impact of dust, smoke, exhaust in the construction process is negligible, mainly neighboring public sector , according to the consultant's expert on emissions and smoke group, this impact only occurs within 15 m... The area is under construction.

Impact on the ecosystem:

-Impact of dredging operation of the dedykes: increased turbidity, deterioration of water quality affecting aquatic and aquatic aquaculture operations: Quality Hau River water (at the gate of the dam Beach and Tran do Beach) and small channel ashore Sea dykes will be affected by dredging operations to obtain the construction material. Turbidity, pH and some other pollutant content in Hau River water (in the dredge area and the construction of the sewers) and small canals on the shore of the sea can be increased due to disturbed bottom mud during the dredge process. The quality of river water, the channel can also be impaired due to the impact of the surface flow generated from rainwater that pulls under material from the storage area flowing into the river, or by water leaking out from the temporary material collection beaches.

-Impaired water quality will negatively affect the aquatic life and aquatic aquaculture activities available in clusters along the dike. The impact can be controlled by means of construction (such as dykes in dredge areas, mixing lime for controlling the pH of water from the materials) presented in the outline of the dredge material management plan that will be invested Detailed design of the construction (instructions in Appendix 2) and the contractor will specifically establish this plan before proceeding.

-Impact on creature resources: When executing sea dike, Cham mangrove Forest is aware of the impact on flora and fauna in this area. Greenery, vegetation, aquatic, some wild animals, may be disturbed, hunted, harmed if they appear near the construction area if the workers lack consciousness and French understanding. Construction waste, waste from farm workers, especially toxic substances and plastic waste if removed or leaking into the area of mangrove forests, will be able to interfere with the growth of the aquatic species and the source of benefits Fisheries in the area. This risk is moderate and can be controlled because the number of workers is only limited, focusing only on a small number of areas along the construction line located in the buffer area of the mangrove forest.

Impact on community safety in social impacts:

-Disruption, disturbance of waterway traffic and road. Construction of the dike, 7 bridges and seven salt compartments on the dike would interrupt traffic route traffic on the dike during the construction period of 48 months. However, the project of construction in the form of the projection should each different time will affect each different road segment. Moreover, at 1 number of, both the inner and outer are agricultural activities, so the construction of the route will affect the need to move from the embankment out of the population. Bridge construction at the Thailand Square incision will affect the exchange of goods, the transportation of the back of the boat in the area. These impacts are moder (ii) Risks, incidents:

-Risk of slump, land slip causing safety loss: risk of sliding the roof in the absence of finishing, uncompacted stable jeopardizing workers and people present in the construction area. The risk of slipping in the rainy season is greater than during dry season. The difference between the old and new is + 0, 9m so the risk of land slippage will not be too big. This risk can be minimized, mitigation measures presented in the program.

-Safety and health risks for workers when working on High: 1 traffic bridge will be constructed at the Thailand Square channel (KM14 + 020). The bridge has an BTCT

structure, 3 beats (12.5 + 18.6 + 12.5) m, L = 45m, B = 3, 50m at high bridge construction positions can cause the risk of dropping construction materials into water or drowning when working on the water surface. When luminescent greenery, insects like centipedes, bees, ants... Can attack workers. These impacts are low and controllable, mitigation measures will be presented in the program.

-Safety risk for the community: at the area of construction of the drain, the road traffic by the material of temporary assignments, operation of construction machinery or materials, waste falling from above. Some small repair bridge risks are small and can be controlled.ate and controllable, mitigation measures will be presented in the program.

Table 3. 9. Special impact along the sea dike glands

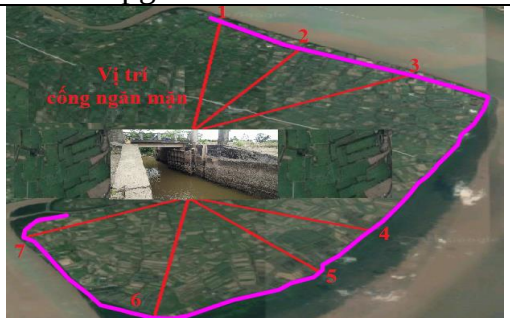
Location and activity	Subject to Impact	Specific impact
Km 0 Upgrade Mù U bridge, and paths. The bridge is repaired upper section like balustrade, on the bridge. Will swipe the sea dike with the Blind Bridge, replacing the target pile and the bridge, the repair of the balustrade, drop the sand slump to create the stone carpet combined with the stone reinforced the legs of the bridge. No impact on the foundation, the bridge.	 At the point of the sea dike at blind, this is also the upgrade position of U Blind Bridge. The vacuum is about 20m on the right hand, with 1 household living. High-pitched bridge. The surrounding is farmland and aquaculture ponds. The two sides of the glands have many shrubs and green landscapes.	+ Dust, smoke, noise from the operation of vehicles, construction machinery and solid waste arising from the activities of workers polluting the environment surrounding the population living. + Disturbance of residential communities, disruption of waterway traffic and roads to influence people's travel during construction period. + Plants, vegetation is damaged when luminescent strobe, or due to the temporary unloading of construction materials, waste + Risk Insect attack workers
Km 0 to Km 5 + 900 Upgrade of the dike, advanced high-peak process, surface dykes make use of road roads.	 The bank must be an agricultural production land of aquaculture	+ The dredge operation, which affects the water serving aquaculture service. + Disturbance of residential communities, disruption of waterway traffic and roads to influence people's travel during construction period. + The material, water can be

Location and activity	Subject to Impact	Specific impact
	ponds. On the left is the agricultural production land consisting of aquaculture ponds, wetlands with tree and canal species.	spilled to the pond damaging the crop or the mortar or affect the yield of aquaculture. + Loss of vegetation. + The risk of insect attack may cause injuries to workers.
K5 + 900 to KM22 + 454 Upgrade of the dike, advanced high-peak process, surface dykes make use of road roads.	 The right bank is the land for agricultural production including sugarcane and aquatic ponds. The left Bank is CU Lao Dung mangrove forest. Many shrubs in the area	+ The dredge operation, which affects the water serving aquaculture service. + The material at the temporary beaches, water can be spilled down into sugarcane or pond damaging crop or mortar or affect aquaculture productivity. + Disturbance of residential communities, disruption of waterway traffic and roads to influence people's travel during construction period. + Trees, some wild individuals may be harmful due to lack of conscious worker behavior. + Reduce the construction area green space. + Insects can inflict injuries to workers.
Upgrade positions Bridge (repair only, do not build new bridge)		
Mù U Bridge 2 (KM0) Upgrade Bridge blind 2, and paths. The bridge is repaired upper section such as balustrade, on demand and without impact on the foundation, the	 There are 1 population living in 20m toward the right hand and 50m from the path. Large path slope. During the upgrade, the project	+ Disturbance of residential communities, disruption of waterway traffic and roads to influence people's travel during construction period. + Dust, smoke, noise from the operation of vehicles, construction machinery and solid waste arising from the activities of workers polluting the environment surrounding the population living. + Plants, vegetation is damaged when luminescent

Location and activity	Subject to Impact	Specific impact
	owner will swipe the sea dike connection to the blind Bridge and the Shore Road that covers the status, replacing the pepper system and the bridge, refixing the balustrade, dropping the sand bag, making the stone carpet combination The foot of the bridge.	strobe, or due to the temporary unloading of construction materials, waste + Risk Insect attack workers
Bridge No. 1 (Km 0 + 400) Upgrade Bridge No. 1. The bridge is repaired upper section such as balustrade, on demand and without impact on the foundation.	There are 2 residents living on the foot of 10m towards the right hand and the 50m path towards the town. During the upgrade, the project owner will swipe the sea dike connection with the number 1 bridge and the Shore Road that covers the status, replacing the focus system and the bridge, and refixing the balustrade, at the sides of the bridge plate , flattened the bridge with concrete stone M300, at the position of the bridge (the direction of the head of the path) reinforced Taluy natural roof with 2 lines of original diameter crucibles (8 ÷ 10) cm, L = 4, 5m, layout 8 plants/M.	
Bridge No. 1 (Km 1+900) Upgrade Bridge No. 2. The bridge is repaired upper section such as balustrade, on demand and without impact on the foundation.	 The paths are pretty much green, and there are no households living near the bridge and the path. On the path there are gravel	+ Disturbance of residential communities, disruption of waterway traffic and roads to influence people's travel during construction period. + The risk of worker's safety when working on high above the water. + Dust, smoke, noise from the operation of vehicles, construction machinery and solid waste arising from the activities of workers polluting the environment surrounding the population living.

Location and activity	Subject to Impact	Specific impact
	soils.During the upgrade process, project owners will claw connecting sea dike connected to Bridge No. 2 and road embankments status quo, rather new system markers and signage bridgehead, refinishing railing, dropping sacks of sand to create carpeted roof stone gabions combined abutments reinforced leg.	+ Plants, vegetation can be damaged due to the temporary unloading of construction materials, waste and movement of workers, machinery + Safety risk for 2 households living near the foot of the bridge + Disturbance of residential communities, disruption of waterway traffic and roads to influence people's travel during construction period. + The risk of worker's safety when working on high above the water. + Reduce green space. + Trees, some wild individuals may be harmful due to lack of conscious worker behavior. + On-side paths with gravel stones increase the risk of sliding falling when up, down the slope bridge.
Bridge No. 3 (Km 3 + 500) Upgrade Bridge number 3, and path. The bridge is repaired upper section such as balustrade, on demand and without impact on the foundation, the	The paths are pretty much green, and there are no households living near the bridge and the path. There are a small number of children playing on the bridge. During the upgrade, the project owner will swipe the sea dike connection with Bridge No. 3 and coastlines present the status, replacing the target piles and bridge indicators, refixing the balustrade, at the surface of the bridge knit plates , flattened the bridge with concrete stone M300, at the position of the bridge (the direction of the head of the path) reinforced Taluy natural roof with 2 lines of original diameter crucibles (8 ÷ 10) cm, L = 4, 5m,	+ Disturbance of residential communities, disruption of waterway traffic and roads to influence people's travel during construction period. + The risk of worker's safety when working on high above the water. + Trees, some wild individuals may be harmful due to lack of conscious worker behavior. + Insects can inflict injuries to workers. + Safety risk for young children if present near the construction area.

Location and activity	Subject to Impact	Specific impact
	layout 8 plants/M.	
Bridge No. 4 (Km 3 + 900) Upgrade Bridge No. 4, and path. The bridge is repaired upper section such as balustrade, on demand and without impact on the foundation, the	 The paths are pretty much green, and there are no households living near the bridge and the path. During the upgrade, the project owner will swipe the sea dike connection with the number 4 bridge and the shore route that covers the status, replacing the focus system and the bridge, and refixing the balustrade, at the surface of the bridge plate , flattened the bridge with concrete stone M300, at the position of the bridge (the direction of the head of the path) reinforced Taluy natural roof with 2 lines of original diameter crucibles (8 ÷ 10) cm, L = 4, 5m, layout 8 plants/M.	+ Disturbance of residential communities, disruption of waterway traffic and roads to influence people's travel during construction period. + The risk of worker's safety when working on high above the water. + The impact on biodiversity due to worker behavior. + Trees, some wild individuals may be harmful due to lack of conscious worker behavior.
Bridge No. 5 (Km 18 + 500) Upgrade Bridge No. 5. The bridge is repaired upper section such as balustrade, on demand and without impact on	Both sides of the bridge are inhabited, with a closest distance of 50 m. Arable land runs along the path to the bridge about 200m. During the upgrade, the project owner will swipe the sea dike connection with the number 1 bridge and the Shore Road that	+ Disturbance of residential communities, disruption of waterway traffic and roads to influence people's travel during construction period. + The risk of worker's safety when working on high above the water. + Risk of traffic security when cattle (buffalo, cow...)

Location and activity	Subject to Impact	Specific impact
the foundation, the	covers the status, replacing the focus system and the bridge, and refixing the balustrade, at the sides of the bridge plate , flattened the bridge with concrete stone M300, at the position of the bridge (the direction of the head of the path) reinforced Taluy natural roof with 2 lines of original diameter crucibles (8 ÷ 10) cm, L = 4, 5m, layout 8 plants/M.	Crossing the path. + Disturbance of residential communities. + Construction materials can be spilled to the arable land.
Bridge No. 6 (Km 21 + 500) Upgrade Bridge number 6, and path. The bridge is repaired upper section such as balustrade, on demand and without impact on the foundation, the	 The paths are quite numerous shrubs and some trees, without the residents living near bridges and paths. During the upgrade, the project owner will swipe the sea dike connection connecting to the number 6 bridge and the Shore Road that covers the status, replacing the focus system and the bridge, and refixing the balustrade, dropping the sand cover to create stone carpet The foot of the bridge.	+ Disturbance of residential communities, disruption of waterway traffic and roads to influence people's travel during construction period. + The risk of worker's safety when working on high above the water. + Reduce green space + Green trees outside the scope of construction areas, some wild individuals may be harmful due to the behavior of lack of consciousness workers.
Salt-stopping drain will be upgraded		
The salt compartment drain will be upgraded at 1 + 300 Km positions (drain No. 1); Km 2 + 600 (tribute No. 2); Km 3 + 900		+ Disturbance of residential communities, disruption of waterway traffic and roads to influence people's travel during construction period. + Construction materials can be dropped from high risk endangering the person and

Location and activity	Subject to Impact	Specific impact
(drain No. 3); KM10 + 800 (drain No. 4), Km 12 + 700 (No. 5), KM16 + 400 (drain No. 6) and Km 18 + 570 (drain No. 7)	 	means of transport below.
The drain will be constructed		
The drain will be constructed at the locations of Km 1 + 200 (tribute No. 1 in R. He year) and Km 1 + 300 (tribute No. 2 at R. Mr. Seven); KM 2 + 100 (drain 3 at R. Deep), Km 2 + 150 (drain 4 at R. Khém) and KM2 + 700 (drain No. 5 at R. O.); KM 12 + 700 (drain No. 6), Km 3 + 400 (drain No. 7) and Km 16 + 300 (drain No. 8).		+ Disturbance, road traffic disruption. + Disturbance of agricultural production activities of the population. + Risk of sliding ground in the cliffs and roof. + Dirt when digging the soil during the dry season. + Dust, smoke, noise from the operation of vehicles, construction machinery and solid waste arising from the activities of workers polluting the environment surrounding the population living.
Underground Tribute is built		

Location and activity	Subject to Impact	Specific impact
The underground tribute will be constructed at the Rib Canal (Km 9 + 050)		+ Shuffle, road traffic disruption + Disturbance to the agricultural production activities of the people due to blocking of lines for construction. + Dirt when digging the soil during the dry season. + The risk of leg falls, occupational safety.
Bridge traffic is newly built		
Bridge traffic and paths will be constructed at the Thai Square channel (KM14 + 020)	 There are docks / marina temporary locals build a bridge near the location. Surrounded by lush, beautiful scenery and no residents nearby.	+ Disturbance of residential communities, disruption of waterway traffic to influence people's travel during construction period. + The risk of worker safety when working at height at the construction of the sewers, or the risk of drowning when doing construction on the water surface. + Chisel, influencing water quality of aquaculture. + Take some green plants and vegetation at the bridge site. + Lose the marina of local people. + Change local landscape of the area. + Green trees outside the scope of construction areas, some wild individuals may be harmful due to the behavior of lack of consciousness workers. + Insects can inflict injuries to workers. + The safety risk to the people when circulating on the river, on the roads when the construction machines operate + The noise due to piling affects workers and

Location and activity	Subject to Impact	Specific impact
		surrounding people. + Grease on the hammer machine, leak spills over polluting rivers.
Residential Location		
Km 18 + 500 Upgrade of the dike, advanced high-peak process, surface dykes make use of road roads.	At km 18 + 500, there are many residents living near the route, the closest distance from the house to the embankment about 20m. It is the only residential area on the sea embankment line. However, the population density is not crowded, the house is about 50m.   	+ Odor from dredging material + Disturbance of waterway and road traffic + Social disturbance due to focus workers. + The safety risk to the people when the material falls, slides close to the population, on roads or when the construction machinery operates. + Insects can inflict injuries to workers. + Dust, smoke, noise from the operation of vehicles, construction machinery and solid waste arising from the activities of workers polluting the environment surrounding the population living.

3.5.2. Special effects on the construction of river Embankment

A/summary of the peculiarity of the impact in the upgrading of the river dike:

Subject to impact: the agricultural ecosystem inside the island with the following crops and livestock are as follows: labels, sugarcane, shrimp... and objects engaged in construction, production in the affected area. Currently the quality of the environment in the impact range is rated as well: the surface water quality can be used for irrigation

irrigation to serve the people in the project area with the plants that can withstand alum and salty; Good groundwater quality, can supply water to serve the construction items, the targets of soil quality, sediment are lower than QCCP many times; The quality of the air environment around the project area of good quality, there are no signs of contamination.

In the process of executing the river embankment there are some special effects as follows:

b/Specific impacts and risks:

(i) Impacts: chemical – physical, biological and ecosystem, society and Community safety;

-Local flooding: when construction of land dams (soil structures, B = 3, 0m; high-peak finishing, peak = +3, 20m; roof coefficient m = 2.0) to weld the incisions in the incisions in closed areas of the small cells , the water may be locally folded. The impact will be controlled if the under-dykes and ditches are constructed before welding the incisions during the construction process.

-Affecting aquaculture activities due to the water quality of the circular tincture (19, 522km), the Ben Ba River (11, 242km) and the Ho Vam Lon (9, 128km) are impaired due to the dredging activities, construction of dike, sewers and land dams. The water quality of the Tincture River, Ben Ba River and the Ho Vam Lon can be impaired due to the dredging impact, of dredging the sludge, blocking the flow of circulation, rain water flowing through the storage areas of materials , infiltration of domestic wastewater from the farm workers, thereby affecting the aquaculture operations along the dike. This impact is similar to the effect of upgrading the sea dike gland and will also be controlled through the outline of the Curettage management plan (design detailed construction consultancy, instruction in Appendix 2) and is detailed by the contractor of the Public.

-Odor arising from dredging operation to obtain the construction land of 39.892 km of river dike, digging pits 4 subterranean sewers and 37 drains, from storage of peach land on the non-dike storage space. Odor that will cause discomfort to people in the project area, especially at Ben be market area, An Minh Pagoda, cu Lao Dung General Hospital... This impact will be controlled by specific mitigation measures in the construction positions presented in the Environmental management Plan chapter.

(ii) Risks, incidents:

- Incidents of slump, slip-off at the waterfront, construction area and the roof of the river dike can occur during construction due to various reasons. This risk can affect the assets and health of workers and people in the region. This impact is moderate and can be controlled.

- Sensitive subjects located along the river dike include the General Hospital of Cu Lao Dung District, Doan van Thi High school, An Minh Pagoda, Dai An secondary School, Ben May market, and district of Cu Lao Dung district. These subjects could be influenced by dust, exhaust, noise and crowd-centered workers. This impact will be

controlled by specific mitigation measures in the construction positions presented in the Environmental management Plan chapter.

Table 3. 10. Specific impacts of the river dike

Location and activity	Subject to Impact	Specific impact
Ben Ba River Dike		
Km 0 – Km 3 + 700 Build New River embankment glands in the area.	2 on the river there are long stretches of shrimp ponds along the line. About 100-200m from the shores of farmland, sugarcane. 	+ The dredge operation, which affects the water serving aquaculture service. + The material, water can be spilled to the label, sugar cane or pond affected the aquaculture yield. + The risk of sliding the roof at the high, uncompacted stable.
KM 3 + 700 to Km 4 + 100 Building New River embankment glands in the area	This passage through the town of Cu Lao Dung should focus many populations. School Time (daily) students in schools and political training centres may be affected. 	+ odors from dredging operation. + the waterfront incident. + risk of sliding the roof of the levees when high, yet stable compacted. + social disturbance due to centralized workers. + materials and construction machines temporary files can affect the landscape, the area of the town. + dust, smoke, noise from the operation of vehicles, construction machinery and solid waste arising from the activities of workers polluting the environment surrounding the population living. + disturbance risks, traffic disruption and traffic safety if the construction

Location and activity	Subject to Impact	Specific impact
		operation has a narrowing of part of the roads in some town center passages.
At KM3 + 700 Building New River embankment glands in the area	Across the river there is a general hospital in Cu Lao Dung district. The disease is prone to influence from small impacts such as dust, noise arising from the construction process. 	+ odors from dredging activity + disorderly due to centralized workers influencing people's resting processes. + noise from the construction works. + dust when digging the soil during the dry season. + Solid wastes arise due to the activity of workers polluting surrounding populations.
At Km 3 + 800 Building New River embankment glands in the area	There is a High school across the river. School Time (daily) students in schools may be impacted. 	+ odors from dredging activity + disorderly due to focus workers influencing the learning process of pupils. + noise from the construction of the dike glands. + language, inappropriate behavior of workers can affect pupils.
	The opposite shore of the 150m route is An Minh Pagoda 	language, inappropriate behavior of workers can affect the reverence of pagodas, especially on the full day, the 1st day and the holidays as Vu Lang... odors from dredging operation affect the temple door operations. The noise from the construction works.
	It is a 300m from the coast opposite Đại Ân primary school.	+ odors from dredging operation.

Location and activity	Subject to Impact	Specific impact
	School Time (daily) students in schools may be impacted 	+ language, inappropriate behavior of workers can affect pupils.
At Km 4 + 100 Building New River embankment glands in the area	Across the street from Ben Ba Market 	+ odors from dredging activity + disorderly due to centralized worker can cause the brawl not worth it. + noise from the construction works. + dust when digging the soil during the dry season.
KM 4 + 100 – Km 19 + 522 Building New River embankment glands in the area	 2 on the river there are long stretches of shrimp ponds along the line. The coast is about 100-200m from the farmers ' farmland.	- Dredging operation, affecting aquatic activities serving aquaculture - Risk of sliding the roof of the levees when high, yet stable compacted. + Dirt when digging the soil during the dry season. + Insects can inflict injuries to workers. + Grease on the hammer machine, leak spills over polluting rivers.
At Km 6 + 400 Building New River embankment glands in the area	From the shore towards the northeast about 450m in Nguyen Thong Minh A, An Thanh Dong Commune has the President Ho Chi Minh.	+ Language, inappropriate behavior of workers may affect the reverence of the temple, especially on holidays such as 19/5, 22/12, 27/7.... + Odor from dredging operation to affect the

Location and activity	Subject to Impact	Specific impact
		temple's activities
At Km 7 + 600: Building New River embankment glands in the area	From the coast, there are 1 temple in Pham Thanh than Hamlet, An Thanh 2 commune 	+ language, inappropriate behavior of workers can affect the reverence of pagodas, especially on the full day, the 1st day and the holidays such as the Vu lang ceremony. + Odor from dredging operation to affect the activities of the Temple
Con Tron River Dikes		
Km 0 - Km 8+200 Building New River embankment glands in the area	 2 on the banks are mainly shrimp ponds and the waterfront way about 100m is the agricultural production land of the people. The population is sparse on the vertical banks, which are only vacant, and the land produces no inhabitants.	+Dredging operation, affecting aquatic activities +Serving aquaculture risk of sliding the roof of the levees when high, yet stable compacted. +Green trees outside the scope of construction areas, some wild individuals may be harmful due to the behavior of lack of consciousness workers. + Dirt when digging the soil during the dry season.
From km 8 + 200 to km 8 + 400 Building New River embankment glands in the area	 The area, which concentrated in the population, forms a residential cluster of	+Odors from dredging activity +The waterfront incident. +risk of sliding the roof of the levees when high, yet stable compacted. +social disturbance due to centralized workers. + Change local landscape of the area. + The noise of digging

Location and activity	Subject to Impact	Specific impact
	over 50m from the bank of the CU Lao Dung district.  	machine affects workers and surrounding people. + Grease on the excavant leak on polluting river.
From Km 8 + 400 to Km 11 + 242 Building New River embankment glands in the area	2 on the banks are mainly shrimp ponds and the waterfront way about 100m is the agricultural production land of the people. The population is sparse on the vertical banks, which are only vacant, and the land produces no inhabitants. The time at which political agencies were affected was mainly the administrative hours. In this passage at Km 10 + 300 There is a traffic bridge  	+Dredging operation, affecting aquatic activities serving aquaculture +Risk of slippage at the high, uncompacted yet stable + Insects can inflict injuries to workers. + Grease on the hammer machine, leak spills over polluting rivers.
VAM Big Lake River Dike Building New River embankment glands in the area	The land of dikes are mainly farmland and aquaculture. Two sides of the embankment are sparsely populated and separated from each other.  	+ Dredging operation, affecting aquatic activities serving aquaculture + Risk of sliding the roof of the levees when high, yet stable compacted. + Insects can inflict injuries to workers.

Location and activity	Subject to Impact	Specific impact
Location of new construction of underground drain	 The construction location of the sewer is small, the surrounding is farmland. The area has many greenery and green vegetation.	+ The operation to block the construction of the sewer leads to local flooding. + Scrambling vegetation and lost some greenery + Land digging operations for construction of the sewers will scrambling mud underwater, affecting water quality in the construction area. + Odor from the pit operation will affect people's living life. + Incidents such as river-bank slippage, construction area sewers on the river.
Location of new construction of the drain	 The location of the construction of the drain is small incisions, the surrounding is farmland.	+ Operation blocks the flow to the construction of the drain resulting in local flooding. + Earthwork to execute the sewers will scrambling mud underwater, affecting water quality in the construction area. + Odor from the nail pit activity. + Incidents such as river-bank slippage, construction area sewers on the river.
New construction location of ground dams		+The construction of land dams is a local flooding +Problems such as jumping on the shore when you have high, yet stable compacted. +Llost the marina of the local people. +Some trees will be cut off to get the construction ground. + Disturbance, disruption of waterway traffic.

Location and activity	Subject to Impact	Specific impact
	Location of the local residents. Around there are many trees and some shrubs.	+ Insects can inflict injuries to workers.

3.5.3. Special impact on route and Traffic bridge construction

a/Summary of the peculiarity:

Subject to impact: residential communities and objects involved in construction and production in the affected area. Currently the quality of the environment in the impact range is rated as well: the surface water quality can be used for irrigation irrigation to serve people in the project area with plants that can withstand alum and salty. Water in this area needs to be further processed to ensure use for living; Good groundwater quality, can supply water to serve the construction items, the targets of soil quality, sediment are lower than QCCP many times; The quality of the air environment around the project area of good quality, there are no signs of contamination.

b/Specific impacts and risks:

(i) Impact: chemical – physical, biological and ecosystem, society and Community Safety

-Noise: From the construction operation of the route, especially the pile operations at the building positions will affect the health and spirit of the people around the construction area and labor workers. Noise will also affect the teaching and learning activities at schools, fun activities and lunch breaks of kindergarten at the street including the political Enrichment Center, the Center for Education regularly – vocational training Cu Lao Dung. , SECONDARY an Thanh 3, THPT an Thanh 3 campus 1, THPT An Thanh 3 base 2... However, these impacts are moderate and can be controlled with the safety measures, the maintenance of high-test machinery and workwear are presented in the management program.

The reconstruction of the bridge in the provincial route 933B will cause disruption of traffic when the existing bridge is demolishing to build new bridge. The increase in the number of machinery, equipment and vehicles on the route will increase traffic risks such as obscuring the people's vision, the risk of collisions between the means of the project and of the people. At the same time, the construction of the route also increases the risk of traffic accidents due to the construction materials to be horizontal on the road, the components of the uncompleted construction route can be dangerous to the population , especially at night. This impacts on average and can be controlled by specific mitigation measures in construction positions presented in the Environmental management Plan chapter.

-Reduce the income of small households along the route, especially in the area of Cu Lao Dung town (Ben do Market), the area of Rach Gia. Dust arising during the construction process can reduce the amount of guests in stores, especially the food and beverage outlets that lead to a decrease in the income of households. In addition, the construction of the barrier area to work will affect the trading of the households blocked by the barrier. This impact will be controlled by specific

mitigation measures in the construction positions presented in the Environmental management Plan chapter.

-Sensitive subjects when executing the 933B route is 3 residential areas on the shipping route – Figure 1.18), An Thanh High School 3, An Thanh 3B Primary School, An Thanh Elementary School 1 , People's Committee of An Thanh 3, Ben Ba market, cu Lao Dung town area. These subjects are affected by the impacts of road construction such as dust, noise, traffic accident risk, social impact due to crowd-centered workers. This impact will be controlled by specific mitigation measures in the construction positions presented in the Environmental management Plan chapter.

(ii) Risks, incidents

-Shuffle traffic and increase the risk of traffic safety on the route. The transport, unloading and temporary files of machinery, construction materials, waste along the 933B route can be disrupted and increase traffic safety risks. The increase in the number of machinery, equipment and vehicles on the route will increase traffic risks such as obscuring the people's vision, the risk of collisions between the means of the project and of the people. At the same time, the construction of the route also increases the risk of traffic accidents due to the construction materials to be horizontal on the road, the components of the uncompleted construction route can be dangerous to the population , especially at night. At a narrow line, both sides of the road are residential clusters, arable land or canals with ground altitude present in significantly lower segments than the road surface so when there are 2 vehicles avoiding each other on the road will also ease traffic congestion , increase the risk of traffic accidents. This risk is high during the sugarcane harvest period and during the time the student comes to school and is Tan school. This impact will be controlled by general and specific mitigation measures in the construction positions presented in the mitigation measure program.

-The reconstruction of the bridge in the provincial route 933B will cause disruption of traffic when the existing bridge is demolishing to build new bridge. Due to the route 933B is the unique route, the impact on the average can be controlled by constructing temporary bridge to ensure traffic in bridge rebuilding positions.

-Reduce the income of small households along the route, especially in the area of Cu Lao Dung town (Ben do Market), the area of Rach Gia. Dust arising during the construction process can reduce the amount of guests in stores, especially the food and beverage outlets that lead to a decrease in the income of households. In addition, the construction of the barrier area to work will affect the trading of the households blocked by the barrier. This impact will be controlled by specific mitigation measures in the construction positions presented in the Environmental management Plan chapter.

-Sensitive subjects when executing the 933B route is 3 residential areas on the shipping route – Figure 1.18), An Thanh High School 3, An Thanh 3B Primary School, An Thanh Elementary School 1 , People's Committee of An Thanh 3, Ben Ba market, cu Lao Dung town area. These subjects are affected by the impacts of road construction such as dust, noise, traffic accident risk, social impact due to

crowd-centered workers. This impact will be controlled by specific mitigation measures in the construction positions presented in the Environmental management Plan chapter.

Special impact along the provincial route 933B and bridge construction positions are presented in the table below:

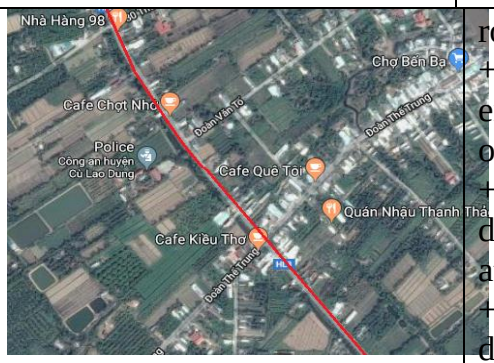
Special impact along the provincial route 933B and bridge construction positions are presented in the table below:

Table 3. 11. Special impact along the provincial route 933B

Position	Location and activity	Subject to Impact	Specific impacts and risks
1	KM 9 + 974,46 to 11 + 854,48: This section has a sparsely populated population, the closest distance between 2 households is 50m, the two are mainly farmland planted with coloured flowers, sugarcane, without aquaculture ponds.  		+ Soil digging, temporary set material during road construction can spill into the flowers, sugarcane damaging. + Workers can freely customize branches, picking fruit. + 2 vehicles avoiding each other on the road will also ease traffic congestion, increase traffic accident risk. + Disturbance of agricultural production activities of people due to the unconvenient transportation activities. + Risk of traffic security when cattle (buffalo, cows...) Crossing the road.
	At Km 11 + 200 Upgrading routes in the region	On the left there is district Cu Lao Dung line 100m route 	+Dust, waste and building materials can cause loss of regional cosmetics. +noise from the route exam operation. +increasing the number of machines, equipment and means of transport on the route will increase the risk of traffic

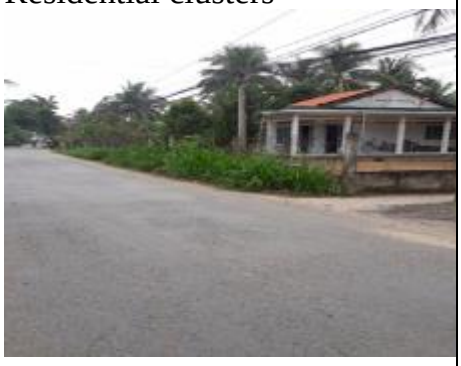
Position	Location and activity	Subject to Impact	Specific impacts and risks
	At Km 11 + 800 Upgrading routes in the region	 The right side of Cu Lao Dung's political enrichment Center is a 120m route, where academic and enrichment staff are on political reasoning under programs built by the center, basically the time it is in the administrative hours	-Traffic on the road to school can be disturbed, increase the risk of traffic safety, especially in time to class and Tan school -Dust, waste and building materials can cause the loss of regional cosmetics. -Noise will also affect the teaching and learning activities. -Language, inappropriate behavior of workers may affect students.
2	**From Km11 + 854,48 to km 25 + 550**		
	From Km 11 + 854,48 to Km 12 + 500 Upgrading routes in the region	This section is sparsely populated, with the closest distance between two households being 50 m. Around being farmland (longan) 	+ earthwork, temporary set material during road construction can spill into the field damaging the Logan. + workers can freely discretionary the spike, picking fruit. + disturbance of the agricultural production of the people due to the unfavorable transport operation. + Risk of traffic security when cattle (buffalo, cows...) Crossing the road.
	At km 12 + 100 Upgrading routes in the region	 600m left with Cu Lao Dung General Hospital	+ disorderly due to centralized workers influencing people's resting processes. + dust, waste and building materials can cause loss of regional aesthetics. + Increasing the number of machinery, equipment and transport vehicles on the route will increase the risk of traffic

Position	Location and activity	Subject to Impact	Specific impacts and risks
	At Km 12 + 200 Upgrading routes in the region	 It is about 600 meters from the left hand with the Doan Van To HIGH School, 300m to the left with Dai Ân 1 elementary School. All day of the week.	+ Traffic on the road to school may be disturbed, increase the risk of traffic safety, especially in time to class and tan school. + Noise affecting the teaching and learning. + Increased risk of traffic accidents due to the construction materials to be horizontal on the road, the components of the uncompleted construction route can be dangerous to the population, especially at night.
		 450m from the left is An Minh Pagoda. The time to concentrate is crowded on the 1st, the day and the holidays, such as Buddhist ceremony, Vu Lang ceremony.	+ language, inappropriate behavior of workers can affect the reverence of pagodas, especially on full day, Day 1 and holidays as holidays. + Traffic on the road to the temple can be disturbed, increasing the risk of traffic safety, especially on the full day, the 1st day and the holidays as the ceremony.
	At KM12 + 350 Upgrading routes in the region	 On the right side there is a public safety Cu Lao Dung 100m route, the workplace of political organizations with working time in the hours of administration.	-Dust, noise, waste and building materials can cause loss of regional fine -The increase in the number of machines, equipment and means of transport on the route will increase the risk of traffic
	Km 12 +	Residential concentration and many live 2 side traffic online.	+ Dust, noise affecting households and households on the side of the

Position	Location and activity	Subject to Impact	Specific impacts and risks
	500 to Km 12 + 904,48 Upgrading routes in the region	   	road + Obstruct, disturbance of the entrance to the house and works on the road + Risk of accidents in the deep digging to execute the sewer route at the crossroads. + Weak construction of deep digging pits can be sunk, cracked. + Increasing the number of machinery, equipment and transport vehicles on the route will increase traffic risk. + 2 vehicles avoiding each other on the road will also ease the traffic jam, increase the risk of traffic accidents, the risk is high during the transport of construction material machinery and in the morning and afternoon time intervals. + Influence on trading of the households blocked by the barrier.

Position	Location and activity	Subject to Impact	Specific impacts and risks
	At Km 12 + 600 Upgrading routes in the region	 Left side 600 from Ben Ba Market	+ Traffic on the road to the market can be disturbed, increase the risk of traffic safety, especially during morning and afternoon peak hours. + Dust, noise, waste and building materials can cause loss of regional aesthetics.
		 On the right of 900m there is the People's Committee of Cu Lao Dung District, the workplace of political organizations with working time during the administration hours.	-Dust, noise, waste and building materials can cause loss of regional aesthetics. -The increase in the number of machines, equipment and means of transport on the route will increase the risk of traffic
	Km 12 + 904,48 to km 25 + 550 Upgrading routes in the region	Two sides of the road are cultivated land (sugarcane, logan), aquaculture ponds, sparsely populated living  	+ hampers the operation of transporting materials and agricultural products when the road surface is disturbed, especially at the intersection positions with horizontal lines + materials and waste that can spill into the cultivated land of the population causing damage to crops, congestion of drainage + check high-altitude to about 30cm, so do not hinder people's travel and down. + waste, construction materials can be spilling down causing crop damage, congestion of drainage + some passages near the route have small channels. However during the construction process, limiting the falling material should not affect the canals glands.

Position	Location and activity	Subject to Impact	Specific impacts and risks
			
	At Km 13 + 950 Upgrading routes in the region	The left side has the center for regular education – vocational schools of CU Lao Dung with the school all day of the week. 	+ Traffic on the road to school may be disturbed, increase the risk of traffic safety, especially in time to class and Tan school + Dust, waste and building materials can cause loss of regional aesthetics. + Noise will also affect the teaching and learning activities.
	At Km 14 + 164 Upgrading routes in the region	 The left side has a Martyrs ' cemetery in Cu Lao Dung	Dust, waste and construction materials can cause loss of regional fine
	From Km 16 + 900 to Km 17 + 100 Upgrading routes in the region	 Residential clusters	+ Dust, noise affecting the households + Obstruct, disturbance of the entrance to the house and works on the road + Risk of accidents in the deep digging to execute the sewer route at the crossroads. + Weak construction of deep digging pits can be sunk, cracked + Impact on existing infrastructure in the area such as power lines and other objects such as road-digging ditches, road-green plants
	Km 17 + 100	There are 1 pagodas around 450m from the road. The time	+ language, inappropriate behavior of workers can affect

Position	Location and activity	Subject to Impact	Specific impacts and risks
	Upgrading routes in the region	to concentrate is crowded on the 1st, full day, the big holidays of the year. 	the reverence of pagodas, especially on full day, Day 1 and holidays as holidays. + Traffic on the road to the temple can be disturbed, increase the risk of traffic safety, especially in the full moon, the 1st day and the holidays as the ceremony.
	Km 19 + 000 to Km 19 + 100 Upgrading routes in the region	Residential clusters 	+ Dust, noise affecting the households + Obstruct, disturbance of the entrance to the house and works on the road + Risk of accidents in the deep digging for construction. + Weak construction of deep digging pits can be sunk, cracked + Impact on existing infrastructure in the area such as power lines and other objects such as road-digging ditches, road-green plants
	KM 20 + 400 to Km 21 + 200 Upgrading routes in the region	Residential clusters 	+ Dust, noise affecting the households + Obstruct, disturbance of the entrance to the house and works on the road + Risk of accidents in the deep digging for construction. + Weak construction of deep digging pits can be sunk, cracked + Increasing the number of machinery, equipment and transport vehicles on the route will increase the risk of traffic
	Km 21+300 to Km 21+600 Upgrading routes in the region	Residential clusters	+ Dust, noise affecting the households + Obstruct, disturbance of the entrance to the house and works on the road + Risk of accidents in the deep digging for construction.

Position	Location and activity	Subject to Impact	Specific impacts and risks
			+ Weak construction of deep digging pits can be sunk, cracked + Impact on existing infrastructure in the area such as power lines and other objects such as road-digging ditches, road-green plants + Increasing the number of machinery, equipment and transport vehicles on the route will increase the risk of traffic
	Km 23 + 600 Upgrading routes in the region	It is about 600m from Wath Kós Tung Pagoda. 	+ language, inappropriate behavior of workers can affect the reverence of the pagoda, especially in the full moon, the 1st day and the holidays such as the Feast, the Lotus ceremony... Traffic on the road to the temple can be disturbed, increase the risk of traffic safety, especially in the full moon, the 1st day and the holidays as the ceremony.
3	From Km 25 + 550 to Km 26 + 719,22 Upgrading routes in the region	The land is dominated by agricultural land (sugarcane planting) and aquaculture (shrimp). 	+ Earthwork, temporary set material during the construction of sugar can be spilled down to the field damaging sugarcane. + Workers can be self-arbitrary with strict cane + Affects sugarcane transportation on harvest months (SEP) + Soils, falling materials can affect the quality of water in shrimp ponds causing damage to aquaculture farming
	Km 25 + 600 Upgrading routes in the region	The road is about 40m with An Thanh Health Station 1. 	+ Dust, noise can affect the patient, especially at noon and night time. + Obstruct traffic at the health station portal + Increased risk of traffic accidents caused by construction materials to be horizontal on the road, the components of the unsuccessfully completed route

Position	Location and activity	Subject to Impact	Specific impacts and risks
			can be dangerous to the population, especially at night
	At Km 27 + 300 Upgrading routes in the region	On the left side there is An Thanh Commune 3 ways 200m route 	Dust, waste and construction materials can cause loss of regional fine + the language, inappropriate behavior of workers can affect employees. + increasing the number of machines, equipment and means of transport on the route will increase traffic risks.
	At km 27 + 400 Upgrading routes in the region	The left side has gasoline plants about 30m. 	-Dust, waste and construction materials can cause loss of regional cosmetics -The increase in the number of machines, equipment and means of transport on the route will increase the risk of traffic. -Explosion-proof operation of the machines has increased risk of explosion risk with petrol station.
		An Thanh High School 3 building 2 on the left hand, the road, the duration of study on weekdays. 	+ traffic on the road to school may be disturbed, increase the risk of traffic safety, especially in time to class and Tan school + dust, waste and building materials can cause loss of regional aesthetics. + noise will also affect the teaching and learning activities. + language, inappropriate behavior of workers can affect pupils.

Position	Location and activity	Subject to Impact	Specific impacts and risks
	At 27 + 900 Upgrading routes in the region	The right side has Rach Trang church about 300m. 	+ Language, inappropriate behavior of workers can influence the reverence of, especially Easter Church, solemn... Traffic on the ramp to the church can be disturbed, increase the risk of traffic safety, especially Easter, weighted...
	At km 28 + 050 Upgrading routes in the region	Right there is rach coated market, near the route.	+ Traffic on the road to the market can be disturbed, increase the risk of traffic safety, especially during morning and afternoon peak hours. + Dust, noise, waste and building materials can cause loss of regional fine
	At Km 28 + 100 Upgrading routes in the region	To the 50 road there are post office Rach Dien, 	Dust, waste and building materials can cause loss of regional aesthetics. -The increase in the number of machines, equipment and means of transport on the route will increase the risk of traffic.
		An Thạnh 3 High school, learning time on weekdays 	+ traffic on the road to school may be disturbed, increase the risk of traffic safety, especially in time to class and Tan school Dust, waste and building materials can cause loss of regional aesthetics. + noise will also affect the teaching and learning activities. +
4	From Km 26 + 719,22 to		_ soil, falling materials can affect the quality of water in shrimp ponds causing damage to

Position	Location and activity	Subject to Impact	Specific impacts and risks
	Km 30 + 233,51 Upgrading routes in the region	 The land cultivation area is dominated by agricultural land (sugarcane) and aquaculture.	aquaculture farming _ earthwork, temporary set material during the construction of sugar can be spilled down to the field damaging sugarcane. _ workers can be self-arbitrary with strict cane _ affects sugarcane transportation on harvest months (SEP)
5	**Route avoidance**	 Route avoidance: Around the route area avoiding mainly farmland and there are a number of aquaculture ponds of the population.	+ soil, falling materials can affect the quality of water in shrimp ponds causing damage to aquaculture farming + earthwork, temporary set material during the construction of sugar can be spilled down to the field damaging sugarcane. + workers can be self-arbitrary with strict cane Affects the transport of sugarcane in the months of Harvest (Sept.).

Table 3. 12. Special effects in 9 traffic bridge construction positions

Position	Bridge's name /Location	Snapshot of status	Specific impact
1	Rạch Vượt Bridge: Km3+026	 The land area is dominated by agricultural land, and there are a number of households living in the field.	+ dust, noise affecting the households + obstructing, shuffling the entrance to the house and works on the sides Affecting existing infrastructures in areas such as power lines and green trees
2	Rạc Đình Trụ Bridge: Km12+25	The land area is dominated by agricultural land, and there are a number of households living in the field.	+ Dust, noise affecting the households + Obstructing, shuffling the entrance to the house and works on the sides + Affects existing infrastructures in areas

			such as power lines and evergreen trees + water quality on aquaculture ponds near construction location
3	Rạch Dầy Bridge: Km17+276	Around the construction location of the bridge there is a living 	+ Dust, noise affecting the households. + Water quality on aquaculture ponds near construction location
4	Rạch Lớn Bridge: Km17+808	Around the site of construction of bridge mainly farmland, some shrimp ponds and populations are sparsely inhabited. 	+ Dust, noise affecting the households + Water quality on aquaculture ponds near construction location
5	Rach Ba Chu Bridge : Km18+351	 Around the site of construction of bridge mainly farmland, some shrimp ponds and populations are sparsely inhabited.	+ dust, noise affecting the households + water quality on aquaculture ponds near construction location + affects existing infrastructures in areas such as power lines and evergreen trees

6	Rạch Ngay Bridge: Km20+39	 Around the site of construction of bridge mainly farmland, some shrimp ponds and populations are sparsely inhabited.	+ dust, noise affecting the households + obstruction, disturbance of entrance + affects existing infrastructures in areas such as power lines and evergreen trees Quality water input for aquatic ponds near construction location
7	Ba Keo Bridge:Km21+998	 Around the site of construction of bridge mainly farmland, some shrimp ponds and populations are sparsely inhabited.	+ dust, noise affecting the households + affects existing infrastructures in areas such as power lines and green trees Quality water input for aquatic ponds near construction location
8	Rach Dui Bridge:Km28+640.69	 Around the site of construction of bridge mainly farmland, some shrimp ponds and populations are sparsely inhabited.	+ dust, noise affecting the households + water quality on aquaculture ponds near construction location
9	Rach Trang Bridge: Km0+530	Locations around bridge construction mainly agricultural land (under sugarcane) 	Dust, noise affecting the households

3.5.4. Special effects on electrical construction

a/ <u>Summary of the peculiarity:</u>

Subject to impact: residential communities and objects engaged in construction and production in the affected area. Currently the quality of the environment in the impact range is rated as well: the surface water quality can be used for irrigation irrigation to serve people in the project area with plants that can withstand alum and salty. Water in this area needs to be further processed to ensure use for living; Good groundwater quality, can supply water to serve the construction items, the targets of soil quality, sediment are lower than QCCP many times; The quality of the air environment around the project area of good quality, there are no signs of contamination.

b/Specific impacts and risks: According to the World Bank's environmental, health and Safety guidelines (EHSG), the special impacts of power transmission and distribution line construction include :

+ Arise waste at construction site;

+ Erosion, land drop from deep-dug pit pits

+ Dust

+ the noise from trucks and heavy equipment

+ Shuffle Ground

+ Magnetic Zone and Power

+ Safety risks for workers when executing on the new construction project of 22kV lines, lines and substations of low voltage, the volume of waste arising at each column and risk of land slippage is only at a small level and for the local nature. Background conditions described in Chapter 2 show that the line is mainly passing through cultivated land and aquaculture ponds so electrical safety corridors (2 m for 22Kv lines) in accordance with the provisions of the Government Decree No. 14/2014/ND-CP) should Ground dressings will be insignificant and are only local, and do not cause a significant transformation to terrestrial and underwater habitats.

A temporary power cut will be required in the process of connecting the new system to the existing system. The electric cut will cause some disturbance in the living, production of the people, however the duration of relatively short electric cutting, only a few voices.

The special impact on electrical construction is mainly the risk of occupational safety. In this activity, the workers must execute on high, if not careful sliding foot, missed hands... That will affect health, even the life of workers. In addition, the non-compliance with electrical safety will also pose a danger to workers ' lives.

Shipping by waterway the materials: electric poles, bulky coils... Will increase traffic risks such as obscuring the people's vision, the risk of collision between the means of the project and the People's

These impacts and risks can be controlled by minimizing the impact presented in ECOP.

3.6. Negative impact on the operating phase

The impact of the construction of the dike glands

When SUB-PROJECT enters operations, environmental incidents and risks may occur, including:

(i) When SUB-PROJECT enters into operation, the main environmental issue of the construction of the river Dike is a change in the flow regime, the hydrological regime of the river dike and the sea embankment. During the rainy season, the water from the upstream will be further downstream and more (rather than flowing to two shores) pressure on the banks of the downstream river. However, water pressure on the downstream roof will also remain in control due to the investment project on the river on the entire line from upstream to sea. Thus, the construction of the river dike will not increase the risk of flooding in the rainy season. .

(ii) The influence of the construction of water to serve the purposes of different water has been taken into and disposed of in feasibility studies and technical design. With the construction of drains along the dike, the flow into the community will be maintained and water-taking activities will be carried out through the sewer and system of existing community canals.

(iii) to affect road traffic:

-After upgrading the road 933B and 09 Bridge completed, the traffic through here is expected to increase. In the operational phase, the most risky locations in traffic safety include: the residential area of Rach coated, passage through the town of Cu Lao Dung, the buttons for crab bends, ramp up and down the bridge, passage through the market , road into Ben Ba Market, school; ...

-The risk of traffic safety in the operating phase can also be minimized in part through design measures such as the slope design of the paths on the bridge below the current slope, placing the roadblocks on the sides of the slope on the bridge , placing the traffic alerts on the drain and bridges. In the operational phase, local governments need to be active people strictly executive traffic rules, use transportation to ensure quality... These impacts are rated at an average and can be controllable.

(iv) Waterway traffic influence

When building sewers, part of the cross section of some channels will be narrowed and can interfere with the transfer of sugarcane or other agricultural products in the region. Influence on the waterway traffic of the construction can be controlled through design solutions presented in ESMP.

B. Non-Works categories

The specific impact of forest planting

a/summary of the peculiarities of the impact in the planting of forests:

Range and subject to impact, characteristics of background environmental components:

Scope of impact: on the basis of the peculiarities of the investment category, the specialist team performs environmental and social impact assessment determines the extent of the influence of this investment include:

(i) the entire area of the Dykes (2 sides) for about 200 m for the population and about 50 m for the cultivation ponds, outside this range the environmental impact is negligible,

(ii) The area is approximately 1-7 km from the building material transportation route.

Subject to impact: wetlands on which there exist mangrove forest ecosystem outside the dike, especially interested in the area of monkey conservation from specific descriptions on the map. The agricultural ecosystem inside the island with the following crops and livestock is as follows: shrimp, labels, sugarcane... And the objects involved in the construction and production in the affected area stated. Currently the environmental quality within the impact is rated as well: the quality of river water can be used for irrigation irrigation to serve the people of the project area with the plants that can withstand alum and salty. Water in this area needs to be further processed to ensure use for living; The indicators of soil quality, sediment are much lower than QCCP; The quality of the air environment around the project area of good quality, there are no signs of contamination.

b/specific impacts and risks

Forest Plantation activity is the addition of, pluggable trees into sparse forest ranges. Co-planting, restoring forest will not use a lot of chemicals, pesticides, herbicides, growth stimulant... However, the cultivation of more subplants can lead to pests that develop or cause other impacts on biodiversity related to the penetration of foreign species and invasive species. These species are able to penetrate the additional planting area if in seedlings and seeds, plants, and roots... of such species. However, this risk is considered small because the government has built a number of processes, standards related to this issue and will be applied in the process of project implementation. The additional crops will focus on indigenous trees and/or species with existing plants in the area, the quality of the seedlings must be tightly controlled to avoid contamination of the harmful species.

The presence of workers can make some animal panic (especially monkeys) or the number of individuals who can be hunted. However, this risk is negligible that the number of workers and the time workers are present in the area are very limited, mainly they are only present in the existing sparse forest areas, far from the core of the forest. This risk can be minimized to the lowest level of popularity, adoption and monitoring of the implementation of the Code of Workers ' conduct.

The specific impact of the physiological models

The model of aquaculture under the canopy is mainly the natural farming method, so it is expected not to put on chemicals or foods that only drop breeding. Thus affecting the environment is very limited. However, the inclusion of children can cause the risk of developing disease, this issue should be noted from the control of the breeding quality and closely monitored during implementation.

For the farming and breeding patterns on agricultural land, the issue of using chemical protection, waste and sewage, including agricultural byproducts, will be the main problem. Solid waste that includes bottles, animal feed packaging, poultry packaging for breeding, fertilizer bag, antiseptics,... Some hazardous waste such as needles, medicine bottles, and so on. Mainly arise in the area of the households applying the Model 6 and model No. 7. These wastes if not collected will cause the loss of neighborhood customs, environmental pollution, obstruction of canals....

Waste water arising from the pilot model of the biological model consists of wastewater from livestock and wastewater operations from aquaculture.

Waste and livestock waste water if discharged directly outside the environment will affect the source of groundwater (sub-project area used underground water for living) or quality soil, killing trees, causing or rotten roots

Processed livestock waste water can be used for farming, however, with a variety of plants.

Odor from livestock waste will affect the health of the population as a headache, vomiting.

Waste and livestock waste water often attracts the concentration of many kinds of infectious insects like flies, mosquitoes, cockroaches, bacteria

Aquaculture effluent from excess food, feces and nutrient metabolism, which is the source of pollutant origin. Waste water carries a large amount of nitrogen, phosphorus and other nutrients, causing the hyper-nutrient and broad-nutrition that leads to the rapid development of bacteria. The presence of carbonic and organic compounds will reduce dissolved oxygen and increase BOD, COD, Hydrrogen sulfite, ammonia and methan content in the natural water sector. Another problem from the shrimp waste water is the deposition of mud in the vicinity, as mangroves and in the places of jail.

Use of aquatic and chemical drugs that cause adverse effects on angioedema organisms and basal organisms due to their influence on their ecological toxins (ecotoxic).

Wastewater aquaculture is a mangrove of agricultural land around the region and groundwater.

When deploying pilot models, the project will guide farmers to environmentally friendly, natural production models. Therefore the use of fertilizers, plant protection chemicals in aquaculture models and cultivation will be very limited and the use will be controlled so the environmental impact will be controllable. Breeding activities will also towards clean and safe production, so livestock waste and the use of the preparations will also be administered, strictly controlled during pilot execution and scaling of models. For wastewater from aquaculture, the project will also support the infrastructure investment and monitoring of water quality to control the quality of wastewater output. Some measures to control when choosing a position and implementing the model will also be presented in the mitigation measure

CHAPTER 4: MEASURES TO MINIMIZE IMPACTS AND RISKS

4.1 Mitigation measures are mainstreamed into FS/detailed design

River Dike, Sea dike:

-The surface design ensures traffic, protects the inner roof in plain environmentally friendly measure (grass, vegetation)

-Connection design between Bridge and pier ensures smooth, safe with reasonable slope and has a warning, protective barrier...

-The design of clearing the ditch/sewers/canals is influenced by the construction works to maintain irrigation services, non-prison water or local flooding in the area.

-A vertical design with several stairs with the width, safety slope for the manager/local people approach the water.

Routes:

-Design route avoiding urban, populated areas

-At the site of the bridge need 2-side slope and steep up and down should protect by cement filling, concrete, planting grass or applying a combination of cement and grass planting.

-Designing the Secure delivery buttons in the phase of operation by signal lights, the lines of the pious, signs of traffic, walking to the pedestrian lines when passing the residential area, there are signs, lines controlling the speed at the passages Through the administrative center, school, hospital, etc.

-Smooth swipe design between new road surface into the motels (schools, hospitals, houses, facilities...) in the high-level segments to ensure safety during operation

-Lighting Design (column, power Ball) pay attention to the energy saving factor (energy saving bulb) and fine art form, beautiful decorations increase the landscape value;

-Has a system of vertical and horizontal drainage and greenery.

Electric Route:

-Make the most of traffic corridors, existing roads and trails as a safe corridor for lines and substations

-Ensure maintaining electrical safety corridors (width and height) in passages with the population

4.2. Mitigation measures for the preconstruction period

As discussed in the previous section, the impacts of Sub-project's pre-construction period are: (1) the land withdrawal; (2) The infrastructure affected by land withdrawal; (3) The risk of a mine.

Measures to minimize impacts on land recovery and infrastructure are affected by land recovery process

The recovery of land and resettlement will be carried out in accordance with the Resettlement Policy Framework (RPF) approved by the project which establishes the principles of resettlement, the requirements of eligibility for compensation , pricing methods, descriptions of legal and institutional frameworks, organizational structure, funding and consultation mechanisms, community involvement and complaints resolution mechanisms are applicable to the Sub-project during project implementation. This Sub-project resettlement Action Plan (RAP) was prepared in accordance with the RPF which was presented and adopted by the WB. The RPF has been prepared in accordance with the WB's involuntary resettlement policy (OP/BP 4.12) and Vietnam rules and regulations.

The fundamental principles of the resettlement policy of Sub-project include:

-All persons affected, regardless of the status or socio-economic status will be compensated and supported for damage on property, income and production of business at alternative prices and the restoration of living , income and production capacity or more without Sub-project.

-Soil price for compensation (compensation, support) is determined with the market price under normal conditions. When there is a difference between the compensation price and the market price, the compensation price must be adjusted accordingly.

-The land will be compensated under the mechanism of "land change Land" or indemnify in cash according to the choice of the affected person whenever possible. Those who take ground production from 20% of the area must be entitled to choose land for soil change. Without land, PPMU must ensure, meet the requirements of the WB, that there is really no land to change land. People who take from 20% of the land of production or more may need additional assistance in order to restore the inheritance. These principles also apply to poor people and those who belong to vulnerable groups that are lost from 10% of the land of production or more.

-Those affected to choose the "Land for Land" option will be granted land plots with the ability to produce the equivalent of lost land plots or standard land-level settlements in the new settlement near the old residence , and there is cash adjustment to compensate for the price difference between the lost land lot and the land lot granted.

-People who are affected choose the "Land for money" option will be compensated in cash at the cost of replacing the entire area of the revoked land. These affected people will be assisted in the restoration of the birth and self-arrange for relocation.

-Compensation for housing works, commercial buildings, or other types of works shall be paid at the cost of replacement without the depreciation of works and without subtraction of the parts of the material that can be recovered.

-Widespread on the policy of compensation and economic development of the Government to the local community. Dissemination of the implementation of Sub-project in accordance with the rights and obligations and the law. Declare the price of

compensation (details for each affected asset) to the affected person. Announce and accurately notify the amount of indemnification of each household.

-Other support such as economic recovery support, training and other forms of support will be provided to those affected by the loss of income sources, especially vulnerable groups to enhance the resilience and Improve later income.

-To calculate the compensation for land and land work:

The total estimated cost of 84,411,793.000 VND (eighty billion four hundred eleven million seven hundred ninety three thousand VND) equivalent to the amount of US $ is 3,707,963.67 USD. In which the cost of compensation of 44,364,928,000 dong equivalent to the amount calculated in US $ is 1,948,821.79 USD The remaining is the costs of support, the cost of making compensation, support and resettlement and rewards the land on time with 40,046,865,000 copper (equivalent to 1,759,141 , 88 USD). (These costs do not include the cost of relocating the power system). The aggregate compensation and support funding of SUB-PROJECT is presented in the following version:

No.	Description	Affected households	Unit	Total	Price (1.000 VND)	Money (1.000 VND)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I	**COMPENSATION**					**44.364.928**
1	**Land compensation**					**33.123.499**
1.1	***Permanently affected***			***497.936***		***32.883.544***
	- Land for annual crops	662	m^2	366.560		18.450.541
	- Land garden	147		37.205		2.250.790
	- Aquatic Land	30		11.453		404.333
	- Land	670		10.718		11.539.880
	- Land for business	1		200		238.000
	- public land			43.800		
	- Land irrigation			28.000		
1.2	***Temporary effects***			***63.146***	***3.8***	***239.954***
2	**Housing**	156		4.915.00		**6.371.205**

No.	Description	Affected households	Unit	Total	Price (1.000 VND)	Money (1.000 VND)
	compensation					
3	**compensation for damage works**					**1.245.140.82**
	- Garden	267	m^2	7115	32.979	234.646
	- fences	25	m^2	540		238.116
	- roof	39	m^2	709	280.194	198.658
	- Camp	12	m^2	390	389.067	151.736
	- Stores	29	m^2	816	389.067	317.479
	- Kitchen	6	m^2	120	383.835	46.060
	- Water tank	6	cái	6	2000	12.000
	- Cages	2	m^2	38	389.067	14.785
	- Wells	8	--	8	3.957.82	31.663
4	**Compensation for damage plants and crops**					**3.625.084**
	- Fruit trees	666	Tree	6.984		1.899.755
	- Timber Trees	161	Tree	1.537		201.453
	- trees annually	577	m^2	119.998		1.443.876
	- Plants	203	Tree	1.033.00		80.000
II	**SUPPORT**					**38.391.732**
1	**Support moving**					**446.310**
	- Relocation in the province		household	133		378.900
	- Moving graves	4	--	9		24.210
	Grave Land			3	1.870	5.610

No.	Description	Affected households	Unit	Total	Price (1.000 VND)	Money (1.000 VND)
	Tomb building			6	3.100	18.600
	- Support for the money to buy land exhumed grave	4	--	9	4.800	43.200
2	**Support stable life**					**851.760**
	- Support activities for 12 months	1		4	4680	18.720
	- Support activities 6 months	75		356	2.340	833.040
3	**Support stable life**					**31.658.497**
	- Support for career change and job creation		1.000 VND	21.105.664	1.5	31.658.497
4	**Program income restoration**					**610.000**
	- Support for agricultural development model	325				610.000
5	**Support lost business income**	29		29	1000	**29.000**
6	**support housing**	47		47		**171.600**
6.1	Support rural housing	46	household	46	600	165.600
6.2	Support the rent town area	1	household	1	1000	6.000
7	**Support (groups vulnerable).**	6		6	12000	**23.000**
8	**Rewarded for ground delivery time**		household			**1.488.656**

No.	Description	Affected households	Unit	Total	Price (1.000 VND)	Money (1.000 VND)
9	**support investment rates in infrastructure for the relocated households Housing**	47	household	8	50.000	**2.350.000**
10	**Allowance repair the affected one part**	85				**762.909**
III	**PLUS**					**82.756.660**
IV	**The COST of IMPLEMENTING COMPENSATION SUPPORT TĐC 2%**					**1.655.133**
V	**TOTAL**					**84.411.793**

Minimize the impact on physical cultural assets

Compensation policy for relocation of 09 tombs of the affected 4 households has been put into the RAP of Sub-project and will include the costs for the purchase of new land for reburial, digging costs, relocation, reburial and other related costs that are Costs to perform spiritual procedures. The affected households or groups will be compensated in cash as have been determined through the affected community consultation process. The compensation level will be decided in the process of consultation with the affected households/communities. The tombs will be excavated and displaced in accordance with cultural customs.

In the course of implementation, the Sub-project owner will notify early to the households with the affected graves so that they can arrange relocation in accordance with their spiritual procedures and indemnify the affected households as have been specified in the RAP and ESMP The Sub-project.

b. Bomb crash prevention

Minesweeping operations and leftover explosives need to be completed prior to the start of the construction operation, the following steps should be followed throughout the process of removing the leftover explosive materials This should be done in accordance with QCVN 01:2012/BQP – National technical regulation on the discovery

of mines and explosives. To prevent landmines, the private owner will: -Coordinate with relevant departments in the design phase;

-Based on the results of the survey, the Project management committee will sign a contract with an agency of the Defense Department with the Authority on the elimination of landmines and the surviving explosives.

-Ensure that prior to the commencement of the project Management Board received confirmation that the area of the project was to be bombarded with mines and explosives.

The construction method of minesweeping and projected explosives is carried out as follows:

-Zone of Discovery, mine handling, explosives;

-Ground cleaning;

-Detection by detector to depths of 0, 3m;

-Marking, digging test and signal processing to a depth of 0, 3m;

-Detection by bomb detector to 5m depth (placing the machine at high sensitivity);

-Excavate soil, test and handle signals to 3m depth;

-Excavate soil, inspect and process credits up to 5m depth.

Note:

-When the under-incision bomb detector has a depth of < 0, 5m must be drained by the new water drain, mine disposal, and explosives to avoid bombs. When the land-based mine detectors have to plug in the danger, the scene forces, and prevent people, animals, vehicles passing through the construction area to avoid happening at the accident.

-Collecting, sorting, managing and destroying landmines and detectors, found in accordance with the safety standards of preservation, transportation and use of explosive materials QCVN 02:2008/BCT National technical regulation on safety in preservation , transport, use and destruction of industrial explosives, explosive work rules set by the set of Civil command, and other applicable regulations.

-The construction of the mines is responsible for notification to the military command in the field about the implementation of the tasks of the necessary issues: the location of the explosion, the construction plan of the unit and the time of the troops in place.

-In addition, the project owner also notes the contractor to regularly remind workers during the construction process if there are foreign objects of metal (suspect that the

explosives) must promptly notify the local authorities to coordinate processing , it is absolutely not dug or automatically saw cutting foreign objects that can be preserved in the construction process.

If a problem occurs, the investor will fix the problem as follows:

-Quickly call an ambulance to timely transfer the victim to the hospital.

-Support the funding of treatment or indemnification for the victim.

4.3. The impacts of the construction phase

The impacts of the construction phase will be minimized by the general impact mitigation measures presented in the form of environmental practices Rules (ECOP – Environmental Codes of Practice) and specific impact mitigation measures. ECOP will be included and all dossier of the construction contractor along with measures to minimize specific impacts by location and type of works category suitable for the package.

4.3.1. General impact mitigation measures

The measures to minimize the general impact apply to all construction items the works are presented below:

The code of Workers ' conduct

1. Comply with relevant regulations of applicable law.
2. To comply with health and safety requirements (including the use of personal occupational safety equipment, accident prevention and responsibility for reporting conditions and actions that pose a risk of safety or threat of the environment).
3. Prohibited to use prohibited substances.
4. Non-discrimination on the basis of family status, ethnicity, gender, religion, language, marital status, birth, age, disability or political opinion.
5. Communicate and communicate properly with members of the local community, showing respect for and without discrimination.
6. Prohibition of sexual harassment, prohibiting the use of languages or behaviors, especially for women and children, with harassing, abusive, intended sexual harassment, inappropriate for human dignity or non-cultural relevance.
7. Prohibits acts of violence or abuse. Prohibit the use of money, employment, goods or services for sexual exchange, including sex brokers or other forms of humiliation, the conduct of the price or abuse.
8. Child protection includes the prohibition of abuse and inacceptable behavior for children, limiting exposure to children and ensuring the safety of children in the construction area.
9. Ensure workers use clean water equipment and sanitary hygiene provided by contractors, prohibiting indiscriminately.
10. Avoid conflicts of interest. Do not provide benefits, contracts, jobs, and bias against anyone who has a financial, family or personal relationship.
11. Respect for business requirements including environmental and social norms.

12. Protection and proper use of assets. Prohibition of theft, uncontrolled use of resources and discharge from polluting environment.
13. No retaliation against any worker who reports the violation.
14. Responsible for reporting violations of this rules.
15. The contractor is responsible for ensuring that all workers (i) receive copies of this rules, (ii) clearly and adequately explained the requirements in the rules, (iii) committing to the implementation of these rules as a condition in the labor contract , and (iv) understand that the violation of the provisions specified in the rules may result in serious consequences including the cutting of contracts and prosecution before the law.

Must do	**Prohibited**
◆ Use the toilet facilities provided – report dirty or full facilities ◆ Clear your work areas of litter and building rubbish at the end of each day – use the waste bins provided and ensure that litter will not blow away. ◆ Report all fuel or oil spills immediately & stop the spill from continuing. ◆ Smoke in designated areas only and dispose of cigarettes and matches carefully. (littering is an offence.) ◆ Confine work and storage of equipment to within the immediate work area. ◆ Use all safety equipment and comply with all safety procedures. ◆ Prevent contamination or pollution of streams and water channels. ◆ Ensure a working fire extinguisher is immediately at hand if any "hot work" is undertaken e.g. Welding, grinding, gas cutting etc. ◆ Report any injury of workers or animals. ◆ Drive on designated routes only. ◆ Prevent excessive dust and noise	◆ Cutting of trees for any reason outside the approved construction area, remove or damage vegetation without direct instruction. ◆ Hunting, fishing, wildlife capture, or plant collection; ◆ Poach, injure, trap, feed or harm any animals – this includes birds, frogs, snakes, etc. ◆ Buy any wild animals for food; ◆ Have caged wild animals (especially birds) in camps ◆ Poaching of any description; ◆ Collection of firewood; ◆ Make any fires, burning of wastes and/or cleared vegetation. ◆ Spillage of potential pollutants, such as petroleum products; ◆ Latrine outside the designated facilities; ◆ Enter any fenced off or marked area. ◆ Driving in an unsafe manner in local roads; ◆ Littering the site or leave food lying around, dispose indiscriminately rubbish or construction wastes or rubble ◆ Use unapproved toxic materials, including lead-based paints, asbestos, etc.; ◆ Disturb anything with architectural or historical value ◆ Use of firearms (except authorized security guards) ◆ Gambling ◆ Use of alcohol by workers during work hours ◆ Do any maintenance (change of oils and filters) of

Must do	Prohibited
	cars and equipment outside authorized areas ◆ Work without safety equipment (including boots and helmets) ◆ Create nuisances and disturbances in or near communities ◆ The use of rivers and streams for washing clothes, cars, equipment;

Demolition of Existing Infrastructures

The following measures shall be implemented in order to protect workers and the public from falling debris and flying objects:

- Set aside a designated and restricted waste drop or discharge zones, and/or a chute for safe movement of wastes from upper to lower levels;
- Conduct sawing, cutting, grinding, sanding, chipping or chiseling with proper guards and anchoring as applicable;
- Maintain clear traffic ways to avoid driving of heavy equipment over loose scrap;
- Provide all workers with safety glasses with side shields, face shields, hard hats, and safety shoes.
- All of the workforce shall abide by the laws and regulations of the Socialist Republic of Vietnam;
- Illegal substances, weapons and firearms shall be prohibited;
- Pornographic material and gambling shall be prohibited;
- Fighting (physical or verbal) shall be prohibited;
- Creating nuisances and disturbances in or near communities shall be prohibited;
- Disrespecting local customs and traditions shall be prohibited;
- Smoking shall only be allowed in designated areas;
- Maintenance of appropriate standards of dress and personal hygiene;
- Maintenance of appropriate standards hygiene in their accommodation quarters;
- Residing camp workforce visiting the local communities shall behave in a manner consistent with the Code of Conduct;

Security: Some security measures shall be put into place to ensure the safe and secure running of the camp and its residents. Some of these security measures include:

- The list of workers must be registered to local authorities in accordance with existing Vietnamese regulations
- Children under 14 years of age will hot hired under the Project
- Adequate, day-time night-time lighting shall be provided;
- Control of camp access. Access to the camp shall be limited to the residing workforce, construction camp employees, and those visiting personnel on business purposes;
- Prior approval from the construction camp manager for visitor's access to the construction camp;

- A perimeter security fence at least 2m in height constructed from appropriate materials;
- Provision and installation in all buildings of firefighting equipment and portable fires extinguishers.

Workers Camps

Workers' Camp and Site Installation Requirement. Potential sites of workers'camps were discussed with and proposed by local communities and authorities during consultations.Construction camp sites will have to be approved by local authoritiesand agreed with local communities prior to their establishment. If additional camps and ancillary construction sites are selected, for following criteria must be used:

- Construction sites, including concrete mixing stations and asphalt stations as well as construction camps will minimize the land occupation by setting them at the interchange areas where relatively large areas of land will be needed eventually.
- Site offices shall be located at least 200 meters from any existing residential settlements Camp facilities should not be located in steep slopes;
- Site offices, camps be located at least 100 meters from any watercourses, and be operated so that no pollutants enter watercourses. Camp areas shall be located to allow effective natural drainage;
- All construction camps shall be zoned according to their use. For example, workers' camp zone, sanitary facilities, offices, etc.
- The workforce shall be provided with safe, suitable and comfortable accommodations. They have to be maintained in clean and sanitary conditions;
- In every site adequate and suitable facilities for washing clothes and utensils shall be provided and maintained for the use of contract labor employed therein;
- Potable water for human consumption shall be provided for at camps, site offices, medical facilities, and other areas. Potable water shall follow the National Standards for Drinking Water Quality, and the other municipal water will be in accordance with class A1 of QCVN 08-2008/BTNMT - National technical regulation on surface water quality.
- The camp can be characterized as a housing estate, and the water quota could refer to class A1 QCVN 08-2008/BTNMT - National technical regulation on surface water quality.
- Drainage, wastewater treatment and solid waste disposal of the construction site shall follow national regulations and the mitigation measures presented in the Contractor's Waste Management Plan.

Sanitary Facilities. In every camp site separate and adequate lavatory facilities (toilets and washing areas) shall be provided for the use of male and female workers. Toilet facilities should also be provided with adequate supplies running water, soap, and toilet paper. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic conditions;

- Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers "For Men Only" or "For Women Only" as the case may be;
- Sanitary arrangements, latrines and urinals shall be provided in every work place on the following scale: Where female workers are employed, there shall be at least

one latrine for every 25 females or part thereof; Where males are employed, there shall be at least one latrine for every 25 males or part thereof;
- At every construction camp, there must be at least one septic tank. The wastewater from the tank shall not be discharged into any watercourses. The wastewater shall be periodically transported away by a water tank to the nearest treatment plant;
- Sewage tanks shall be designed and installed by the Contractor(s) in accordance with the National Design Code for construction of camps.

Medical Facilities. A medical and first aid kit shall be provided at each camp area. All consumables in the first aid kit should be checked and recharged regularly.

Concrete mixing stations

- Construction sites, including concrete mixing stations and asphalt stations will minimize the land occupation by setting them at the interchange areas where relatively large areas of land will be needed eventually.
- Concrete mixing must be done on impermeable ground, waste and waste water containing cement must be collected through drains with slurry sump on-site before being discharged into the receiving source.
- The concrete mixing station must be at least 200 meters away from residential houses or other sensitive buildings such as buddhist pagodas, churches, temples, school gates, medical facilities and public agencies.

Table 5. 1. Environmental Codes of Practice (ECOP)

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
1. Dust arise	1.1. The contractor is responsible for complying with the regulations of Vietnam in terms of ambient air quality. 1.2. The contractor must ensure that the amount of dust that is arising is at a minimum, and does not make people feel uncomfortable. The Contractor shall implement dust mitigation measures to maintain a safe working environment, minimize the disturbance of the surrounding residential areas. 1.3. The contractor shall take measures to minimize dust (e.g. use a tank car to irrigate the road, cover the carriage of vehicles and the piles of loose materials when applicable...). 1.4. Material must be reasonably shielded and safe throughout the transport to prevent soil, sand, materials or dust from spreading along the way. 1.5. The piles of digging and materials to the outdoors must be protected from wind flying, when choosing the link to take into action the prevailing wind direction and position of sensitive objects. 1.6. Equipment for the use of pages for workers 1.7. Following the projection method, there is no compact way. 1.8. Watering the construction area near the home and works sensitively on hot sunny days; 3.3. The canvas covers the transportation of land, sand, cement.... To limit the spread of dust.	• QCVN 13:2009/BTNMT: National technical regulations for ambient air quality
2. Air pollution	2.1. All means of transport are subject to Vietnamese regulations on emissions control. 2.2. All means of transport posted periodically at the decision No.	TCVN 6438-2005: Road transport. The biggest limitation of emissions allowed.

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
	35/2005/QD-BGTVT; 2.3. Do not burn waste or materials on the field (e.g., asphalt...). 2.4. Concrete mixing stations must be located away from the residential area	• Decision No. 35/2005/QD-BGTVT Regulations on quality inspection, technical safety and protection at each school motor vehicle imported into Vietnam. • QCVN 05:2013/BTNMT: : Regulations on air quality around. • Decision No.249/2005/QĐ-TTg on 10/10/2005 of the Prime route of emission regulations for road transport
3. Impact by noise and vibration	3.1. The Contractor shall be responsible for complying with the provisions of Vietnamese law noise and vibration. 3.2. The contractor will use only vehicles with a limited use certificate. 3.3. Periodic maintenance of construction machinery. When noise is too large or unusual, the contractor will take necessary measures such as mounting down the bar or replacing some of the necessary parts to reduce the noise of acceptable levels. 3.4. Restrict simultaneous operation of too many means of developing loud noise in an area where the subject is sensitive to noise and vibration. 3.5. Avoid construction at night and the avoidance of the activities that produce loud noises in the range from 22h: 00 to 06:00. 3.6. Shutdown when media stops exceed 30s; 3.7. Avoiding or restricting the carriage or placement of material	• QCVN 26:2010/BTNMT: National technical regulations on noise. • QCVN 27:2010/BTNMT: Technical regulations on vibration.

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
	preparation (concrete mixing) passing through or near the residential areas and avoiding the area of the set preparation areas 3.8. Avoid construction at night. If construction is required at night, the notice is at least 3 days in advance 3.9. Restricting the simultaneous operation of devices that cause vibration	
4. Water pollution	4.1. The contractor is responsible for complying with Vietnam's legal regulations for flushing water 4.2. Before the commencement of the construction, the contractor must request a discharge permit if required. Before completion, construction works, tanks and septic tanks will be filled or sealed safely.	• QCVN 09:2008/BTNMT: National technical regulations on groundwater quality; • QCVN 14:2008/BTNMT: National technical regulations on domestic wastewater quality; • QCVN40:2011/BTNMT: National technical regulation on waste water; • TCVN 7222:2002: Environmental general requirements for concentrated domestic wastewater treatment stations.
5. Drainage, sedimentation and erosion	5.1. During the rainy season there will be stagnant water in the nail holes in the construction process. So 5.2. Avoiding, limiting the exercise of digging, disturbance of ground in the rainy season 5.3. Construct drainage pits and mud pit to ensure the field is not flooded, muddy, and sand mud is relieved before the surface flow goes out of the field. Pumps for water from the foundation pit must be directed to the	• TCVN 4447:1987: Land Work-construction and collection process • Circular No. 22/2010/TT-Bxdon 03/12/2010 of the Ministry of Construction regulations on occupational safety in the

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
	nearest ditch, which does not cause the local construction area 5.4. Periodic maintenance of the drainage system to avoid blockage due to backfill by mud or other materials; 5.5. To retain areas that are not disturbed by building activities; 5.6. Maintenance of the training areas, sloping roof according to construction specifications, including measures such as water drainage grooves or vegetation cover. 5.7. In order to avoid the rainwater flowing with many sand mud to pollute the water sources, the contractor will do the mud pit in the positions necessary to slow or redirect the flow to the sedimentation mud before the flow enters into areas with vegetation; 5.8. The land can be stored temporarily along the construction line, the positions agreed in advance with the authorities and the local people. At the same time, the contractor will avoid planning the construction, digging up the soil in the rainy season to avoid water pollution. If construction is required during the rainy season, the Contractor shall apply the appropriate construction measures such as the cover, covering the land, and digging the drainage and pumping the water from the construction area to avoid causing local flooding.	construction of works • QCVN 08:2008/BTNMT-National technical regulation on surface water quality
6. Management of raw materials, land, quarry, quarry	6.1. For mines and beaches or large earths, contractors will have to apply specific mitigation measures beyond the scope of ECOP; 6.2. Any contractor's position to use must be explicitly defined in the approved construction plan. The contractor must avoid sensitive areas such as scenic landscapes, natural residence areas, areas near sensitive subjects and water sources; 6.3. The contractor shall do the openings around the temporary landlands	

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
	for collecting water; 6.4. When the contractor is required to make a barrier to the waste area; 6.5. If a new area is required for the construction process, the Contractor shall apply for approval of the construction supervision consultant	
7.Arising waste	7.1. Before the commencement of the construction, the contractor establishes a solid waste control (temporary storage, supply of containers, construction schedules, disposal...) and conducts strict internal monitoring during the construction process; 7.2. The contractor for the discharge permit before the weld is discharged; 7.3. Contractor placing trash in all construction locations; Issued prohibiting indiscriminately litter behavior. 7.4. Reusing ground-layer peaches when cleaning the ground for useful purposes such as leveling the background or planting crops if the quality of the soil reaches the applicable standard; 7.5. Solid waste is only stored in locations supervised by supervision consultants and local authorities, otherwise, to be transported immediately to the dump. 7.6. Trash should be sealed, withstand sunny rains, prevent mouse bugs, insects; 7.7. Do not burn, bury or litter indiscriminately on the field; 7.8. Recyclable materials such as wood formwork, steel, scaffolding, anti-corrosion, packaging, etc. will be collected and classified in place for reuse, santing or selling to the crumbling; 7.9. Burning waste in place on the field If there are solids and construction waste that are not transported away from the public, the contractor shall be poured only in pre-determined	• Decree No. 59/2007/ND-CP on solid waste management; • Decree No. 38/2015/ND-CP dated 24/04/2015 of the government on waste management and scrap

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
	positions and approved by the supervision consultant. In any case, the contractor should not pour any materials in environmental-sensitive areas such as natural habitats or canals, rivers and streams.	
8. Chemicals and hazardous waste	8.1. Disposal of nuclear materials or other toxic substances made only by those who have been trained and workers with appropriate certificates; 8.2. Used grease, wipes and lubricant materials when maintenance of vehicles, machinery will be collected into the containers for transportation from the site by the company specializing in the hazardous waste treatment; 8.3. Promptly notify the supervisory consultant and the investor so that they notify the authorities when accidents or chemical incidents occur. 8.4. Storing chemicals appropriately, labeled with complete information necessary; 8.5. Notice, training of the workers to recognize and respond to the chemical incident in; Building and implementing action programmes to overcome material spills or incidents. If this occurs, the contractor must report the explanation to the cause of the chemical spill or accident, corrective action taken, consequences/damages from the incident, and propose remedies.	• Decision No. 23/2006/QD-BTNMT: On the issue of hazardous waste portfolios • Circular No. 12/2011/TT-BTNMT on 14/4/2011 of Ministry of TN & MT Regulations on hazardous waste management
9. Dredging Sludge Management	9.1. Need to build the dredging plan with information on time schedule and construction measures to meet the requirements of transportation safety, public health and environmental sanitation. To ensure the dredging compliance with environmental regulations, it is necessary to engage the authorities (PPC, Ward, Department of Resources and Environment, utility services company, supervision consultant, investor etc...) in the process of construction and implementation The current plan;	• Decision No. 23/2006/QĐ-BTNMT: On the list of hazardous waste • Decree No. 59/2007/NĐ-CP ngày 09/04/2007 about solid waste management.

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
	9.2. The characteristic of sediment/mud will be determined by sampling and analysis if not sufficiently rated during the environmental impact assessment. When the mud is heavily contaminated, it is required to minimize the scope of ECOPs; 9.3. Ensuring that the digging and dredging management plan has considered environmental and social issues when identifying short-term temporary storage positions and long-term waste, reviewing methods for reducing dredging , and maximize the use of dredging materials for useful purposes; 9.4. Test the pH of the dredge material and do not put the material, leaking from the material into the water source prior to filtering or handling satisfactory requirements; 9.5. Dredging materials must be handled in accordance with Vietnam's regulations on waste collection, safety and sanitation when transporting, storing, storing, processing and management; 9.6. The parties involved in sludge processing must be skilled and compliant with circular No. 36/2015/TT-BTNMT on hazardous substance management in case of necessity 9.7. Landfills must meet technical requirements depending on the level of pollution. In the field of disposal in a toilet burial, hazardous waste may need to be poured in the umbrella for hazardous waste.	• Decree No. 38/2015/NĐ-CP ngày 24/04/2015 of the Government on the management of waste and scrap •
10. . Disturbance of vegetation and	10.1. The contractor shall propose measures to minimize to the lowest impact and risk for vegetation and biological resources and strictly perform after approval supervision consultation; 10.2. No use of chemicals for plant luminescent; 10.3. Prohibiting the cutting of any trees that are not located in the	• Environmental protection Law No. 55/2014/QH13

Social environment issues	**MITIGATION MEASURES**	**VIETNAMESE REGULATION**
creature resources	clearance area for construction service. 10.4. When necessary, install an anti-temporary fence to protect the greenery before the construction begins; 10.5.The contractor commits that it is not to happen to hunt, trap, and poison animals.	
11.Traffic control	11.1. The contractors set up and plan for traffic management and process TVGS to review and approve before the commencement 11.2. Consult local governments, communities and work with traffic police before the commencement of the construction; 11.3. Installation of lights at night at the necessary locations to ensure night traffic safety; 11.4. Placing the instruction panels around the school to minimize circulation disturbance, and ensure safety; 11.5. Adopting traffic, road and waterway control measures on the river/channel and the Flagerman to guide traffic at hazardous positions; 11.6. Avoiding the transport of building materials during peak hours; 11.7. There are private pedestrian walkways and vehicles inside and outside the construction area for safety. Installation of the sea is necessary to control waterway and road traffic. 11.8. Advocacy and training to improve the sense of behavior for traffic safety regulations for the driving team; 11.9. Arrange the traffic control personnel in the construction area to ensure traffic safety;	• Road Traffic Law No. 23/2008/QH12 • Law on Construction No. 50/2014/QH13 • Circular No. 22/2010/TT-BXD dated 03/12/2010 of the Ministry of Construction regulations on occupational safety in the construction of works.
12.Risks of damaging	12.1. Contractors cooperate with the investor to work with the authorities if cutting water, electricity, Internet... To serve the construction, 12.2. Working with vendors to restrict public service suspension time for	• Decree No. 73/2010/ND-CP the provisions sanctioning administrative

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
existing infrastructure works or disrupting utility services	existing migration works 12.3. The contractor only uses appropriate size and load vehicles to avoid damaging the existing road. The Contractor shall repair and restore all damage to the roads and bridge caused by the construction operation 12.4. Prior notice to affected households at least 5 days prior to temporary cutting of electricity, water or other services (at least 5 days prior to the time); 12.5. Avoid cutting water for agricultural areas; 12.6. The contractor must ensure the alternative water supply for the affected residents if the water is cut on a day; 12.7. If the construction is damaged by the existing construction, the contractor must notify TVGS and the investor to be reported to the authorities. The contractor will be liable to repair, overcome any damage of roads and bridge caused by construction operation or use of the vehicle overloaded.	violations in the field of security and order, social safety
13. Restoration of affected areas	13.1. The contractor shall clean up waste, excess materials, deception, Lucifer and reimburse areas that are disturbed by the construction activities such as digging pits that are no longer in use, waste dump, auxiliary works,, camps of workers , warehousing and every position are temporarily occupied during construction by restoring landscaping, drainage and vegetation; 13.2. The return of vegetation will be made as soon as possible. The proper indigenous plants will be chosen for planting and restoring landscapes; 13.3. San repair of ground and roof piles, grass planting to avoid erosion; 13.4. Make amendments and refunds to all affected areas without delay,	• Environmental protection Law No. 55/2014/QH13

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
	including green spaces, roads, bridges and other existing works; 13.5. Planting trees in locations according to construction drawings; 13.6. Digging out contaminated land by chemicals or toxic substances, transported to suitable landfills; 13.7.Restore sugar, the bridge is damaged by the operation of the project.	
14.Social impact, security	14.1. Contractor to register temporary residence for workers with local authorities 14.2. Disseminating and asking workers to comply with the project Code of Conduct 14.3. The layout of regular protection and ensure the illumination of night at the construction field. 14.4. Temporary storage area, storage space at least 50m from the residential area. 14.5.Rules of worker's conduct (at the end of this table)	
15. Safety and health risks for communities and workers	15.1. Contractors must adhere to the Vietnamese Law on Occupational safety; 15.2. Integrating HIV/AIDS awareness during training sessions with contractors ' VSMT trainings. Arranging workers to attend awareness training sessions for workers on HIV/AIDs 15.3. Works must have roadblocks, sea newspapers, and ensure lighting at night. 15.4. Implementing a segment-by-piece implementation to minimize the	• Circular No. 22/2010/TT-Bxdon 03/12/2010 of the Ministry of Construction regulations on occupational safety in the construction of works • Directive 02/2008/CT-BXD reinforcing enhancement measures to ensure occupational safety and hygiene units of construction industry • TCVN 5308-91: Technical safety regulations in construction

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
	impact on the community 15.5. Equipped with an ambulance bag and the necessary first aid vehicles on the site; 15.6. Training of workers in occupational safety and hygiene and occupational health; Arranging workers to attend HIV/AIDs awareness training classes organized by the project 15.7. Providing earpiece buttons for workers to use when working near the noise machines that produce loud noise beyond the standard; 15.8. Protecting, securing the safety of workers and the community in the process of dismantling existing works by blocking, excitement of the debris, nets not to fall below,, control traffic, prohibit into hazardous areas; 15.9. Installation of fences, roadblocks, warnings, dangerous/prohibited warnings in areas of the public sector are at a safe risk for the community; 15.10. The contractor applies all measures to ensure safety such as installation of fences, warning barriers, lighting systems in order to avoid traffic accidents and other risks for sensitive residents and areas; 15.11. The contractor does not discriminate in terms of wages between	• Decision No. 96/2006/QD-TTg on 04/05/2006 of the Prime Minister on the management and implementation of the bombing, mines, and explosives.

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
	men and women, between Kinh and people of local ethnic groups if they work together in a peer position; Non-use of child labour and compliance with government labor laws and relevant international treaties; 15.12. Creating the maximum employment for women and poor households is local in the process of construction. 15.13. Safety rules when working on high: -Check the solidity and stability of the texture before conducting the job; -Training for workers and applying measures to ensure safety when working on high-climb technique, use safety belts, set the mesh to be excited. -When workers work on high with equipment and instruments, they must establish additional shields to ensure the safety -Must remove all the alarms and other obstructions on the column before starting the work -Must use carrying bag to transport instrument up-down for workers in the process of working at high	
16.For the local	16.1. Inserting the information board with the following information: (i) the scope of work of the package; (ii) The date of commencement,	• Decree 73/2010/ND-CP provisions sanctioned

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
community and government	completion date, contractor name, construction commander, and telephone number; (iii) The investor name, supervision consultant and contact number. 16.2. Maintains close contact with local governments and local communities in order to grasp the security of the situation, update workers as necessary and coordinate with local authorities to plan their construction plans at positions or times Sensitive (e.g., religious day holidays). 16.3. Providing ECOPs in Vietnamese and safety documents for workers and communities. 16.4. To notify governments and residents when construction is a narrow space for the activities of the community, they may make suggestions about remedies. 16.5. Disseminating project information for affected groups, local governments, businesses, and households affected... Prior to the commencement of construction; 16.6. Notify the population of the working progress and the construction of temporary disruption of services, avoidance routes, and dismantling as it sees fit. 16.7. Notify the community as soon as possible and repeat at least 03 days prior to disruption of any services (including water, electricity, telephone). The community must be notified through the listing on the project site, and in the affected home/business venues. 16.8. All community infrastructures such as roads, bridge, water supply system, mini generators, dock seats, irrigation systems, etc. Affected by the construction process must be restored to satisfy the requirements of the	administrative violations in the field of security and order, social security

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
	community and be approved by the supervisory engineer. 16.9. All local roads used by the contractor or as the road to avoid will have to be recovered back to its original state. 16.10. Establishing and maintaining the receiving board to process and seek to address safety and environmental complaints related to the construction operation. The board shall be monitored by the environmental officer of the contractor. Records of complaints, grievances and ways of resolving complaints, which must be retained and are always available to supervisory engineer and PMU consider. 16.11. Creating and maintaining a communication channel with the community so that interested parties can receive information on the activities of the website, project status and the results of project implementation; 16.12. Providing information, especially technical information that is understandable to the general public and useful form that attracts the interest of the community, local governments such as flyers, newsletters when important information..; 16.13. To monitor the concerns and needs of community information; 16.14. Responding to queries by telephone and in writing in a timely and accurate manner; 16.15. Notify the households on the construction schedule, the time of suspension of some public services, traffic flow... When necessary; 16.16. Providing technical information and drawings to the community, construction area scheme and the contractor's social environment management plan;	

Social environment issues	MITIGATION MEASURES	VIETNAMESE REGULATION
17. Implementation process when artifacts are revealed	17.1. If the contractor detects the archaeological site, historical relics, remains and artifacts, including the graves or graves in the process of digging, construction, the Contractor shall: 17.2. The construction activities in the area are revealed; 17.3. Zoned, define the location boundaries or the disclosure area; 17.4. Protecting the field, prevents damage or loss of artifacts that can be moved. If it is an organism that can move or have sensitive remains, the night guard may be held until the agency functions such as Department of Culture, Sport and tourism to the next; 17.5. Notify the supervisory consultant so that TVGS notify the authorities within 24 hours or sooner); 17.6. The authorities will make subsequent procedural decisions. They can do report preliminary assessment of revealed artifacts based on various criteria on cultural heritage such as aesthetic value, history, science, research, society and Economics...; 17.7. The decision on how to treat the revealed area will be made by the authorities. This may include readjusting the position of construction, preservation, protection, restoration or excavation for withdrawal. 17.8. If an existing material or relic is highly valued, it may be recommended that conservation of the relics be proposed by experts. Then the project owner will have to adjust the design to meet the requirements and preserve this place; 17.9. Decisions relating to the management of relics shall be notified in writing by the competent authorities; 17.10. The contractor is allowed to continue construction only after the function authority allows...	• Cultural Heritage Law No. 32/2009/QH12 • Decree No. 98/2010/ND-CP dated 21/09/2010 of the government detailing the implementation of a number of laws on cultural heritage and Law on amendments to the addition of a number of laws on cultural heritage.

Social environment issues	**MITIGATION MEASURES**	**VIETNAMESE REGULATION**
18.Gender issues	18.1 in coordination with the local government campaimating women and vulnerable people to acquitted meetings on the project	

4.3.2. Special impact mitigation measures

a. Measures to minimize the specific impact on the sea dike

- The specific impacts and risks of building a sea embankment route have been identified in section 3.5 of (i) impact on biological resources; (ii) increased turbidity, deterioration of water quality affecting aquaculture; (iii) Disruption of waterway and road traffic disturbance and (iv) risk of slump and land slip; (v) Risks for workers ' safety and health when working on high; (vi) The risk of community safety in the area of construction of the drain.
- The following measures will be executed by the contractor when executing the sea embankment route to minimize the impacts and risks mentioned above.

(i) Reduce the impact of dredging operations. Detailed design consultancy will construct the outline of the dredging material management plan as instructed in Appendix 2 topics to take measures and forecasts to mitigate the environmental and social impacts during the dredge process , temporary storage and transportation of materials to the area of construction of the dike glands. Prior to commencement of the contractor, the plan will be detailed and the investor approves.

(ii) Implementing ECOP

(iii) Implementing the specific impacts mitigation measures listed below and in the table 4.2.

-Notice the time of construction and detailed construction plans before the start time of 01 months for the people to actively arrange the cultivation schedules and appropriate solutions;

-Layout of camp in a residential area or vacant land. The camp must have electricity, clean water, vacation areas, sanitary cookers, ensure drainage and solid waste must be collected for hygiene. The toilet must have septic, no direct exhaust to the environment;

-A closed camp for fighting insects entering the camp. Planting lemongrass and applying other natural remedies to prevent insects into the farm

-Organizing propaganda and training to improve the sense of occupational safety for workers before the start of construction and maintenance during the construction period.

-In coordination with the management of mangroves, Cu Lao Dung, the Forest ranger in Soc Trang Province organized the propaganda and training to improve the awareness of biodiversity conservation for workers before the start of construction and need to remain in the The construction period.

-Strictly monitor compliance with the Code of Workers ' conduct including regulations on prohibition of storing, selling, using, hunting wildlife and wildlife products.

-The entire waste including plastic waste must be collected and poured into the specified place, organic solid waste is collected concentrate then buried, not disposed

of in place or discharged the environment in the area. Limiting noise to the lowest level, must shutdown in the earliest time after the construction machine stopped working.

-Notice the time of construction and detailed construction plans before the start time of 01 months for the people to actively arrange the cultivation schedules and appropriate solutions;

-Arrange for dredging time, dykes in dry season, low tide (Month 12 to 4)

-Block the dam with two heads when the drain is executed, water pump to the river/channel when standing water to minimize the risk of flooding in the construction of the bladder.

-Construction in the form of a projection, do not conduct construction on 1 paragraph is too long.

-Set the alert and barricades at the beginning, the end of the line is being executed on the dike, at the intersection of the nodes with the rural transport route so that the means of traffic know and redirect the circulation does not move into the dike;

-The worker of the contractor must assist the people when saving through the construction section of the dike to ensure their safety.

-Attach signal lights on the construction vehicles when stopping on the park at night and nominate the watchman at night.

-When construction is right during the dry season, low tide (Month 12 to 4). The design of the soil and the roofs is designed to ensure safety;

-Use a canvas covering the unfinished sloping roofs at night and the warning of the sea, and the rope around the sloping roofs with slip-and-land risks;

-Observe a regular risk of new roof slippage;

-Avoid focusing people and vehicles on the top and at the feet of the unstable sloping roofs;

-Set the alert and barricades at the beginning, the end of the line is construction on the dike, at the intertopic nodes with the rural transport route so that the means of traffic know and redirect the circulation do not move into the construction area;

Table 4. 2. Measures to minimize the specific impact on the sea dike

Location	Features	Specific impact	Specific mitigation measures
Km 0 	At the beginning, upgrading Mu U bridge. On the right, the 20m foot is 1 resident. The steep, surrounding bridge is farmland and aquaculture ponds. The two sides of the glands have many shrubs and green landscapes. The project to swipe the sea dike with Mu U bridge, change in piles and newspapers, paint the balustrade, drop the sandbag to make the stone carpet combined with the stone reinforced the bridge. No impact on the foundation, the bridge.	Obstruct, road traffic disturbance.	-Set signs, the area is in construction so that people know and not move into the dike. -Construction in the form of a slide, each segment not too long -Do not leave materials and waste to use face and bridge. As a temporary aisle, indications and warnings are safe when traffic on existing roads is disrupted
		Reduction of green space when plants, vegetation are luminescent or damaged due to loading and unloading of construction materials, waste	-Restricted area disturbance in the smallest range -Manual luminescent - Supervise workers ' compliance with the Code of conduct
		Land for digging, spilling material down pond, arable land	Do not dispose of waste, spilled material into arable land, pond
		Safety risk when moving the large slope bridge stage	The priority is carried out before the first-line coupling operation with the dike to reduce slope so that the person and the vehicles can be safer to flow through the bridge
		The risk of slippage when new paths are	- Sloped, compacted compress material on steep roof - The sea is prohibited, barrier does not leave people and means back on the slope when not stable

Location	Features	Specific impact	Specific mitigation measures
		Insect risk attack workers	- Provide enough labor protection for workers such as workwear, gloves, hats, and boots... - Warning and guidance workers in the way of treatment, first aid when insect attack
Km 0 - Km 5+900 	The two shores are farmland, aquaculture ponds. It also has sunken areas with trees and canals.	Road Traffic Disturbance	-Avoid construction during peak season time -Set signs, the area is in construction so that people know and not move into the dike. Construction in the form of a slide, each paragraph is not too long.
		The land of the embankment can be spilling down to farming pond/arable land or Digger.	Not waste, water-filling, arable land, aquatic ponds or ditches
		Insect risk attack workers	- Provide enough labor protection for workers such as workwear, gloves, hats, and boots... - Warning and guidance workers in the way of treatment, first aid when insect attack
		Partial loss of green vegetation	Manual luminescent, no luminescent outside the construction range
K5+900 - Km22 +454 	The bank must be a land for agricultural production (with sugarcane and breeding ponds). The left Bank is CU Lao Dung mangrove forest. Many shrubs	Material that can be spilling down into sugarcane or pond	-No pile of materials too high -Be sure not to waste, spilling material into arable land, pond
		Road traffic disturbance.	-Avoid construction during peak season time -Set signs, the area is in construction so that people know and not move into the dike. -Construction in the form of a slide, each paragraph is not too long. -Do not leave materials and waste to occupy the road surface

Location	Features	Specific impact	Specific mitigation measures
			As a temporary aisle, indications and warnings are safe when traffic on existing roads is disrupted
		Green plants, some wild individuals may be harmful	-Restricted area disturbance in the smallest range -Supervise workers ' compliance with the Code of conduct
		Reduce green space	- Manual luminescent, no luminescent outside the construction range
		Insect risk attacks workers	-Provide enough labor protection for workers such as workwear, gloves, hats, and boots... -Warnings and instructions for workers on the way of treatment, first aid when insects attack
Bridge No. 1 (Km 0+400) 	There are 2 inhabitants of the bridge, 10 metres from the 50m path towards the town. The project of connecting Sea dike with Bridge No. 1, replacing the pepper and sea warning, fixing railing, the flat surface of concrete bridge, reinforced the natural roof with 2 rows of bark crucibles (8 ÷ 10) cm, L = 4, 5m , 8-tree/M layout.	Disturbance, disruption of traffic and road	-Set signs, the area is under construction so that people know and restrict moving into the dike. -Construction in the form of a projection, do not execute the construction on 1 paragraph is too long. -Do not leave materials and waste to occupy the road surface
		Safety risk when working on high, under water.	-Providing labor protection for workers (safety belts, life jackets, lifesaver,...) and monitoring the use of -The followers to respond promptly if someone is drowning or other accidents are water.
		Safety risks of 2 top-of-the-bridge households	Gather material and clean waste to avoid falling into the house and do not hinder the aisle
Bridge No. 2 (Km 1+900)	The paths are pretty much dusty, without a	Insects can inflict injuries to workers.	Warnings and instructions for workers on the way of treatment, first aid when insects attack

Location	Features	Specific impact	Specific mitigation measures
	home. Steep, on-surface paths with gravel, The project will swipe the route with the number 2 bridge, replacing the target pile and the bridge, the repair of the balustrade, the drop of the sand bag to make the stone carpet combination of the bridge.	Safety risk when moving the large slope bridge stage	Priority is carried out before the first-line coupling operation with the dike to reduce slope so that the person and the vehicles can be safer to flow through the bridge
		Disturbance, road traffic disruption	-Set signs, the area is under construction so that people know and restrict movement into the dike -Construction in the form of a projection, do not execute the construction on 1 paragraph is too long. -Do not leave materials and waste to occupy the road surface
		Reduction of green space on the bridge	-Restricted area disturbance in the smallest range -Manual luminescent, no luminescent outside the construction, the worker is not firmly removed from the plant
Bridge No.3 (Km 3+500) 	The paths are pretty much green, and there are no houses near the bridge, and there are a small number of children playing on the bridge. The project will swipe the route with the number 3, change the target pile and the sea, paint the balustrade, flattening the bridge with concrete stones, reinforced feet natural roof with 2 lines of the original , L = 4, 5m,	Reduction of green space on the bridge	-Restricted area disturbance in the smallest range -Manual luminescent, no luminescent outside the construction, the worker is not firmly removed from the plant
		Safety risk when working on high, under water.	-Providing labor protection for workers (safety belts, life jackets, lifesaver,...) and monitoring the use of -The followers to respond promptly if someone is drowning or other accidents are water.
		Insects can inflict injuries to workers.	Warnings and instructions for workers on the way of treatment, first aid when insects attack
		+ Child safety risks if present near the construction area	-Notify the community before construction -Set alarms, warnings -Electorate, coordinate with family, local governments prevent children near the construction area

Location	Features	Specific impact	Specific mitigation measures
	layout 8 plants/M.		
Bridge No. (Km 3+900) 	The paths are pretty much green, and there are no homestays near the bridge. The project will swipe the route to the number 4, change the target pile and the sea, paint the railing, flattening of the bridge with concrete stones, at the location of the bridge reinforced natural feet with 2 lines of the original crucibles (8 ÷ 10) cm , L = 4, 5m, layout 8 plants/M.	+Disturbance, disruption of waterway traffic and road.	-Set signs, the area is under construction so that people know and restrict moving into the dike. -Construction in the form of a projection, do not conduct construction on 1 paragraph is too long.
		The risk of worker safety when working on high on the water surface.	-Providing labor protection for workers (safety belts, life jackets, lifesaver,...) and monitoring the use of -To entrust followers for timely response if someone is drowning or other accidents water
		Trees, some wild individuals may be harmed by a lack of consciousness workers.	-Restricted area disturbance in the smallest range -Manual luminescent, no luminescent outside the construction, the worker is not firmly removed from the plant -Supervise workers ' compliance with the Code of conduct
Bridge No.5 (Km 18+500)	Two sides of the bridge are home, about 50 m. Arable land runs along the path to the bridge about 200m. The project will swipe the route with the number 1, replacing the	Disturbance, disruption of waterway traffic and road.	-Set signs, the area is under construction so that people know and restrict moving into the dike. -Construction in the form of a projection, do not execute the construction on 1 paragraph is too long. -Providing labor protection for workers (safety belts, life jackets, lifesaver,...) and monitoring the use of -To entrust followers for timely response if someone is drowning or other accidents water.

Location	Features	Specific impact	Specific mitigation measures
	target and the sea, fixing the railing, flattening of the bridge with concrete stones, reinforced feet natural roof with 2 rows of the original crucibles (8 ÷ 10) cm , L = 4, 5m, layout 8 plants/M.	Safety risk when working on high, under water.	-
		Construction materials can be spilled to the cultivated ground.	-Be sure not to waste, spilling material into arable land, pond
		Obstruct the operation of transporting materials and agricultural products to/from the cultivation area	-Schedule construction Avoiding peak crop time -Ask workers to assist farmers to move when carrying supplies and agricultural products through the bridge during the construction period
Bridge No.6 (Km 21+500) 	The paths are pretty much green, and there are no homestays near the bridge. The project will swipe the sea dike connection with Bridge No. 6 and the coastline covers the status, replacing the pepper and bridge-top warning, refixing the balustrade, dropping the	Disturbance, traffic disruption	-Set signs, the area is in construction so that people know and not move into the dike. -Construction in the form of a projection, do not conduct construction on 1 paragraph is too long.
		The risk of worker safety when working on high on the water surface. Insects that can inflict injuries to workers	-Equipment for labor protection for workers (life jackets, lifesaver,...) and monitoring the use of -Adherence to safety rules when working on high
			Warnings and instructions for workers on the way of treatment, first aid when insects attack

Location	Features	Specific impact	Specific mitigation measures
	sand smatting to create the carpet of stone carpets combining the stone of the bridge.	+ Trees outside the scope of construction areas, some wild individuals may be harmed by lack of conscious workers.	-Restricted area disturbance in the smallest range -Manual luminescent, no luminescent outside the construction, the worker is not firmly removed from the plant -Supervise workers ' compliance with the Code of conduct

Location	Specific impact	Specific mitigation measures
 Salt-stopping drain will be upgraded	Construction materials can be dropped from high risk endangering the person and means of transport below.	-Material Mesh Crank -The layout of the people, the traffic guide when the construction takes part in the road -Placing the warning and barricades at the beginning, the end of the line is on the dam, at the intersection of the route with the countryside route so that the means of traffic know and redirect the circulation does not move into the construction area;
	Safety risks when workers work on high	Strictly monitor compliance with safety rules when working on high in the ECOP
	Disturbance of water collection activities	Notify people before the construction at least 1 month
Sewers	Disturbance, road traffic disruption	-Set signs, the area is under construction so that people know and restrict moving into the dike. - Construction in the form of a projection, do not conduct construction on 1 paragraph is too long.
	Disturbance of agricultural production activities, water use	Notification to affected households prior to the start of at least 1 month
	+ Risk of sliding the soil in the cliffs and roofs at the underground sewer.	-The time of construction must be on dry season, low tide (Month 12 to 4). The design of the soil and the roofs is designed to ensure safety; -Use a canvas covering the unfinished sloping roofs at night and the warning of the sea, and rope around the sloping roofs with slip-and-land risks;

Location	Specific impact	Specific mitigation measures
		-Observe a regular risk of new roof slippage; -Avoid focusing on people and vehicles on top and at the feet of unstable sloping roofs;
	+ Dust when digging the soil during the dry season.	-Daily proceed to clean up material falling around the area of construction near the residential area With a wall mounting, barrier avoids dust dispersing to the surrounding area.
New Bridge construction locations in Thailand square 	Change the area's local landscape.	-Restricted area disturbance in the smallest range -Manual luminescent, no luminescent outside the construction, the worker is not firmly removed from the plant
	Noise due to piling	-Choose the construction method of pressing pile instead of hammer close to noise restriction -If the construction is made by a piling measure, avoid breeding season (Oct-Mar) of many species
	Disturbance, disruption of waterway traffic and the loss of the local people's boat stations.	-Notice the time of construction and detailed construction plans before the start time of 01 months for the people to actively adapt -Setting up a docking station for residents. -Set warning seas, lamps, float waterway traffic buoy to ensure safety
	Insects can inflict injuries to workers.	-Fully equipped footwear, hats, gloves and protective clothing for workers and strictly supervise the use -Ask the workers to observe during the luminescent, if seen insects before the name should be driven, not killing them. - A closed camp for fighting insects entering the camp. Planting lemongrass and applying other natural remedies to prevent insects into the farm
Km 18+500: Residential clusters	Odors from dredging material	- Must be equipped with labor protection equipment (the page) for workers. -Shield at the end of the wind avoiding spreading smell to the surrounding population.
	Safety risks to people when materials drop, landslides near the home, on roads, or when construction machines operate.	-Daily proceed to clean up material falling around the area of construction near the residential area -Mounting anti-wall, rugged barricades and dangerous warnings around holes, ditches are on the construction. -The layout of the scene, the traffic guide when the construction takes part in the road

Location	Specific impact	Specific mitigation measures
	Social disturbance due to centralized workers.	-Regularly remind and supervise workers about compliance with the Code of conduct.

b. **Measures to minimize the specific impact on the river dike**

The specific impacts and risks of building a sea dike route have been identified in section 3.5 including (i) the impact of local flooding; (ii) increased turbidity, deterioration of water quality affecting aquaculture; (iii) Odor arising from the dredging process (iv) control of the risk of slump, slip on the river bank; (v) Risks for workers ' safety and health when working on high; (vi) The risk of community safety in the area of construction of the drain.

The following measures will be carried out by the contractor when executing a river dike to minimize the impacts and risks mentioned above;

(i) Reduce the impact of dredging operations

Detailed design consultancy will construct the outline of the dredging material management plan as instructed in Appendix 2 topics to take measures and forecasts to mitigate the environmental and social impacts during the dredge process , temporary storage and transportation of materials to the area of construction of the dike glands. Prior to commencement of the contractor, the plan will be detailed and the investor approves.

(ii) Implementing ECOP

(iiI) Take the specific measures outlined below and in the table 4.3 prior notice to the affected households at least 1 week prior to dredging in each region and 3 months for the construction of the drain.

-Organizing training to improve the sense of occupational safety for workers before the start of construction and need to continue to remain during the construction period.

-The organization of periodic health examinations for workers working in the project process.

Water pumps in locations with a local flooding risk, not to stagnant water

A ground, filling the sunken cells with no condensation in areas where prison control is needed.

-The camp and the school office must be way sensitive works such as temples, schools... at least 100m; Material is not in the range of 50 meters since these works

-Observe River turbidity during dredging and suspension of dredge when the excessive turbidity is seen

-Water control leaks from the temporary material collection sites, water leakage leaks flowing into the river and prevents the flow of agricultural land or aquaculture ponds

-Monitoring the pH water leak, if not standard, must neutralized by lime until the standard pH is new for discharge to the environment

Avoid material links in the range of 50 m wind direction to residential clusters and sensitive works

The whole waste including plastic waste must be collected and poured into the specified place, the organic solid waste collected concentrate then buried, is not discharged on the spot or discharged the river.

-When construction is right during the dry season, low tide (Month 12 to 4). The design of the soil and the roofs is designed to ensure safety;

-Use a canvas covering the unfinished sloping roofs at night and the warning of the sea, and the rope around the sloping roofs with slip-and-land risks;

-Observe a regular risk of new roof slippage;

-Avoid focusing people and vehicles on the top and at the feet of the unstable sloping roofs;

-Set the alert and barricades at the beginning, the end of the line is construction on the dike, at the intertopic nodes with the rural transport route so that the means of traffic know and redirect the circulation do not move into the construction area;

-Remind workers to comply with the labor regulations causing the fire and explosion to affect the surrounding population.

Table 4. 3. Measures to minimize the specific impact on the river dike

Location	**Specific impact**	**Mitigation measures**
Ben Ba River Dike		
Km 0 –Km 3+700 	Dredging operation	-Notify people of construction plan before the start of at least 01 month. -Observe River turbidity during dredging and suspension of dredge when the excessive turbidity is seen -Water control leaks from the temporary material collection sites, water leakage leaks flowing into the river and prevents the flow of the label, sugarcane or aquaculture ponds. - Monitoring the pH of water leak, if not standard, must neutralized by lime until the pH reaches the standard for discharge into the environment
	Risk of sliding soil in the cliffs and roof.	-Use a canvas covering the unfinished sloping roofs at night and the warning of the sea, and rope around the sloping roofs with slip-and-land risks; -Observe a regular risk of new roof slippage; -Avoid focusing on people and vehicles on top and at the feet of unstable sloping roofs;

Location	Specific impact	Mitigation measures
Km 3+700 to Km 4+100: Residential area 	Odors from dredging activities	- Providing labor protection (the page) for workers -Avoid material links in the range of 50 m wind direction to residential clusters and sensitive works - Shield at the end of the wind avoiding spreading odors to surrounding populations.
	Risk of sliding soil in the cliffs and roof.	- Use a canvas covering the unfinished sloping roofs at night and the warning of the sea, and rope around the sloping roofs with slip-and-land risks; - Observe a regular risk of new roof slippage; -Avoid focusing people and vehicles on the top and at the feet of the unstable sloping roofs;
	Social disturbance	-Avoid construction at night, or have to consult and notify the community if not avoidable -Temporary road when the construction disrupts traffic -Strict oversight of worker code compliance
At Km3 +700:: The general Hospital of Cu Lao Dung District 	Odors from dredging activities	-Provide sufficient labor protection (page) for workers -No material set in the range of 50 m -Shielding wind-driven end from spreading odors to surrounding populations. -Transporting material away from temporary link
	Loss of order due to focus worker	-Avoid to construction at night -Strict oversight of worker code compliance
	Noise, dust, safety risks from the construction operation	-Not to the machine, the running media does not load more than 2 minutes -No construction at night -Do not file temporary means, supplies and waste in the range 20 from the hospital portal
At Km 3+800 Doan Van To high school	Odors from dredging activities	-Equipment for Labor Protection (page) for workers No temporary files, supplies, and waste in the range of 20m since the school portal

Location	Specific impact	Mitigation measures
	Noise, dust, safety risks from the construction operation	-Not to the machine, the running media does not load more than 2 minutes -Avoid disturbance of area at peak time to class and Tan school
	Impact on students	-Workers must adhere strictly to the code of conduct when working in the region, not arguing, speaking, profanity -Restriction on conducting construction activities in time to class and Tan Truong
An Minh Pagoda 	Influence the respect of the temple	Notify people of construction plan before the start of at least 01 week. - closely monitor the compliance with the Code of Conduct when working close to the temple; - No construction before 7 am and after 6 pm, or during specific days and times at the request of the temple; - Do not store materials or rubbish in the temple area from 50m; - Stop the construction activities if the temple has reviews complained, implementation of mitigation measures until the temple satisfied. All complaints must be recorded; - Avoid or limit construction activities on days 1, 15 and monthly lunar major holidays.
	Social impact	Workers must strictly adhere to the code of conduct when working in the region
	Odors from dredging activities	-Equipment for Labor Protection (page) for workers -Avoid material link within 50 m Shield at the end of the wind avoiding spreading odors to surrounding populations.
Dai An 1 Primary school 	Odors from dredging activities	- Providing labor protection (the page) for workers -Avoid material link within 50 m - Shield at the end of the wind avoiding spreading odors to surrounding populations.

Location	Specific impact	Mitigation measures
	Impact on students	-Workers must strictly adhere to the code of conduct when working in the region -Limit the execution of construction activities in time to class and Tan Truong
At Km 4+100: Ben Ba Market 	Odors from dredging activities	- Must be equipped with labor protection equipment (the page) for workers -Avoid material link within 50 m Shielding wind-driven end from spreading odor
	Disturbance of traffic and order	-Avoid material link within 50 m - Put signs - Avoid unloading supplies, waste in rush hour -
Km 4+100–Km 19+522 	Dredging operation	Notify people of construction plan before the start of at least 01 month. -Observe River turbidity during dredging and suspension of dredge when the excessive turbidity is seen -Water control leaks from the temporary material collection sites, water leakage leaks flowing into the river and prevents the flow of the label, sugarcane or aquaculture ponds. - Monitoring the pH of water leak, if not standard, must neutralized by lime until the pH reaches the standard for discharge into the environment
	Risk of sliding soil in the cliffs and roof.	- Time for sewer construction to the dry season, low tide (December to April). Grader and the roof covering according to a slope designed to ensure safety;Use a canvas covering the unfinished sloping roofs at night and the warning of the sea, and rope around the sloping roofs with slip-and-land risks; -Observe a regular risk of new roof slippage; Avoid focusing on people and vehicles on top and at the feet of unstable sloping roofs;

Location	Specific impact	Mitigation measures
	Insects can attack causing injury to workers.	- equiping shoes, hat, gloves and protective clothing labor of workers and closely monitor the use - Require workers to observe while luminescent, if insects before the name should scare away not kill them - camps enclosed to prevent insects from entering the camp. Planting lemongrass and apply measures to prevent natural insect into camp
Km 6+400: Ho Chi Minh Temple 	Affect the sanctuary of the temple	- No construction before 7 am and after 6 pm, or during specific days and times at the request of the temple; - Do not store materials or rubbish in the temple area from 50m; - Stop the construction activities if the temple has reviews complained, implementation of mitigation measures until the temple satisfied. All complaints must be recorded; - Avoid or limit construction activities on days 1, 15 and monthly lunar major holidays.
	Odors from dredging activities	- Providing labor protection (the page) for workers -Avoid material links in the range of 50 m wind direction to residential clusters and sensitive works - Shield at the end of the wind avoiding spreading odors to surrounding populations.
Km 7+600: has a pagoda 	Affect the sanctuary of the temple	- Notify people of construction plan before the start of at least 01 month. - Camps and site offices have at least 100 meters from the temple; - Training for workers on environmental issues, including training on the Code of Conduct when working close to the temple; - No construction before 7 am and after 6 pm, or during specific days and times at the request of the temple; - Do not store materials or rubbish in the temple area from 50m; - Stop the construction activities if the

Location	Specific impact	Mitigation measures
		temple has reviews complained, implementation of mitigation measures until the temple satisfied. All complaints must be recorded; - Avoid or limit construction activities on days 1, 15 and monthly lunar major holidays.
	Odors from dredging activities	- Providing labor protection (the page) for workers -Avoid material links in the range of 50 m wind direction to residential clusters and sensitive works - Shield at the end of the wind avoiding spreading odors to surrounding populations.
Tuyến đê sông Cồn Tròn		
Km 0 - Km 8+200 Both sides mainly shrimp ponds, 100 meters from the shores of agricultural land, sparsely populated 	Dredging operation	Notify people of construction plan before the start of at least 01 month. -Observe River turbidity during dredging and suspension of dredge when the excessive turbidity is seen -Water control leaks from the temporary material collection sites, water leakage leaks flowing into the river and prevents the flow of the label, sugarcane or aquaculture ponds. - - Monitoring the pH of water leak, if not standard, must neutralized by lime until the pH reaches the standard for discharge into the environment
	Risk of sliding soil in the cliffs and roof.	- Time for sewer construction to the dry season, low tide (December to April). Grader and the roof covering according to a slope designed to ensure safety;Use a canvas covering the unfinished sloping roofs at night and the warning of the sea, and rope around the sloping roofs with slip-and-land risks; Use a canvas covering the unfinished sloping roofs at night and the warning of the sea, and rope around the sloping roofs with slip-and-land risks; -Observe a regular risk of new roof slippage; - -Avoid focusing on people and vehicles on top and at the feet of unstable

Location	Specific impact	Mitigation measures
		sloping roofs;
Km 8+200 to km 8+400: residential district Party Cu Lao Dung District 50 meters from the construction site  	Odors from dredging activities	- Providing labor protection (the page) for workers - reduce the maximum period of temporary storage of materials in this area - Shielding downwind avoid odor emissions to the surrounding population.
	Safety risks	Notify people of construction plan before the start of at least 01 month. - Place barricades, signs, warning prohibit unauthorized person enters the construction area
	Aesthetic impact area commissioner and residential district	- Collect all the materials, construction waste if spillage area commissioner and residential district -Avoid material links in the range of 50 m wind direction to residential clusters and sensitive works - closely monitor the compliance with the code of conduct of workers
	Incidents river erosion	- Always monitor shoreline erosion phenomenon of the construction site for timely processing and reporting
	Risk of sliding soil in the cliffs and roof.	- Time for sewer construction to the dry season, low tide (December to April). Grader and the roof covering according to a slope designed to ensure safety; Use a canvas covering the unfinished sloping roofs at night and the warning of the sea, and rope around the sloping roofs with slip-and-land risks; -Observe a regular risk of new roof slippage; - Avoid focusing on people and vehicles on top and at the feet of unstable sloping roofs;
	Social impact	- closely monitor the compliance with the code of conduct of workers

Location	Specific impact	Mitigation measures
Km 8+400 to km 11+242  Mainly cropland and aquaculture ponds	Dredging operation	- Notify people of construction plan before the start of at least 01 month. -Observe River turbidity during dredging and suspension of dredge when the excessive turbidity is seen -Water control leaks from the temporary material collection sites, water leakage leaks flowing into the river and prevents the flow of the label, sugarcane or aquaculture ponds. - Monitoring the pH of water leak, if not standard, must neutralized by lime until the pH reaches the standard for discharge into the environment
	Risk of sliding soil in the cliffs and roof.	- Time for sewer construction to the dry season, low tide (December to April). Grader and the roof covering according to a slope designed to ensure safety; Use a canvas covering the unfinished sloping roofs at night and the warning of the sea, and rope around the sloping roofs with slip-and-land risks; -Observe a regular risk of new roof slippage; - -Avoid focusing on people and vehicles on top and at the feet of unstable sloping roofs;
	Insects can attack causing injury to workers.	equiping shoes, hat, gloves and protective clothing labor of workers and closely monitor the use - Require workers to observe while luminescent, if insects before the name should scare away not kill them -
River dike route Vam Ho Lon 	Dredging operation	Notify people of construction plan before the start of at least 01 month. -Observe River turbidity during dredging and suspension of dredge when the excessive turbidity is seen -Water control leaks from the temporary material collection sites, water leakage leaks flowing into the river and prevents the flow of the label, sugarcane or aquaculture ponds. - - Monitoring the pH of water leak, if not standard, must neutralized by lime

Location	Specific impact	Mitigation measures
		until the pH reaches the standard for discharge into the environment
	Risk of sliding soil in the cliffs and roof.	- Time for sewer construction to the dry season, low tide (December to April). Grader and the roof covering according to a slope designed to ensure safety; Use a canvas covering the unfinished sloping roofs at night and the warning of the sea, and rope around the sloping roofs with slip-and-land risks; -Observe a regular risk of new roof slippage; - -Avoid focusing on people and vehicles on top and at the feet of unstable sloping roofs;
	Insects can attack causing injury to workers.	- Equiping shoes, hat, gloves and protective clothing labor of workers and closely monitor the use - Require workers to observe while luminescent, if insects before the name should scare away not kill them - Camps enclosed to prevent insects from entering the camp. Planting lemongrass and apply measures to prevent natural insect into camp.
Position to build new sewers 	local flooding	water pumps, leading the line in locations with local water risks, do not let stagnant water - fill the low-lying land not for standing water in these areas to control stagnant.- Time for sewer construction to the dry season, low tide (December to April). Grader and the roof covering according to a slope designed to ensure safety;
	Odors from dredging activities	Providing labor protection (the page) for workers -Avoid material links in the range of 50 m wind direction to residential clusters and sensitive works - - Shield at the end of the wind avoiding spreading odors to surrounding populations.
	Incidents like landslides	- Always monitor shoreline erosion phenomenon of the construction site for timely processing and reporting

Location	Specific impact	Mitigation measures
position to build new sluices 	local flooding	- water pumps, leading the line in locations with local water risks, do not let stagnant water - Advance notice to the authorities and local people to actively arrange the crop.
	Odors from dredging activities	Providing labor protection (the page) for workers -Avoid material links in the range of 50 m wind direction to residential clusters and sensitive works - Shield at the end of the wind avoiding spreading odors to surrounding populations.
	Incidents like landslides	- Always monitor shoreline erosion phenomenon of the construction site for timely processing and reporting
Build new location earth dam 	local flooding	- water pumps, leading the line in locations with local water risks, do not let stagnant water - grader, fill the low-lying land not for standing water in these areas to control stagnant. Notify people of construction plan before the start of at least 01 month.

c. Mitigation measures specific impact on route 933B and bridge construction locations.

The construction contractor route 933B will perform ECOP and measures to minimize the impact characteristics outlined below and in Table 4.4

– Set up walls with iron sheet 2m high at the location for building the bridge, regular maintenance equipment with high noise arises

– regularly watering route under construction in order to reduce the spread of dust.

– Put warning signs, signs, signs roadworks, reduced speed signs in the construction area, with lights at night on the road under construction. .

– Adopt measures to minimize the impact of road construction to limit the impact to sensitive objects.

– manage and educate construction workers so as not to affect the security situation in order on the route, especially the position of the object sensitivity.

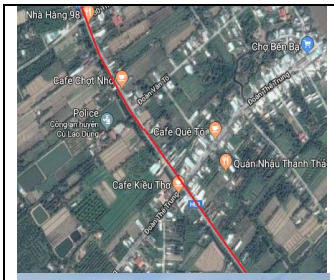
Table 4. 3. Mitigation measures specific impact on route 933B

Location	Impact and specific risks	Mitigation measures
Km 9+974,46 to km 11+854,48: This section has a sparsely populated population, the closest distance between 2 households is 50m, the two are mainly farmland planted with coloured flowers, sugarcane, without aquaculture ponds 	+ Soil digging, temporary set material during road construction can spill into the flowers, sugarcane damaging.	- Chests, shielding, collection and material excavated
	+ Workers can freely customize branches, picking fruit.	- Prohibit workers are not junk, fruit picking or damaging trees
	+ Risk of traffic security when cattle (buffalo, cows...) Crossing the road.	Put warning signs, signs, construction sites, billboards deceleration in the construction sector, with lights at night on the road under construction.
Km 11+200: On the left there is district Cu Lao Dung line 100m route 	+Dust, waste and building materials can cause loss of regional cosmetics. +increasing the number of machines, equipment and means of transport on the route will increase the risk of traffic	- Watering restrictions arising dust, especially in hot and dry days near rush hour traffic. - Waste collection and building materials to the prescribed place - Limit the time for temporary gathering, transporting materials in shortest time
Km 11+800: The right side of Cu Lao Dung's political enrichment Center is a 120m route 	-Traffic on the road to school can be disturbed, increase the risk of traffic safety, especially in time to class and school	Put warning signs, signs, construction sites, billboards deceleration in the construction sector, with lights at night on the road under construction.
	-Dust, waste and building materials can cause the loss of regional cosmetics.	- Watering restrictions arising dust, especially in hot and dry days near rush hour traffic. - Waste collection and building materials to the prescribed place - Be equipped with labor

		protection for workers (masks, goggles, ...)
	-Noise will also affect the teaching and learning activities.	- Measures to limit the impact of noise, such as closing windows, windows. - The media will be checked periodically and oil change to ensure that machinery and equipment with high performance and efficient operation of machines ...; - Plan and allocate time construction means regrouping reasonable; - For workers who operate near the equipment and machinery generated noise restrictions required and equipped media labor protection (earplugs, helmets silencers, ..) accordingly.
km11+854,48 to km 25+550		
Km 11+854,48 to Km 12+500: This section is sparsely populated, with the closest distance between two households being 50 m. 	+ earthwork, temporary set material during road construction can spill into the field damaging the logan.	- Shielding, strapless, cover material not to spill beyond the temporary yard - Making drains around the yard for temporary, escape of water seeping field
	+ workers can freely discretionary the spike, picking fruit.	- Prohibit workers are not junk, fruit picking or damaging trees
Km 12+100: Cu Lao Dung General Hospital 	+ disorderly due to centralized workers influencing people's resting processes.	- Do not apply before 7 am and after 6 pm, or during specific days and times at the request of the hospital management. - Do not store or waste materials from hospitals in the region of 50m; - Stop the construction activities if there is a

		hospital management board complained, implementation of mitigation measures until satisfied MB hospital. All complaints must be recorded; - Place signs, signaling the area under construction so that people know and do not move on the road.
	+ dust, waste and building materials can cause loss of regional aesthetics.	Watering restrictions arising dust, especially in hot and dry days near rush hour traffic. - Waste collection and building materials to the prescribed place - Be equipped with labor protection for workers (masks, goggles, ...)
	Increasing the number of machinery, equipment and transport vehicles on the route will increase the risk of traffic	Put warning signs, signs, construction sites, billboards deceleration in the construction sector, with lights at night on the road under construction.
Km 12+200 Doan Van To High School  Dai An 1 Primary school 	+ Traffic on the road to school may be disturbed, increase the risk of traffic safety, especially in time to class and tan school.	- Measures to limit the impact of noise, such as closing windows, windows. The media will be checked periodically and oil change to ensure that machinery and equipment with high performance and efficient operation of machines ...
	+ Noise affecting the teaching and learning.	
An Minh Pagoda	+ language, inappropriate behavior of workers	- Camps and site offices have at least 100 meters from the temple;

	can affect the reverence of pagodas, especially on full day, Day 1 and holidays as holidays.	- Do not apply before 7 am and after 6 pm, or during specific days and times at the request of the temple management committee; - Do not store materials or rubbish in the temple area from 50m; - Stop the construction activities if MB temples comments complained, implementation of mitigation measures until satisfied MB temple. All complaints must be recorded; - Avoid or limit construction activities on major holidays. - Reminders and closely monitor adherence to the code of conduct of workers
	Traffic on the road to the temple can be disturbed, increasing the risk of traffic safety, especially on the full day, the 1st day and the holidays as the ceremony.	- Limit the construction activities during the full moon day, the 1st of religious holidays
Km12+350: public safety Cu Lao Dung 	-Dust, noise, waste and building materials can cause loss of regional fine	Watering restrictions arising dust, especially in hot and dry days near rush hour traffic. - Waste collection and building materials to the prescribed place
Km 12+500 to Km 12+904,48: Residential concentration	+ Dust, noise affecting households and households on the side of the road	To inform population clusters on the construction plan - Watering with a moderate amount of dust generated limited during

 		excavation, embankment. - Avoid performing the construction activities emit loud noise before 7am, after 21 h and between 11-13h;
	+ Obstruct, disturbance of the entrance to the house and works on the road	- Collection and transportation of excavated soil to avoid obstructing the entrance of people and buildings. - Construction on schedule, not stagnant, stretching to avoid affecting too long to process people's transport.
	+ Risk of accidents in the deep digging to execute the sewer route at the crossroads.	Put warning signs, signs, construction sites, billboards deceleration in the construction sector, with lights at night on the road under construction.
	+ Weak construction of deep digging pits can be sunk, cracked.	- Use Larsen against the wall during the construction of the pit - Always monitor the subsidence phenomenon, cracked construction areas for timely reporting and handling - Limit the use of vibrators in this area.
Km 12+600 Ben Ba Market 	+ Traffic on the road to the market can be disturbed, increase the risk of traffic safety, especially during morning and afternoon peak hours.	- Place signs, signaling the area under construction so that people know and do not move on the road. - Limiting the maximum duration of temporary gathering supplies, waste and construction machines in the market area Avoid unloading supplies and waste during peak hours
	+ Dust, noise, waste and building materials can cause	Watering restrictions arising dust, especially in hot and dry days near rush

	loss of regional aesthetics.	hour traffic. - Waste collection and building materials to the prescribed place
the People's Committee of Cu Lao Dung District 	-Dust, noise, waste and building materials can cause loss of regional aesthetics.	Watering restrictions arising dust, especially in hot and dry days near rush hour traffic. - Waste collection and building materials to the prescribed place
Km 12+904,48 to km 25+550: cultivated land  	hampers the operation of transporting materials and agricultural products when the road surface is disturbed, especially at the intersection positions with horizontal lines	Put warning signs, signs, construction sites, billboards deceleration in the construction sector, with lights at night on the road under construction.
	materials and waste that can spill into the cultivated land of the population causing damage to crops, congestion of drainage	-Waste, building materials to the right place the regulations and the contract with the unit collectors to transport
	+ check high-altitude to about 30cm, so do not hinder people's travel and down.	- Makes connect smoothly stroked lines at intersections
	some passages near the route have small channels. However during the construction process, limiting the falling material should not affect the canals glands.	- - Book signage, signaling the area under construction so that people know, careful movement and transport vehicles with moderate tonnage. Planning construction time to avoid peak season

Km 13+950: the center for regular education – vocational schools of CU Lao Dung 	+ traffic on the road to school may be disturbed, increase the risk of traffic safety, especially in time to class and Tan school	Place signs, signaling the area under construction. - Limit the activities to stop parking, loading and unloading of material in peak hours
	+ dust, waste and building materials can cause loss of regional aesthetics.	- Waste collection, building materials to the prescribed place and awaiting collection unit to collect and transported. - Be equipped with labor protection for workers (masks, goggles, ...).
	Noise will also affect the teaching and learning activities.	- Plan to avoid this road construction through to the season - Announced the construction plan for schools to apply measures to limit the impact of noise: closed glass window.
Km 14+164: Martyrs ' cemetery in Cu Lao Dung 	Dust, waste and construction materials can cause loss of regional fine	-Waste, building materials to the right place the regulations and the contract with the unit collectors to transport
Km 16+900 to Km 17+100: Residental Phan Thanh Hon town	+ Dust, noise affecting the households	- Watering with a moderate amount of dust generated limited during excavation, embankment. - Avoid performing the construction activities emit loud noise before 7am, after 21 h and between 11-13h;
	+ Obstruct, disturbance of the entrance to the house and works on the	- Make temporary path when traffic temporarily interrupted bullet - Collection and gathering

	road	soil excavation and embankment, avoid gathering near the entrance of the people.
	+ Risk of accidents in the deep digging to execute the sewer route at the crossroads.	- Place signs, warning, signaling fenced area under construction so that people know, be careful traveling through this area.
	+ Weak construction of deep digging pits can be sunk, cracked	- Use Larsen against the wall during the construction of the pit - Always monitor the subsidence phenomenon, cracked construction areas for timely reporting and handling - Limit the use of vibrators in this area.
Km 17+100: There are 1 pagodas around 450m from the road. 	language, inappropriate behavior of workers can affect the reverence of pagodas, especially on full day, Day 1 and holidays as holidays.	- Do not store materials or rubbish in the temple area from 50m; - Stop the construction activities if MB temples comments complained, implementation of mitigation measures until satisfied MB temple. All complaints must be recorded; - Avoid or limit construction activities on major holidays.
	Traffic on the road to the temple can be disturbed, increase the risk of traffic safety, especially in the full moon, the 1st day and the holidays as the ceremony.	- Place signs, signaling the area under construction so that people know and travel restrictions at the same time to the temple.
Km 19+000 to Km 19+100: Residential clusters	+ Dust, noise affecting the households	- Watering with a moderate amount of dust generated limited during excavation, embankment.

		- Avoid performing the construction activities emit loud noise before 7am, after 21 h and between 11-13h;
	+ Obstruct, disturbance of the entrance to the house and works on the road	- Collecting and gathering soil excavation and embankment, avoid gathering near the entrance of the people
	+ Risk of accidents in the deep digging for construction.	- Place signs, signaling the area under construction so that people know and do not move on.
	+ Weak construction of deep digging pits can be sunk, cracked	Use Larsen against the wall during the construction of the pit - Always monitor the subsidence phenomenon, cracked construction areas for timely reporting and handling - Limit the use of vibrators in this area.
Km 20+400 to Km 21+200: Residential clusters 	+ Dust, noise affecting the households	Watering with a moderate amount of dust generated limited during excavation, embankment. - Avoid performing the construction activities emit loud noise before 7am, after 21 h and between 11-13h;
	+ Obstruct, disturbance of the entrance to the house and works on the road	- Construction on schedule, not stagnant, stretching to avoid affecting too long to process people's transport. - Collecting and gathering soil excavation and embankment, avoid gathering near the entrance of the people, the buildings along the street.
	+ Risk of accidents in the deep digging for construction.	- Place signs, barricades, warning area under construction

	+ Weak construction of deep digging pits can be sunk, cracked	Use Larsen against the wall during the construction of the pit - Always monitor the phenomenon subsidence, cracking the construction area for timely reporting and handling - restrict the use of vibrators in this area.
Km 21+300 to Km 21+600: Residential clusters 	+ Dust, noise affecting the households	Watering with a moderate amount of dust generated limited during excavation, embankment. - Avoid performing the construction activities emit loud noise before 7am, after 21 h and between 11-13h;
	Safety grid	- Appoint a guide and warn drivers of construction machines to avoid collisions in the column and power lines exist
	+ Obstruct, disturbance of the entrance to the house and works on the road	Collecting and gathering soil excavation and embankment, avoid gathering near the entrance of people, buildings roadside. - Make temporary path when traffic temporarily divided
	+ Risk of accidents in the deep digging for construction.	Place signs, warning, barrier area under construction - Fill the pit dug in the shortest time.
	+ Weak construction of deep digging pits can be sunk, cracked	Use Larsen against the wall during the construction of the pit - Track phenomenon subsidence, cracking the construction area for timely reporting and handling

		- Limit the use of vibrators in this area.
Km 23+600: Wath Kós Tung Temple 	language, inappropriate behavior of workers can affect the reverence of the pagoda, especially in the full moon, the 1st day and the holidays such as the Feast, the Lotus ceremony...	Camps and site offices have at least 100 meters from the temple; - No construction before 7 am and after 6 pm, or during specific days and times at the request of the temple management committee; - Do not store materials or rubbish in the temple area from 50m; - Stop the construction activities if MB temples comments complained, implementation of mitigation measures until satisfied MB temple. All complaints must be recorded; - Avoid or limit construction activities on major holidays.
	Traffic on the road to the temple can be disturbed, increase the risk of traffic safety, especially in the full moon, the 1st day and the holidays as the ceremony.	Place signs, signaling the area under construction so that people know and travel restrictions at the same time to the temple. - Limit construction, collecting materials, waste and cleaning of the festival
Km 25+550 to Km 26+719,22: The land is dominated by agricultural land (sugarcane planting) and aquaculture 	+ earthwork, temporary set material during the construction of sugar can be spilled down to the field damaging sugarcane.	Contractor shielding measures, collecting excavated material and regrouping right places. - Supervise construction workers avoid concentrating large volume of excavated soil and material gathered in one place.
	workers can be self-	- contractors reminding

	arbitrary with strict cane	workers and people with mesh shielding.
	affects sugarcane transportation on harvest months (SEP)	- Place signs, signaling the area under construction to transport people to know the car with moderate tonnage. - Strengthening the construction, to avoid stagnation.
	Soils, falling materials can affect the quality of water in shrimp ponds causing damage to aquaculture farming	- During the construction, earth moving, material to be shielded and avoid excess load transport vehicles. - Watering with a moderate amount of dust generated limited during excavation, embankment. - Avoid performing the construction activities emit loud noise before 7am, after 21 h and between 11-13h;
Km 25+600: An Thanh Health Station 1 	+ dust, noise can affect the patient, especially at noon and night time.	- During the construction, earth moving, material to be shielded and avoid excess load transport vehicles. - Watering with a moderate amount of dust generated limited during excavation, embankment. - Avoid performing the construction activities emit loud noise before 7am, after 21 h and between 11-13h;
	+ obstruct traffic at the health station portal	- Place signs, signaling the area under construction so that people know, walk carefully.

Km 27+300: An Thanh Commune 3 	Dust, waste and construction materials can cause loss of regional fine	- Watering with a moderate amount of dust generated limited during excavation, embankment. - Waste collection and building materials prescribed places. - Limit the activities of loading and unloading of materials within 50 meters from the port CPC
Km 27+400: gasoline plants 	-The increase in the number of machines, equipment and means of transport on the route will increase the risk of traffic.	- Avoid collecting supplies, waste and construction means obstruct Driveway petrol station
An Thanh High School 3 building 2 on the left hand 	+ traffic on the road to school may be disturbed, increase the risk of traffic safety, especially in time to class and Tan school	To minimize the construction activities in class and after school hours to - Place signs, signaling the area under construction so that people know, traffic flow travel.
	+ dust, waste and building materials can cause loss of regional aesthetics.	Watering restrictions dust. - Waste collection and building materials in prescribed places.
	+ noise will also affect the teaching and learning activities.	- Announced the construction progress to school and have the restrictive measures such as closing windows, windows. - Plan to avoid execution through this road into season
Km 27+900: Rach Trang church	Language, inappropriate behavior of workers can influence the reverence of,	closely monitor the compliance with the Code of Conduct of the workers - Do not apply before 7

	especially Easter Church, solemn...	am and after 6 pm, or during the day and specific hours required by the temple management committee; - Do not store or waste materials, construction machines stop parking area 50m from the temple; - Stop the construction activities if MB temples comments complained, implementation of mitigation measures until satisfied MB temple. All complaints must be recorded; - Avoid or limit construction activities on major holidays. Avoid applying over this period in the holidays - Place signs, signaling the area under construction so that people know, traffic flow travel.
	Traffic on the ramp to the church can be disturbed, increase the risk of traffic safety, especially Easter, weighted...	closely monitor the compliance with the Code of Conduct of the workers - Do not apply before 7 am and after 6 pm, or during the day and specific hours required by the temple management committee; - Do not store or waste materials, construction machines stop parking area 50m from the temple; - Stop the construction activities if MB temples comments complained, implementation of mitigation measures until

		satisfied MB temple. All complaints must be recorded; - Avoid or limit construction activities on major holidays. Avoid applying over this period in the holidays - Place signs, signaling the area under construction so that people know, traffic flow travel.
Km 28+050: Rạch Tráng market 	+ Traffic on the road to the market can be disturbed, increase the risk of traffic safety, especially during morning and afternoon peak hours.	Place signs, signaling the area under construction so that people know, traffic flow travel. - Limit the material handling operations during peak hours
	+ Dust, noise, waste and building materials can cause loss of regional fine	Watering with a moderate amount of dust generated limited during excavation, embankment. - Waste collection and building materials prescribed places.
Km 28+100 Post office Rach Dien 	Dust, waste and building materials can cause loss of regional aesthetics.	Watering with a moderate amount of dust generated limited during excavation, embankment. - Do not stop construction machine park entrance sure mail - Waste collection, building materials prescribed places.
An Thanh 3 High school. 	+ traffic on the road to school may be disturbed, increase the risk of traffic safety, especially in time to class and Tan school	Waste collection, building materials to the prescribed place and awaiting collection unit to collect and transported. - Avoid materials, waste accounts for roadway - Limit activities during unloading materials to class, after school

	Dust, waste and building materials can cause loss of regional aesthetics.	Watering restrictions dust generated during excavation, embankment. - Waste collection, building materials prescribed places.
	+ noise will also affect the teaching and learning activities.	Announced the construction progress to school and have the restrictive measures such as closing windows, windows. - Avoid applying through school in the season
Km 26+719,22 to Km 30+233,51: The land cultivation 	_ soil, falling materials can affect the quality of water in shrimp ponds causing damage to aquaculture farming	In the course of construction, transport contractors to take measures shielding. - Do not carry terrestrial material excess vehicle weight
	_ earthwork, temporary set material during the construction of sugar can be spilled down to the field damaging sugarcane.	Contractor shielding measures, collecting excavated material and regrouping right places. - Supervise construction workers avoid concentrating large volume of excavated soil and material gathered in one place.
	_ workers can be self-arbitrary with strict cane	- closely monitor the compliance with the Code of Conduct of workers
	_ affects sugarcane transportation on harvest months (SEP)	Place signs, signaling the area under construction to transport people to know the car with moderate tonnage. - Avoid, minimize construction activities in the month collected works sugarcane, shrimp
Route avoidance (Mainly passes through agricultural land and aquaculture ponds, no houses)		

		
	+ soil, falling materials can affect the quality of water in shrimp ponds causing damage to aquaculture farming	To collect materials and waste neat not to spill down agricultural land and irrigation ditches - During construction, transport contractors to take measures shielding materials and waste - not carrying rocks material exceeding vehicle weight
	obstruction of traffic	Avoid, minimize construction activities in the months of collecting works of sugarcane, shrimp - Making frontage roads, road claw connection from the main road to the area of arable land at the intersection with the existing road organic traffic to ensure -.
	+ workers can be self-arbitrary with strict cane	contractors reminding workers and people with a mesh shield - Place signs, signaling the area under construction to transport people to know the car with moderate tonnage. -
	+ workers can be self-arbitrary with strict cane Affects the transport of	contractors reminding workers and people with a mesh shield - Place signs, signaling the area

	sugarcane in the months of Harvest (Sept.).	under construction to transport people to know the car with moderate tonnage.

Table 4. 4. Measures to minimize the impact specific positions in bridge construction

Location	Special effects, risks	Mitigation measures
Construction of New Bridges		
- The bridge works shall be scheduled to avoid the high river flow season;		
- Descriptions on measures for spill prevention, and sedimentation control, surface water flow diversion, reinstatement, etc.		
- Local authority and community shall be informed about the construction works the existing bridge with at least two weeks notice.		
- Equip life jackets, safety belts, ear plugs to workers when building bridge over a river or streamline.		
- Signboards and fences shall be placed and maintained to safely block off access to the two ends of the existing bridge. Allocate staff to guard the site 24 hours per day. Ensure adequate lighting at night time.		
- Life vests and protective equipment are provided to the workers and enforce the use when working in or above water surface, especially during construction of bridge abutments (2-3m high above the water surface);		
- For bridge construction, the waste shall be controlled strictly to restrict discharge or dumping of any wastewater, slurry, waste, fuels and waste oil into the water. All these materials must be collected and disposed of on land at the banks. The slurry and sediment shall also pump to the banks for disposal and shall not be allowed to discharge to the rivers directly;		
- After bridge construction, the works area shall be reinstated.		
- Concrete mixing directly on the ground shall not be allowed and shall take place on impermeable surfaces;		
- All runoff from batching areas shall be strictly controlled, and cement-contaminated water shall be collected, stored and disposed of at the approved site;		
- Unused cement bags shall be stored out of the rain where runoff won't affect it; Used (empty) cement bags shall be collected and stored in weatherproof containers to prevent windblown cement dust and water contamination.;		
- All excess concrete shall be removed from site on completion of concrete works and disposed of. Washing of the excess into the ground is not allowed. All excess aggregate shall also be removed.		
- In the course of bore pile driving, the use of bentonite must be conducted inside a cofferdam made of earth or steel to prevent any		

spillage from overflowing into the environment and all the mixture of soil and bentonite and bentonite spilled over must be collected and the following forms of processing any spillage are recommended - Construction of bridge pier (abutments) on land: spillage of mixture of soil and bentonite although liquefied and bentonite will be primarily handled: Waste solution of bentonite will be collected into a collector drain, sump or cistern to avoid direct discharge within the construction site, then it will be deposited, preliminary dried and transported for disposal at a designated location either for recycling or recovering the betonite; - Construction of piers adjacent to the flow: soil mixed with bentonite, even liquefied, and spilled bentonite will be either moved to storage yards on the shore or placed in containers for depositing or drying and then transported to indicate waste dumps for recycling and recovering the bentonite. - For any in water construction for bridges, there shall be strict waste control plan to restrict discharge or dumping of any directly discharge of wastewater, slurry, waste, fuels and waste oil into the water. All these materials must be collected and disposed at the banks. The slurry and sediment shall also pump to the banks for disposal and shall not be allowed to discharge to the rivers directly; - Reinstatement of watercourse crossings shall be carried out, including generic methods for all watercourse crossings and site-specific methods statements for significant or sensitive watercourse crossings; - After bridge construction, the works area, stream diversion, settlement pond areas and temporary bypasses shall be reinstated to the satisfaction of the ECO and SES.			
Rach Vuot bridge: Km 3+026	Optical pulse bridge construction locations primarily agricultural land and some households living.	Dust, noise affects households	- The media will be checked periodically and oil change to ensure that machinery and equipment with productivity high and operating machinery efficiency ... - Plan and allocate time regrouping construction means reasonable. - For workers who operate near the equipment and machinery generated noise restrictions required and equipped media labor protection (earplugs, helmets silencers, ..) accordingly.

		Affecting transport people	- Construction on schedule, not stagnant, stretching to avoid affecting too long to process people's transport.
Rac Dinh bridge: Km12+25	Optical pulse bridge construction locations primarily agricultural land and a househol dliving. 	Dust, noise affects households	- The media will be checked periodically and oil change to ensure that machinery and equipment with productivity high and operating machinery efficiency ... - Plan and allocate time regrouping construction means reasonable. - For workers who operate near the equipment and machinery generated noise restrictions required and equipped media labor protection (earplugs, helmets silencers, ..) accordingly. .
		Affecting transport people	- Construction on schedule, not stagnant, stretching to avoid affecting too long to process people's transport.
		Water quality in aquaculture ponds near the construction site	- Limit as material falling the canal. - Monitoring the problem cracked, broken bridge works regularly.
Rach day bridge: Km17+276	Optical pulse bridge construction locations primarily agricultural land and a househol dliving.	Dust, noise affects households	- The media will be checked periodically and oil change to ensure that machinery and equipment with productivity high and operating machinery efficiency ... - Plan and allocate time regrouping construction means reasonable. - For workers who operate near the equipment and machinery generated noise restrictions required and equipped media labor protection (earplugs, helmets silencers, ..) accordingly.

			-
		Water quality in aquaculture ponds near the construction site	- Limit as material falling the canal. - - Monitoring the problem cracked, broken bridge works regularly.
Rach Lon Bridge: Km17+808	Optical pulse bridge construction locations primarily agricultural land and a household living.  +	Dust, noise affects households	- The media will be checked periodically and oil change to ensure that machinery and equipment with productivity high and operating machinery efficiency ... - Plan and allocate time regrouping construction means reasonable. - For workers who operate near the equipment and machinery generated noise restrictions required and equipped media labor protection (earplugs, helmets silencers, ..) accordingly.
		Water quality in aquaculture ponds near the construction site	- Limit as material falling the canal. - - Monitoring the problem cracked, broken bridge works regularly.
		Affect commuter transport people	- Construction on schedule, not stagnant, stretching to avoid affecting too long to process people's transport.
Rach Ba Chu bridge : Km18+351	Optical pulse bridge construction locations primarily agricultural land and a household living.	Dust, noise affects households	
		Water quality in aquaculture ponds near the construction site	

		Affecting transport people	- Construction on schedule, not stagnant, stretching to avoid affecting too long to process people's transport.
Rach ngay bridge: Km20+39	Optical pulse bridge construction locations primarily agricultural land and a household living.	Dust, noise affects households	- The media will be checked periodically and oil change to ensure that machinery and equipment with productivity high and operating machinery efficiency ... - Plan and allocate time regrouping construction means reasonable. - For workers who operate near the equipment and machinery generated noise restrictions required and equipped media labor protection (earplugs, helmets silencers, ..) accordingly.
		Affecting transport people	- Construction on schedule, not stagnant, stretching to avoid affecting too long to process people's transport.
		Water quality in aquaculture ponds near the construction site	- Limit as material falling the canal. - - Monitoring the problem cracked, broken bridge works regularly.
Ba Keo Bridge :Km21+998	Optical pulse bridge construction locations primarily agricultural	Dust, noise affects households	- The media will be checked periodically and oil change to ensure that machinery and equipment with productivity high and operating machinery efficiency ...

	land and a household dliving. 		- Plan and allocate time regrouping construction means reasonable. - For workers who operate near the equipment and machinery generated noise restrictions required and equipped media labor protection (earplugs, helmets silencers, ..) accordingly.
		Water quality in aquaculture ponds near the construction site	- Limit as material falling the canal. - Monitoring the problem cracked, broken bridge works regularly.
		Affecting transport people	- Construction on schedule, not stagnant, stretching to avoid affecting too long to process people's transport.
Rach Dui bridge :Km28+640.69	Optical pulse bridge construction locations primarily agricultural land and a household dliving. 	Dust, noise affects households	- The media will be checked periodically and oil change to ensure that machinery and equipment with productivity high and operating machinery efficiency ... - Plan and allocate time regrouping construction means reasonable. - For workers who operate near the equipment and machinery generated noise restrictions required and equipped media labor protection (earplugs, helmets silencers, ..) accordingly. -
		Water quality in aquaculture ponds near the construction site	- Limit as material falling the canal. - Monitoring the problem cracked, broken bridge works regularly.
		Affecting transport people	- Construction on schedule, not stagnant, stretching to avoid affecting too long to process people's transport.

Rach Trang Bridge: Km0+530	Optical pulse bridge construction locations primarily agricultural land and a household dliving. 	Dust, noise affects households	- The media will be checked periodically and oil change to ensure that machinery and equipment with productivity high and operating machinery efficiency ... - Plan and allocate time regrouping construction means reasonable. - For workers who operate near the equipment and machinery generated noise restrictions required and equipped media labor protection (earplugs, helmets silencers, ..) accordingly.

d. Impact mitigation measures during the construction characteristics electric

Only workers are trained and have new certificates are allowed to install, maintain and repair electrical equipment.

Stop power supply and grounding power distribution lines before working on or near the line.

Ensure that work directly conductors made by employees are trained strictly adhere to safety standards and insulation. Qualified staff training or work on the transmission system, distribution achieve the following:

• Distinguish parts with electricity from other parts of the electrical system.

• Determine the voltage of the electrical parts.

• Understanding of the approach the minimum working distance for a specific voltage level. Ensure proper use of the equipment and the safety procedures especially when working near or on parts of the electrical power system.

Workers should not reach the parts open electricity or electrical conductivity even if trained properly, unless:

• The workers are completely isolated from the part of electricity with gloves or other insulating approved.

• The employee is insulated in accordance with the electrical parts or other conductive devices.

• The worker is properly insulated and isolated from any other conductive object (working with power lines).

When maintenance and operation are required in the minimum distance, specific training, safety measures, equipment personal safety and precautions needed to be identified in the program of health and safety . Minimum safety for workers as follows:

• 2-15 kV: 0.6 m

• 15.1 - 35kV: 0.71 m

• 72.6 - 121 kV: 1:01 m

Safety measures when working on high

Check the integrity of the structure before performing work.

Perform some protection rules when working above include technical training in climbing and the use of protective measures when working on high; inspection, maintenance and replacement of protective equipment when working overhead, and rescue workers falling.

Fixed on tower components to facilitate the use of the system of protection when working on high.

Safety belts should be replaced before signs of aging, or broken fibers.

When operating on high power materials, workers should have the safety strap reserves.

The signaling panels and other obstructions should be removed from the column or structure before performing work.

Should use a tool bag was checked to raise or lower the tools or materials to workers on the project.

4.6. Measures to minimize the impact of non-construction investment

Measures to minimize impacts specific to construction afforestation
(i) Propaganda education to raise awareness of conservation of biodiversity for the workers before the start of construction and the need to continue to maintain in time construction.
(ii) Construction unit is responsible for managing its workers. Not letting the active deforestation, hunting birds in the reserve.
(iii) Workers must not stay overnight in the reserve (all subprojects arranged camps for workers at the guard station on the border of the forest folded salty, not penetrate inside)
(iv) The trees are planted in rows additional clearing ensure no use of exotic species, is not harmful to other species, does not affect the biological skin.

Measures to minimize the effect applies to all models of livelihood

Type of support	**Measures to minimize environmental impact**
Cattle breeding	***Position cages:*** as far a living area households as possible The more remote living quarters of households as possible Cages must be located downwind - barns to ensure cool in summer, warm in winter Easy to clean washing, collection and wastewater management and solid waste Away from the road (to ensure biosafety, easy isolation in case of outbreaks) The area of housing and plots separated large enough to ensure the interests of cattle and livestock. ***Waste Management:*** No waste disposal, waste water untreated into the environment build biogical tank if enough animals Clean cages washed daily, weekly hygiene overall landscape management and odor: Planting around the barn area. Trees help shade, windbreaks, CO2, O2. Banning the use of animal feed containing prohibited chemicals, the antibiotics are listed in circular No. 28/2014/TT-on September 4, 2014 of Ministry of agriculture & RURAL DEVELOPMENT (including 21 substances: Cabuterol, cimaterol, clenbuterol, chloramphenicol, Diethylstilbestrol (DES) dimetridazole, Fenoterol, Furazonlidon và Nitrofuran derivatives, isoxuprin, methyl-testoterone, metronidazole, Noz-testorerone 1,

	ractopamine, sabutamol, terbutaline, stilbenes, trenbolone, zaranol, melamine (nồng độ lớn hơn 2,5 mg/kg), bacitracin, carbadox và olaquidox). Prohibition of livestock grazing Farmers brought labor protection when exposed to pets
Poultry	The area of housing and plots separated large enough to ensure the interests of cattle and livestock. - cages to separate the living area households; farms should be located away from residential areas, health centers, markets, schools - Region poultry should be fenced, separated poultry to cattle, quarantine individuals infected poultry - Only the livestock and poultry species listed in the list of those permitted for production and trading in Vietnam - tools and cages must be cleaned regularly and / or after use. - Only poultry slaughtering at least 28 days after vaccination. - Farmers brought labor protection when exposed to pets
Crop	- Apply VietGAP standard, three rose three fell, Management Integrated Pest. Do not violate the prohibitions listed in the Law on Protection and Quarantine, in particular: - Prohibition of storage, sale the infected plants untreated or use the infected seeds untreated on the list of banned in quarantine. - Prohibit Spreads pest. - Prohibit use of agricultural chemicals on the list of banned chemicals in Vietnam or not on the list of agricultural chemicals permitted for use in Vietnam. Measures Management Pest where the need to follow four principles: - Use of the seed, the plant clean, pest infestation - Protect natural enemies - Visitors Council regularly Training to help farmers become expert Methodology: - Quarantine and disinfection to prevent new pests - Apply mechanical measures, catch harmful insects by hand, remove the infected leaves, collect and destroy eggs, etc. - Apply the biological method, ie the use of forms of life to prevent or mitigate the negative impact of harmful insects. This method involves protecting the natural enemy types, create habitat for them, use of probiotics, etc. - Applied Methods of chemistry, is the last option, only selected after applying the methods listed above, but not effective in pest control - Equipment and use labor protection when manipulation of plant protection chemicals. Bottle packaging plant protection products must be collected and disposed of hygiene. - Training program for farmers to include content on the storage, use and disposal of medicines and plant protection, fertilizer and packaging safely for

	humans and the environment, rules safety when using the machinery and equipment - Application of irrigation water saving measures
Aquaculture	- Do not violate the prohibitions listed in Article 6 of the Law on the Protection of Aquatic Resources. - Assessing the quality of the soil (pH, pesticides and heavy metals) sector is expected to make the pond. - Bund ponds brackish water must be high enough to insulate the pond with arable land around, around embankments must trench if beside ponds farmland. - Do not use additives, chemicals and antibiotics in the list of chemicals, antibiotics banned for use in aquaculture. - Do not drop the species infected seafood in aquaculture ponds or self nhienhong water environment and waste discharge effluent into the environment untreated water quality truongGiam periodically to ensure water quality pond.

CHAPTER 5. ENVIRONMENTAL MONITORING PLAN, ORGANIZATION OF IMPLEMENTATION

5.1. The monitoring program and environmental monitoring

The main objective of the environmental monitoring program is to ensure that (a) the negative impacts of the subproject are mitigated; (b) the ESMP is effectively implemented; and (c) ESMP is sufficient to minimize negative impacts. Monitoring of RAP implementation will be conducted separately, the environmental monitoring program will include (a) monitoring compliance with contractor safety requirements during site clearance and construction, (b) monitor the quality of the environment, (c) monitor the performance of the ESMP.

5.1.1. Monitoring the contractor's compliance

Monitoring compliance with the Contractor's safety policy includes three levels of supervision: regular monitoring, periodic monitoring and community-based monitoring, in which:

- Regular monitoring: conducted by CSC under the designation of Soc Trang PPMU. CSC will report periodic monitoring results in the progress reports of the subprojects.
- Periodic monitoring (Once every 3 months): is carried out once every 3 months by the IEMC and results will be reported to the Soc Trang PPMU and WB.
- Community monitoring: Community level monitoring committees are established in accordance with government regulations and under the support of the Soc Trang PPMU.

5.1.2. Environmental monitoring program

In order to ensure an acceptable level of environmental quality, monitoring of dust, noise, vibration, air quality and water quality will be carried out at specific sites likely to be affected by the construction activities or according to the specific requirements of the local government and community. IEMC will be responsible for implementing the monitoring program.

Details of important issues and areas of monitoring will be considered in the implementation of the monitoring program:

- General impact during construction: local inundation; traffic management especially in residential areas; air pollution, noise and dust in residential areas; and water quality in the upper and lower reaches of the construction site, paying attention to impacts related to local people;
- Other impacts: Under agreement with local governments and communities in the preparation of the monitoring program.

Table 5.1 details the contents of the environmental quality monitoring program and estimates the costs for monitoring during construction (4 years).The detailed monitoring program will be prepared during the detailed design phase, where monitoring points are shown

in Figure 5.1. The cost of monitoring is based on ESMP costs. Monitoring indicators are selected in accordance with Vietnamese regulations and should be implemented even if these indicators are not directly related to the impact of the subprojects.

Table 5.1. Monitoring of environmental quality during contruction and oparation phase of the subproject

No	Content	Specific requirements	Applied standard
I	**Construction phase**		
1	**Monitoring waste daily**		Decree No. 59/2007/ND-CP, Decree No. 38/2015 /ND-CP.
a	Supervision	The process of sorting, collection, management and monitoring of solid waste arising during the construction process	
b	Monitoring position	12 positions	
c	Monitoring frequency	Every day	
2	*Monitoring hazardous waste at the site*		Decree No. 59/2007/ND-CP, Decree No. 38/2015 /ND-CP.
a	Supervision	The process of sorting, collection, management and monitoring of solid waste arising during the construction process	
b	Monitoring position	12 positions	
c	Monitoring frequency	Once every 3 month	
	Surface water quality monitoring of the canals is constructed		QCVN 08-MT: 2015 / BTNMT - Column A2
a	Monitoring parameters	: Turbidity, pH, DO, TSS, BOD5, COD, Cl-, grease and oil, coliform.	
b	Monitoring position	- Supervision: 39 points at the locations of rivers/canals/dike construction, underground culverts and traffic bridges (appendix of monitoring drawings for the construction phase), including: + 29 points on the river dyke. + 10 points on the sea dyke of the project area.	
c	Monitoring frequency	Once every 3 month	

4	**Monitoring the quality of excavated soil**		
a	Monitoring parameters	Cu, Fe, Cd, Cr, Pb, Zn, pH, Salinity.	
b	Monitoring position	- 40 points at excavation sites for construction of dykes, culverts and traffic bridges (appendix of monitoring drawings for the construction phase) include: + 30 points on the river dyke; + 10 points on the sea dyke of the project area.	
c	Monitoring frequency	Once every 3 month	
5	**Monitoring air quality**		
a	Monitoring parameters	- Turbidity, Noise, SO_2, CO, NO_x	
b	Monitoring position	- Supervision: 7 points at bridge construction sites on route 933B	
c	Monitoring frequency	- Once every 3 month	
6	Supervision of landslide/canal		
a	Monitoring position	- Along the sides of canals	
b	Monitoring frequency	- Once every 1 month	
II	**Oparation phase**		
1	Monitoring water flow and sedimentation of the canal system and field works (monitoring within 10 years)		
a	Supervision	- Monitoring of water level, sedimentation of canals, monitoring of canals and landslides, cleaning of vegetation, regular maintenance of canal.	
b	Monitoring frequency	- Once every 6 month	
2	**Monitoring the quality of the sewer system** (monitoring within 10 years)		
a	Supervision	- Monitorate and maintenance of culvert quality	

3	**Quality monitoring of dykes** (monitoring within 10 years)		
a	Supervision	- Quality monitoring of dykes	
b	Monitoring frequency	- Once every 6 month	
4	Monitoring landslide of Canal (monitoring within 10 years)		
a	Supervision	- Monitoring landslide of canal	
b	Monitoring frequency	- Once every 6 month	

5.2. Mechanism for implementing the ESMP, tasks of related parties

5.2.1. Mechanism of implementation

The roles and responsibilities for ESMP implementation are shown in Figure 5.1 and Table 5.2

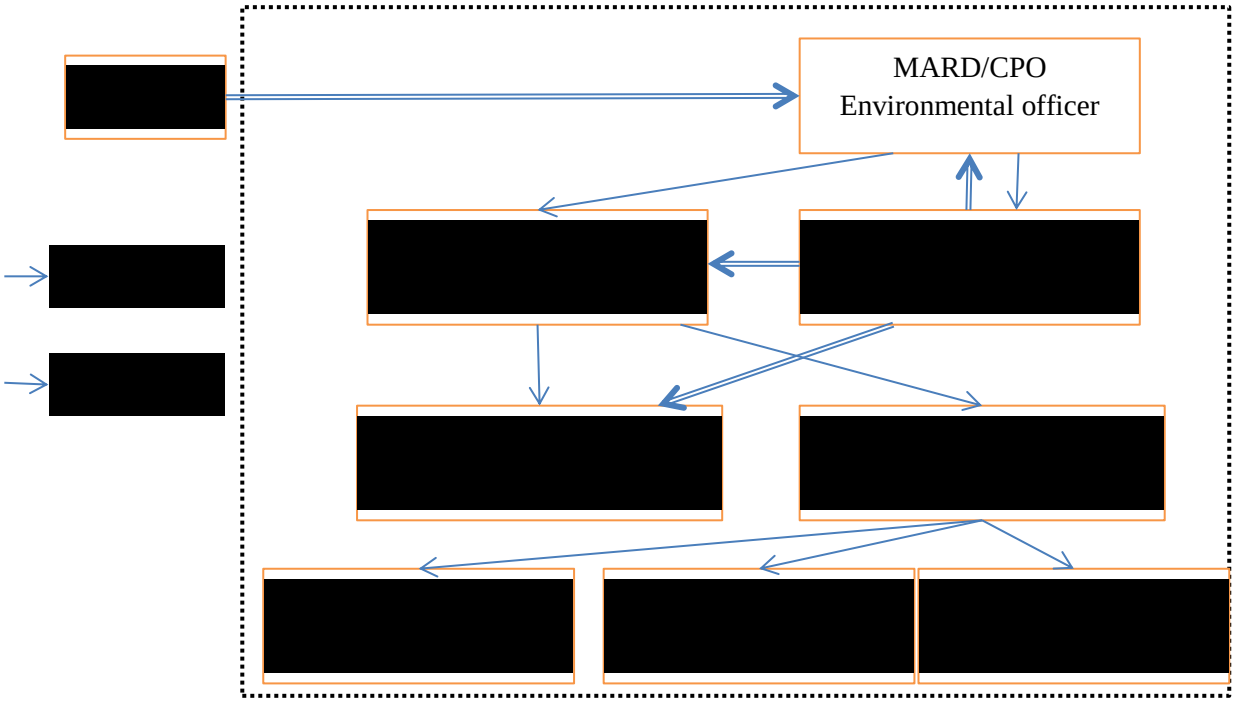


Figure 5. 1. Organization chart for implementation of safety policy.

5.2.2. Responsibilities of the concerned parties

The specific responsibilities of the concerned parties are shown in Table 5.2 below:

Table 5. 1. Roles and responsibilities of stakeholders

Unit	Environmental responsibility
Project Management Unit 2	Overall monitoring and implementing of the project, including the

Unit	Environmental responsibility
(PMU2)	environmental compliance, ensure that the environmental management system is established, allocate sufficient resources to implement ESMP. Arrange an officer in charge of environment, safety and health.
Environmental Officer (PMU 2)	Follow regularly environmental, safety and health issues (XMAS) of project, commanding supervisory consultants and construction contractor to implement C-ESMP mitigation measures and corrective measures. Check, comments and suggestions Environmental management plan of construction contractor, regularly and unexpectedly report about XMAS of supervision consultant and construction contractor. Provide information, go to the field inspection with the inspection teams.
Social safeguards and Resettlement Officer	The PMU will appoint at least one Resettlement and Social Safeguards and Resettlement Officer to address the project's resettlement and social issues, monitor compliance with the Resettlement Policy Framework and the Plan. To participate in the investigation and resolution of complaints concerned to land recovery and social issues.
Environmental consultant	- Consider, check mitigate measure and related estimates in the design. - Contact CPO Board to receive monitoring and reporting guidelines. - Check the implementation of measures to minimize environmental impacts of construction contractors and provide guidance on the implementation of remedial measures. - Report the status of ESMP implementation to PPMU and prepare comments on environmental monitoring in construction phase.
Construction supervision consultant	- Check and approve the Contractor's Environmental Management Plan. - Regularly supervise the implementation of contractor's mitigation measures, direct contractors to take remedial measures when not complying - Submitting monthly environmental, social, safety and health reports for PMU2 - Report to inspection teams
Contruction Contractors	- Compliance the require relate with environmental, safety and health issues. - Arrange an employee in charge of MXAS. - Implement the mitigate measure environment and social impact in the ESMP of sub-project and conditions in the bidding

Unit	Environmental responsibility
	documents/construction contract. - To depute representation of construction team take part in site monitoring which is held by environmental officer (ES) of PPMU. - Implement corrective activity by the guide of environmental officer (CEO) of PPMU and ES
Local governments	Decision No. 80/2005 / QD-TTg, community living in project area will participate in environmental monitoring.
Department of Natural Resources and Environment of Soc Trang	Monitoring the project's environmental compliance when needed
World Bank	Monitoring of ESMP compliance

5.3. Environmental Compliance Framework

5.3.1. Environmental Duties of the Contractors

The contractors firstly shall adhere to minimize impacts that may result from the project construction activities and secondly, apply the mitigation measures stated in the ESMP to prevent harm and nuisances on local communities and the environment caused the construction and operation phases.

- Remedial actions that cannot be effectively carried out during construction should be implemented upon completion of the works (and before issuance of the Works Acceptance Certificates).
- The Contractors*'* duties include but not limit to:
- Comply with relevant legislative requirements governing the environment, public health and safety;
- Work within the scope of contractual requirements and other tender conditions;
- Organize representatives of the construction team to participate in the joint site inspections undertaken by the Environmental Supervisors (ES) of the CSC;
- Carry out any corrective actions instructed by the Environmental Officer (EO) of the TSPMU and the ES;
- In case of non-compliances/ discrepancies, carry out investigation and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impacts;
- Stop construction activities, which generate adverse impacts, upon receiving instructions from the EO and the ES. Propose and implement corrective actions and carry out alternative construction methods, if required, to minimize the environmental impacts; Non-compliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the EO and the

ES.

5.3.2. Contractor's Site Environment Officer (SEO)

The Contractor shall be required to appoint a competent individual as the Contractor's Site Environmental Officer (SEO). The SEO must be appropriately trained in environmental management and possess necessary skills to transfer environmental management knowledge to all personnel involved in the contract. The SEO will be responsible for monitoring the contractor's compliance with the ESMP requirements and the environmental specifications. The duties of the SEO shall include but not limit to the following:

- Carry out environmental site inspections to assess and audit the contractors' site practice, equipment and work methods with respect to pollution control and adequacy of environmental mitigation measures implemented;
- Monitor compliance with environmental protection measures, pollution prevention and control measures and contractual requirements;
- Monitor the implementation of environmental mitigation measures;
- Prepare audit reports for the environmental monitoring data and site environmental conditions;
- Investigate complaints and recommend any required corrective measures;
- Advise the contractor on environment improvement, awareness and proactive pollution prevention measures;
- Recommend suitable mitigation measures to the contractor in the case of non-compliance. Carry out additional monitoring of noncompliance instructed by the EO/ES;
- Inform the contractor and ECO/ES of environmental issues, submit contractor's ESMP Implementation Plan to the ECO/ES, and relevant authorities, if required;
- Keep detailed records of all site activities that may relate to the environment.

5.3.3. Environmental Supervision during Construction

During construction stage, a qualified Construction Supervision Consultant (CSC) reporting to the PPMU shall carry out the environmental supervision. The CSC is responsible for inspecting, and supervising all construction activities to ensure that mitigation measures adopted in the ESMP are properly implemented, and that the negative environmental impacts of the Project are minimized. The CSC shall engage sufficient number of Environmental Supervision Engineers with adequate knowledge on environmental protection and construction project management to perform the required duties and to supervise the Contractor's performance. Specifically ES will:

- Review and assess on behalf of the PPMU whether the construction design meets the requirements of the mitigation and management measures of the ESMP,
- Supervise site environmental management system of contractors including their

performance, experience and handling of site environmental issues, and provide corrective instructions;

- Review the ESMP implementation by the contractors, verify and confirm environmental supervision procedures, parameters, monitoring locations, equipment and results;
- Report ESMP implementation status to PPMU and prepare the environmental supervision statement during the construction stage; and
- Approve invoices or payments.

5.3.4. Independent Environmental Monitoring Consultant (IEMC)

In order to minimize the environmental impacts during construction stage of the Project, the Project owner shall ensure that environmental quality monitoring requirements are established for the project. An Independent Environmental Monitoring Consultant (IEMC) appointed by CPMU shall carry out the monitoring.

- IEMC will be responsible for carrying out environmental sampling, monitoring and marking report during all stages of the Project. Environmental quality monitoring will be report periodically to PPMU (every 06 months in construction stage and in operation stage).
- IEMC will also supply specialized assistance to CPMU and ECO in environmental matters.

5.3.5. Compliance with Legal and Contractual Requirements

The constructions activities shall comply not only with contractual environmental protection and pollution control requirements but also with environmental protection and pollution control laws of the Socialist Republic of Viet Nam.

All the works method statements submitted by the Contractor to the ECO for approval shall also be sent to the ES to see whether sufficient environmental protection and pollution control measures have been included.

The ES shall also review the progress and program of the works to check that relevant environmental laws have not been violated, and that any potential for violating the laws can be prevented.

The Contractor shall copy relevant documents to the SEO and the ES. The document shall at least include the updated work progress report, the updated work measure, and the application letters for different license/permits under the environmental protection laws, and all the valid license/permit. The SEO and the ES shall also have access, upon request, to the Site Log-Book.

After reviewing the documents, the SEO or the ES shall advise the ECO and the contractor of any non-compliance with the contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the SEO or the ES

concludes that the status on license/permit application and any environmental protection and pollution control preparation works may not comply with the work measure or may result in potential violation of environmental protection and pollution control requirements, they shall advise the Contractor and the ECO accordingly.

5.3.6. Environmental Claims and Penalty System

In the compliance framework, if non-compliance with environmental regulations are discovered by ECO/CSC/ES/IEMC during the site supervision, 2% values of interim payment of the contractor of this month will be held back. The Contractor will be given a grace period (determined by CSC/ES) to repair the violation. If the Contractor performs the repairs within the grace period (confirmed by CSC/ES), no penalty is incurred and keeping money will be pay. However, if the Contractor fails to successfully make the necessary repairs within the grace period, the Contractor will pay the cost for a third party to repair the damages (deduction from keeping money).

In case of IEMC/CSC/ES not detected of non-compliance with environmental regulations of the contractor, they will be responsibility payment to repair the violation.

5.3.7. Reporting mode

Require monitoring and reporting on the implementation ESMP is presented in Table 5.3.

Table 5. 2. Reporting requirements

	Report and reporting unit	Submit to	Frequency of reporting
1	Environmental management plan of construction contractor	Construction supervision consultant	1 times/4 week from the day sign the contract. Update when is adjusted
2	Reporting monthly for MXAS of Construction contractor	Supervision consultant	Monthly
3	Reporting monthly for MXAS of Construction supervision consultant	PPMU	Monthly
4	Community monitoring	PPMU	When there is a complaint
5	PPMU	CPMU	monthly

5.4. Capacity building, training

5.4.1. Capacity assessment

Project Management Unit 2 has experience in environmental and social management through 2 years of subproject implementation" Infrastructure for production transition in accordance with ecological conditions, improving livelihoods, adaptation to climate change in

Cu Lao Dung" (2016-2018). The leaders and staff of the PMU2 performed the World Bank requirements for environmental and social management, related procedures, roles and responsibilities of the stakeholders in implementation and monitoring ESMP. Through discussions with independent monitoring consultants, review the IMC reports, The environmental staff of PMU2 has been very active in working with the Bank's environmental specialists. PMU2 prepared the ESMP , presented the good content of the report, especially the mitigation measures in ESMP . During the preparation and implementation of subproject 7, PMU2 has professional staffs in environmental and social fields as follows:

Table 5. 3. professional staffs

No.	Name	Qualification	Capacity, experience, project participation	Training courses
1	Truong Hong Su	Construction engineer	Responsible for the environment and resettlement of the subproject "Building bridges on secondary canals in Quan Lo - Phung Hiep District, Soc Trang Province (48 bridges)" and the subproject "Prevention of salt intrusion for the production in left side of Saintard River, (WB6) ".	Social and environmental safeguard policy organized by CPO in Can Tho;
2	Le Thi Hue	Environmental engineer	Responsible for the environment and resettlement of the subproject "Building bridges on secondary canals in Quan Lo - Phung Hiep District, Soc Trang Province (48 bridges)" and the subproject "Prevention of salt intrusion for the production in left side of Saintard River, (WB6) ".	Social and environmental safeguard policy organized by CPO in Can Tho;
3	Nguyen Thai Hien	Construction engineer	Responsible for the environment and resettlement of the subproject "Building bridges on secondary canals in Quan Lo - Phung Hiep District, Soc Trang Province (48 bridges)" and the subproject "Prevention of salt intrusion for the production in left side of Saintard River,	Social and environmental safeguard policy organized by CPO in Can Tho;

No.	Name	Qualification	Capacity, experience, project participation	Training courses
			(WB6) ".	

During subproject 7, the capacity for environmental management of PMU2 will be strengthened further with technical assistance from the CSC, in particular the CS, and the training and consultancy provided by the IEMCs.

CSC will assist the PMU2 in reviewing the environmental aspects of the technical design, the bidding documents, the construction contract, the mitigation measures implemented during the construction phase, the risk and remedies as well as responses in emergencies to ensure compliance with ESMP.

On construction site, training in observation techniques to identify environmental issues at construction sites and disaster response plans will be provided by the IEMC. The staff of PMU2, including the engineers and implementation staff, will attend training courses conducted by the IEMC.

Therefore, when implementing sub-project 7, with the support of CSC, IEMC, the capacity of environmental staff, PMU staff on environmental and social security policy will be improved.

5.4.2. Training program to increase ability

Table 5.5 offer basic training programs on safety policy during the implementation of the subproject. This training program will be developed and implemented by the Technical Assistance Team for the implementation of safety policy measures. The PPMU / IEMC which will conduct training for contractors, CSCs and other groups, with the support of the Technical Assistance Team for implementation of protective measures. In addition, due to the limited capacity for implementing the safety policy of key project stakeholders, the bank will conduct training on ESMP preparation. and integrates cumulative impact assessments (CIAs) into ESMP as part of a safety policy capacity building program developed during implementation when identifying and agreeing on one of the activities training, capacity building. The Bank's consultants will conduct a five-day course on integrating the CIA into ESMP and how to solve the quality and the implementation of EIA in conjunction with other security tools. Details about the training program:

- Subjects trained: safety officer of PPMU, CSC, construction contractor.
- training progress: at least 1 month before commencement of construction. Training can be adjusted in accordance with the subproject/contract implementation schedule.
- Training frequency: 6 months / time. The frequency and content of the training will be re-evaluated during implementation. It is possible to predict training for PPMUs' safety

policy officers to be conducted during the first three years of the project.

Table 5.5. Capacity building program for environmental and social management and monitoring

Program 1	
Trainees	**PPMU**
Topic	Monitoring and reporting environmental issues
Participants	Technical staff and environmental staff
Training frequency	Immediately after the project becomes effective and at least one month prior to construction commencement.
Duration	2 times/year
Content	- General Environmental Management related to the subproject - Monitoring and reporting about environment in construction phase. - Control and risk response; - Safety policy form and payment method.
Responsibility	PPMU, IEMC with the support of sub-project's environmental consultant.
Program 2	
Trainees	**Environmental officer of construction supervisor consultant, contractors**
Topic	Environmental management plan of contractor Implementation of mitigation measures and implemenr report
Participants	CSC, construction managers at the site, Contractor's environmental officer
Training frequency	1 times after sign the contract and repeat 6month/time
Duration	2 times/year, 13 day/time
Responsibility	PPMU, IEMC with the support of sub-project's environmental consultant.

5.5. Cost Estimation

The estimated cost in implementing ESMP will include (i) the cost of land acquisition and resettlement, (ii) the costs of implementing mitigation measures by the contractor, (iii) expenses supervised by CSC, (iv) cost of the environmental management consultant (EMC), consist of environmental quality monitoring, (v) The cost for water/waste water quality monitoring after the first 2 years of operation, (vi) Cost of management and monitoring of PPMU and CPMU. Estimated cost for implementing ESMP will be summarized in Table 6.6 below.

- The Cost of implementation of mitigation measures during construction will be part of the constructure contract cost and the cost of CSC supervision is set in the construction supervision contract.

- The Cost for EMC and environmental quality monitoring during construction are included in the cost of the subproject.
- The cost for supporting and implementing the mitigate measure of enviromental and social impact of livelihood models will be integrated into the design and cost of each model.

Cost estimates for implementing the ESMP (excluding the cost of contractor's environmental protection measures and RAP implementation cost): VND 2.986.204.484. Details of the ESMP implementation budget are presented in Table 5.6.

Table 5.6 -Total estimated cost for implementing ESMP for subproject

Items	**Funding**	**Total amount (VNĐ)**
(a) Compensation and resettlement for affected households	As a part of sub-projects cost	
(b) The costs of implementing mitigation measures by the contractor	As a part of construction contracts values	Included in the construction contract value
(c) Safety supervision during construction (60 months x 10 million VND / month)	As a part of sub-projects cost	Included in scope of work and the construction consultant contract value
(d) (Environmental monitoring for the subproject (Table 6.6)	As a part of Environmental monitoring consultant values	788.619.072
(e) Environmental monitoring consultant (EMC)	As a part of sub-projects cost	2.986.204.484
Tổng cộng		2.986.204.484

Table 5.7. Total estimated cost for environmental quality monitoring of subproject

Content of monitoring	**Unit price (VND)**	**Situation**	**Total Quantity**	**Cost (VND)**
Surface water quality monitoring of the canals is constructed				**603.585.528**
pH	113.450	39	312	35.396.400
DO	109.950	39	312	34.304.400

TSS	164.680	39	312	51.380.160
COD	205.940	39	312	64.253.280
BOD_5	206.337	39	312	64.377.144
Oil	436.844	39	312	136.295.328
Turbidity	110.122	39	312	34.358.064
Cl^-	184.876	39	312	57.681.312
Coliform	402.370	39	312	125.539.440
Monitoring air quality				**12.673.304**
Turbidity	245.184	7	7	1.716.288
Noise	420.000	7	7	2.940.000
CO	447.246	7	7	3.130.722
SO_2	351.085	7	7	2.457.595
NO_x	346.957	7	7	2.428.699
Monitoring the quality of excavated soil				**162.760.240**
Cu	612.598	40	40	24.503.920
Fe	284.800	40	40	11.392.000
Cd	662.586	40	40	26.503.440
Cr	612.598	40	40	24.503.920
Pb	662.586	40	40	26.503.440
Zn	612.598	40	40	24.503.920
pH	321.240	40	40	12.849.600
Salinity	300.000	40	40	12.000.000
landslide monitoring				**9.600.000**
Observe along 2 sides of the canal	200.000	-	48	9.600.000
Total				**788.619.072**

Note: Details of prices are based on the Decision No. 10/2018/QD-UBND dated March 27, 2018 of the Soc Trang People's Committee on promulgating the regulations on unit prices for environmental monitoring and analysis activities: ambient air, noise and vibration, surface water, groundwater, rainwater, sea water, sewage and sediment in Soc Trang province.

5.6. Grievance Redress Mechanism (GRM)

Within the Vietnamese legal framework, citizen rights to complain are protected. As part of overall implementation of the project, a grievance redress mechanism (GRM) will be developed by the ESU of the PPMU, according procedures, responsible persons and contact

information will be developed. It will be readily accessible to ensure that grievances shall be handled and resolved at the lowest level as quickly as possible. The mechanism will provide a framework within which complaints about environmental and safety issues can be handled, grievances can be addressed and disputes can be settled promptly. The GRM will be in place before construction commencement.

During construction, the GRM will be managed by the contractors under supervision of the CSC. The contractors will inform the affected communities and communes about the GRM availability to handle complaints and concerns about the project. This will be done via the community consultation and information disclosure process under which the contractors will communicate with the affected communities and interested authorities on a regular basis. Meetings will be held at least quarterly, monthly information brochures will be published, announcements will be placed in local media, and notices of upcoming planned activities will be posted, etc.

All complaints and corresponding actions undertaken by the contractors will be recorded in project safeguard monitoring reports. Complaints and claims for damages could be lodged as follows:

- Verbally: direct to the CSC and/ or the contractors' safeguard staff or representatives at the site offices.
- In writing: by hand-delivering or posting a written complaint to specified addresses.
- By telephone, fax, e-mails: to the CSC, the contractors' safeguard staff or representatives.
- Upon receipt of a complaint, the CSC, the contractors' safeguard staff or representatives will register the complaint in a complaint file and maintain a log of events pertaining to it thereafter, until it is resolved. Immediately after receipt, four copies of the complaint will be prepared. The original will be kept in the file, one copy will be used by the contractor's safeguard staff, one copy will be forwarded to the CSC, and the fourth copy to the PPMU within 24 hours since receipt of the complaint.

Information to be recorded in the complaint log will consist of:

- The date and time of the complaint.
- The name, address and contact details of the complainant.
- A short description of the complaint.
- Actions taken to address the complaint, including contact persons and findings at each step in the complaint redress process.
- The dates and times when the complainant is contacted during the redress process.
- The final resolution of the complaint.

- The date, time and manner in which the complainant was informed thereof.
- The complainant's signature when resolution has been obtained.

Minor complaints will be dealt with within one week. Within two weeks (and weekly thereafter), a written reply will be delivered to the complainant (by hand, post, fax, e-mails) indicating the procedures taken and progress to date.

The main objective will be to resolve an issue as quickly as possible by the simplest means, involving as few people as possible, and at the lowest possible level. Only when an issue cannot be resolved at the simplest level and/ or within 15 days, will other authorities be involved. Such a situation may arise, for example, when damages are claimed, the to-be-paid amount cannot be resolved, or damage causes are determined.

The World Bank's Grievance Redress Mechanism: Communities and individuals who believe that they are adversely affected by a WB-financed project may submit complaints to the available project-level grievance redress mechanism or the WB's Grievance Redress Service (GRS). The GRS will ensure that complaints received are promptly reviewed to adddress project-related concerns. The affected communities and individuals of the project may submit their complaints to the WB's independent Inspection Panel that will determine whether harms occurred, or can occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at anytime after concerns have been brought directly to the WB's attention, and the Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit www.worldbank.org/grs. For information on how to submit complaints to the World Bank Inspecition Panel, please visit www.inspectionpanel.org.

CHAPTER 6: PUBLIC CONSULTATION AND DISCLOSURE

In the ESMP process, information disclosure and public consultation on environment ensures the acceptance of local authorities, local NGOs and local affected people in the subproject area. Public participation is one of basic conditions that ensure the local authority and community's support for subproject and take their view into account. Through public consultation, unidentified environmental adverse impacts and mitigation measures can be recognized and included in ESMP report. In fact, if community takes part early in the subproject preparation, the relationship between community and project officials becomes closer. Thereafter, the community can continue to contribute their feedback and any concerns they may have during subproject implementation.

6.1. Objectives of public consultation

The World Bank's policy (OP/BP 4.01) on environmental impact assessment requires that the Project Affected People (PAPs) and local authorities to be provided and consulted during the preparation of the ESMP report.

Public consultation (in the preparation of ESMP report for the subproject) must comply with the requirements in the Government's Decree No. 18/2015/ND-CP dated 14 February 2015 on environmental protection planning, strategic environmental ssessment, environmental impact assessment and environmental protection plan, and Circular No. 27/2015/TT-BTNMT dated 29 May 2015 of the Ministry of Natural Resources and Environment on strategic environmental assessment, environmental impact assessment and environmental protection plan, and the World Bank requirements.

Objectives of public consultation:

- The consultation with the participation of local authorities and local people in the subproject site during the preparation and implementation of ESMP and ESMP is to provide essential information for further understanding about the project, impacts of the subproject implementation and potential mitigation measures for the subproject;
- Clarify issues discussed in the beginning period of the subproject;
- Inform benefits achieved when the subproject is implemented;
- State responsibilities and awareness of stakeholders, beneficiary people in the subproject site during the subproject implementation;
- Encourage the community participation in determining the environmental impacts of the subproject.
- Collect information about demands as well as correspondences of local people and authorities in the construction and recommendation in order to mitigate environmental impacts or considering adjustment in the technical design stage.

6.2. Implementation methods

Technical consultants and environmental consultants collaborated closely with PPMU and conducted two public consutaltation with the local authorities and communities in the affected areas. The first consultation was conducted when the location of the landfill and canal sections dredged for supplying soil for the upgrading of provincial road 933B was determined, The second consultation was carried out when implementing ESMP .

About the first consultation, PPMU organized a consultation meeting with People's Committees of 4 communes, including An Thanh 1 commune, An Thanh 2 commune, An Thanh 3 commune, An Thanh Tay commune. Before the consultation, the meeting was held in Cu Lao Dung District, Soc Trang Province at 8:00 on July 31, 2017. Participants in these meetings include: representatives of investors, representatives Commune People's Committees, Design Consultant Representatives ...

For the second consultation, PPMU organized consultation in communes within the subproject area and the people affected by the subproject from July 17-20, 2017 to introduce the subproject, collect information on the current. local sanitation status, discussing potential environmental impacts caused by subproject implementation and reduction measures.

All the feedbacks and inputs from the consultation were taken into account and incorporated into the subproject design and the safeguard instruments of the subproject. Some pictures of the public consultation are presented in Annex.

6.3. Public consultation results

Generally, through the public consultations at the subproject area, the authorities and local people supported the subproject and desired the subproject to be implemented early. Some consultation opinions are summarized as follows:

6.3.1. The first consultation

An Thanh 1 commune, An Thanh 2 commune, An Thanh 3 commune, An Thanh Tay commune have commented on the canal sections to be dredged for soil for road embankment 933B and canal sections that are not dredged, presented details in meeting minutes on the determine the locations and sections of the canal next to road 933B can be dredged to get the soil for road embankment 933B and unify the Rach Trang Market avoid route (attached appendix).

6.3.2. The second consultation

The People's Committees of communes / towns in Cu Lao Dung district agree on the subproject's guidelines and agree with the corresponding contents presented in the draft ESMP , and have the following comments:

a. People's Committee of An Thanh 1 Commune

- When implementing the project will affect the ecological environment, socio-economic and residential areas, so the An Thanh 1 People's Committee agreed on the negative impacts of the project raised in the ESMP report.
- An Thanh 1 Commune People's Committee agrees with the corresponding contents presented in the ESMP report. Therefore, during project implementation, the project owner needs to implement environmental protection solutions as committed in ESMP.
- Hazardous wastes such as waste oil, which arise during construction, inspection and maintenance of machinery and equipment must be thoroughly collected and treated in accordance with regulations on hazardous waste treatment.
- Ensuring construction on schedule to not affect the local economy.
- Requiring transportation vehicles to be carefully covered when carrying materials, must not carry too full or over load.

a. People's Committee of An Thanh 2 Commune

- Project management staff, the workforce of contractors in the project implementation process must be registered temporary residence, coordinate with local authorities to ensure social security in the project implementation time.
- Arranging people to guide traffic when constructing through residential areas to avoid traffic accidents.
- Hazardous wastes such as waste oil, which arise during construction, inspection and maintenance of machinery and equipment must be thoroughly collected and treated in accordance with regulations on hazardous waste treatment.

b. People's Committee of An Thanh 3 Commune

- The construction process must not affect the regional voltage line.
- Construction must ensure that it does not hinder the circulation of people and traffic safety.
- Construction time is not stagnant, avoiding affecting people's lives as well as local environmental safety.

c. People's Committee of An Thanh Nam Commune

- Measures must be taken to ensure irrigation water for local agricultural production;
- No construction on the rest time of the people, specifically from 20 hours - 5 hours the next day;
- After completion of the project, it must be maintained regularly to ensure the quality of the project is operated for a long time.

d. People's Committee of An Thanh Dong Commune

- When implementing the project will affect the ecological environment, socio-economic and residential areas, so the An Thanh Dong People's Committee agreed on the negative impacts of the project raised in the ESMP report.
- An Thanh Dong Commune People's Committee agrees with the corresponding contents presented in the ESMP report.Therefore, during project implementation, the project owner needs to implement environmental protection solutions as committed in ESMP.

e. People's Committee of An Thanh Tay Commune

- Construction must ensure that it does not hinder the circulation of people and traffic safety

in the project area;

- Construction should not exceed the time limit as reported and avoid affecting the use of electricity and water in the project area.
- Construction units must use construction measures to minimize dust, noise, surface water pollution ... so as not to affect people's health.

f. People's Committee of Dai An 1 Commune

- Construction must not affect water sources and electricity for people's daily life;
- Construction must ensure that it does not hinder the circulation of people and traffic safety in the project area;
- The quality of works must ensure the water supply and drainage for production;
- The project manager, the workforce of contractors during the project implementation must be temporarily registered, at the same time, coordinate with local authorities to ensure social security in the project implementation period.

g. People's Committee of Cu Lao Dung Town

- Hazardous waste and solid waste must be collected and treated in accordance with current regulations.
- Reporting the progress of construction for People's Committee to arrange planting.
- Ensure safety during construction, take measures to prevent and fight fire.

An Thanh Dong commune, July 20, 2017

Dai An 1 commune, July 18, 2017

An Thanh Nam commune, July 18, 2017

An Thanh 1 commune, July 17, 2017

In addition, the project owner organized a meeting to collect opinions for community consultation. The consultation results are shown in the following table:

No.	Location	Time	Component	Community opinion
1	An Thanh 1 commune	15h July 17, 2017	- Vice Chairman of People's Committee: Mr. Vo Van Nup - Project owner representative: Mrs Ho Tu Thu Phuong - 10 households in An Thanh 1 commune	- Construction of sluices, bridges, small dams should ensure traffic safety, temporary road construction, avoid local flooding.
	An Thanh 2 commune	17h July 17, 2017	- Chairman of People's Committee: Mr. Nguyen Van Ve - Project owner representative: Mrs Ho Tu Thu Phuong - 10 households in An Thanh 2 commune	- Construction must arrange temporary roads to ensure circulation and transportation of agricultural products by local people. - Construction progress is not stagnant - Arranging location of sewer and bridge suitable
	An Thanh 3 commune	15h July 18, 2017	- Vice Chairman of People's Committee: Mr. Co Van Hai - Project owner representative: Mrs Le Thi Minh Chau - 10 households in An Thanh 3 commune	- Construction on schedule, not prolonged, affecting traffic. - Land transportation must be covered tightly, not spillage during transport. - Sluice construction schedule must inform the local people to have a reasonable plan for drainage during construction.
	An Thanh Nam commune	17h July 18, 2017	- Chairman of People's Committee: Mr. Tran Huu Phuong - Project owner representative: Mrs Le Thi Minh Chau - 10 households in An Thanh Nam commune	- Construction of the bridge must have a plan to make temporary bridges and ensure circulation for people. - Managing workers closely, avoiding disorder. - Construction time is not

No.	Location	Time	Component	Community opinion
				over 22h
	An Thanh Dong commune	8h July 20, 2017	- Chairman of People's Committee: Mr. Vo Quoc Han - Project owner representative: Mrs Ho Tu Thu Phuong - 19 households in An Thanh Dong commune	- Sluice must ensure aperture and location to the circulation and transport of sugarcane. - Construction schedule must inform the local people to actively arrange the season. - Location of sluice must be synchronous, avoiding local flooding.
	An Thanh Tay commune	8h July 18, 2017	- Chairman of People's Committee: Mrs Le Thi Hong Loan - Project owner representative: Mrs Le Thi Minh Chau - 10 households in An Thanh Tay commune	- Reporting the progress of construction for local people to arrange planting. - Upgrading of traffic routes must ensure safety for traffic participants. - Storage of materials does not hinder traffic.
	Dai An 1 commune	13h July 18, 2017	- Chairman of People's Committee: Mr. Tran Hoang Kha - Project owner representative: Mrs Ho Tu Thu Phuong - 10 households in Dai An 1 commune	- Exchange of environmental impacts of the project in the area. - Recommend project owner some additional work items to achieve effective project goals. - Paying attention to construction problems, installing appropriate culverts, not obstructing traffic
	Cu Lao Dung town	9h30 July 19, 2017	- Chairman of People's Committee: Mr. Nguyen Van Dong - Project owner representative: Mrs Ho Tu Thu Phuong - 10 households in Cu Lao Dung town	- Expanding the existing traffic route must ensure traffic safety measures.

The project owner received the opinions of the People's Committees of communes in the

project area and committed to well implement the following issues:

- The project owner gave a detailed assessment of the impacts of the project implementation and mitigation, prevention and response measures in this ESMP report.
- Project owners will prioritize the recruitment of local workers to address the work needs of them.
- The project owner commits to well implement the environmental protection work, effective control of impact agents, treatment of waste generated from the project. At the same time, to well implement technical management measures and measures to prevent oil spill incidents as well as forest fires, minimize negative impacts on the natural and socio-economic environment of local in this ESMP report.
- The project owner commits to strictly comply with the provisions of the Law on Environmental Protection 2014.
- The project owner commits to strictly comply with the Vietnamese Standards (TCVN) on the environment and the National Technical Regulations (QCVN) promulgated on the environment.
- The project owner commits to build a training program, to train employees to respond promptly to incidents and risks that may occur during the construction and operation of the project.
- The project owner commits to strictly implement the environmental protection measures and solutions proposed in the report.

6.3. Environmental information disclosure

Following requirements for disclosure of information of the Bank and the government, the PPMU has locally disclosed the draft Vietnamese version of the ESMP at the CPO office, the office of Soc Trang PPC and CPC of the subproject communes. The draft ESMP report (English version) will be disclosed at the World Bank InfoShop. The final ESMP will also be disclosed locally and at the InfoShop.

REFERENCE

1. ESIA report of subproject "*Control water resources to adapt with climate change in south Mang Thit, Tra Vinh and Vinh Long provinces***"**, 2017.
2. RAP report of subproject "Infrastructure for production transition in accordance with ecological conditions, improving livelihoods, adaptation to climate change in Dung island", 2019.
3. Can Tho University (2013). *Baseline study and assess the status of biodiversity in Vinh Long province and identify the priority issues of biodiversity conservation.*
4. EIA report of subproject: "Infrastructure for production transition in accordance with ecological conditions, improving livelihoods, adaptation to climate change in Dung island", 2017
5. Pham Ngoc Dang, 2003. Air environment. Science and Technology Publishing House, 2003.

Annex 1: Decision approving the Report on Environmental Impact Assessment

Annex 2 – Dredged Material Disposal Plan (DDMP)

During the detailed design process, the consultant will develop a dredging plan with the following main contents. Mitigation measures which the consultant proposed, will be included in the estimates and bidding documents

1. Location and volume of dredging

The project will dredge along existing canals toto get the soil for dikes embankment. The canal and river will be dredged to the design depth, the first, dredging in the water, then dredging up on the shore.

Results of analysis of sludge samples on canals and rivers show that heavy metal content are at acceptable levels.

2. Plan of temporary storage materials

Dredged materials which being dredged, will be temporarily stored before they can be used for embankment.

The characteristics of wet mud dredged from rivers and canals are of most concern. Detailed design consultants will determine the plan of mud's temporary storage (location, area, ground elevation, land use status, works around the temporary stockpile), calculate the volume of objects storage materials in each temporary storage yard, height of pile of dredged materials, layout of storage yards and cofferdam design, Leakage drainage plan ... and measures to minimize environmental impacts, monitoring plans in process of temporary storage of materials.

3. Plan of dredging materials management by contractor

- The contractor will have to make a specific dredging plan and submit it to the Supervisory Consultant for approval before proceeding. The dredging plan will state:
  - Scope of dredging, methods and implementation schedule;
  - People may be affected by dredging;
  - The volume of dredging, sampling and analyzing physio-chemical-biological properties of water and dredged sludge must be analyzed for indicators of pH, DO, TSS, BOD, salinity, etc.; Heavy metals include Hg, As, Cd, Cu, Pb and Cr, organic matter, grease.
  - The sequence of dredging , describes the process of mud's temporary storage, pollution management of materials during temporary storage and transport, pollution control and risks during temporary storage and transport;

- Vehicle of transporting materials from dredged areas to temporary storage yards and locations for dyke construction, proposing routes, vehicle and time of operation;
- The schedule is informed to the community, announcing the name and contact phone number of the contractor to serve when complaints.
- Assessment environmental, social impacts and risks of dredging process;
- Provide impact mitigation measures;
- Plan to handle at temporary storage area;
- Environmental monitoring plan.

4. Potential impacts of dredging and temporary storage of materials

When setting up DDMP, detailed design consultants and contractors need to pay attention to and evaluate specifically the potential environmental and social impacts and risks related to the dredging and temporary storage of materials, but not limited to by the following effects:

Main impact of dredging process:

- Increasing turbidity of water causes adverse impacts on aquatic life and water intake activities for different purposes;
- Damage, reduce trees and green space on both sides of the river;
- Obstructing, increasing risks of waterway traffic safety
- Risk of occupational safety for workers when working on water

Main impact of temporary storage activity:

- Smell from dredged material;
- Water leaking from wet mud causes local flooding or spill into cultivated land that damages crops;
- Risks about Safety for the community;
- Sedimentation, changing natural drainage routes
- Landslide the slopes around the temporary storage causing unsafe.

5. Measures to minimize the impact of dredging mud

In addition to the usual impact mitigation measures, the dredging plan must meet the following requirements:

- Notify the time of construction and detailed construction plan before the start of 01 month for people to actively arrange farming schedules and adaptive solutions.
- Observe the river turbidity during dredging and suspend dredging when the turbidity increases.
- Controlling water leaking from temporary storage areas, leading water to leak to the river and preventing it from flowing to planting area of longan, sugarcane or aquaculture ponds.

- Monitoring pH of leaked water, if it does not meet the standard, leaked water must be neutralized with lime and released into the environment when the pH is up to standard.
- Make a cofferdam of each section before dredging, Construction of embankments to limit the impact on water quality and aquatic life in rivers and canals;
- Minimizing the disturbance of the river bed to a minimum, regularly supervising the temporary storage of dredged materials to ensure no pollution to the surrounding environment, maintaining the trench to collect water leaked;
- Water leaked from dredged materials is flowed through trench into rivers and canals, not spread into the surrounding environment;
- Minimize the impact of dredging on waterway traffic, existing structures on the water surface and the stability of the works on the river banks, minimizing the impact on plants and trees green on the canal bank;
- The machinery used for dredging is only carried out at a slow rate in each defined period of time, have rest intervals to settle;
- Putting signs in dangerous places along the Dredged canal route both on the ground and the water surface, for example with underground flow, erosion or deep excavation;
- Provide full life jackets and force workers to use when working on water. Arrange supervisors during shifts to timely respond to drowning incidents.

Annex 3. Analysis, compare options of subproject

1. Assessing "without subproject" and "with subproject"

"Without subproject": when the subproject is not implemented, it means environmental and social issues will be present and even worse. Flooding will continue to occur, difficult traffic, the area will be affected by salinization and sea level rise, The farmer's income will continue to be limited due to the pollution of water quality in the canals, the diseases of the fisheries will continue to be uncontrolled ...,

"With subproject": The project will contribute to the construction of irrigation and transport infrastructure, connecting local traffic with the existing transport system to facilitate socio-economic development, especially marine economic development, tourism development and serving rescue when natural disasters occur in the area, in accordance with the socio-economic development planning, defence security.

Results of the analyses are shown in table 1.

Table 1**. Analysis of social and environmental issues under the "without subproject" and "with subproject" alternatives**

No.	Environmental and social issues	Alternatives	
		Without subproject	**With subproject**
1	**Environmental issues**		
1.1	Water quality	Poor water quality caused by discharge of contaminated freshwater from aquaculture.	Improved water quality through support to production model which have wastewater quality control.
1.3	Change in salinity content of water resources	Saltwater will intrude very far inland, making it difficult for for the local people to cultivate rice and fruit trees, especially in the dry season.	Salt water is controlled to agricultural production and aquaculture sustainable for subproject area.
1.4	Climate change adaptation	- The subproject is in the seawater covered locate, where is expected to be severely affected by salinization and flooding in the context of climate change - Awareness of local people about climate change is still low.	- Raising awareness of local people on climate change by establishing climate change adaptation group. - Take steps to convert production from sweet production model to saline - brackish, saline - brackish to saline, avoid conflict between salty and sweet economy, and

		- Current livelihoods are not sustainable in context of climate change and salinization	raising resilience to climate change
2	**Social Issues**		
2.1	Serving flood prevention in the area	The project area has low topographic, often flooded. Life and economy are unstable due to natural disasters	- Improving waterlogging through the upgrading and construction of 62,659 km of river dykes, sea dykes and provincial roads 933B; - Helping local people stabilize and invest in agriculture.
2.2	Increase income for the households in the beneficiary area of the subproject	Income of the aquaculture people may decrease due to low water quality and saline soil contamination in the areas of fruit tree plantings.	Income of the local people increase due to: - Water regulation for will help reduce losses for fruit tree areas due to salinity intrusion. - Faster transportation of goods and products through the bridges reduces transport time, retains freshness of the product and sell with high price - Mangrove-shrimp to be certified organically grown mangrove-shrimp will help increase of economic value of the product.
2.3	Supply freshwater for production, livelihoods, and domestic purposes	In fact, the subproject area is not enough water for agriculture due to salinization.	When the sea dykes and sluice is completed, it will control salinization, increase water supply ability for domestic and agriculture
2.4	Filling the current land transportation gap	Transport infrastructure system on the road 933B (9 bridges) is degraded, narrow in size, flooded due to low roadbed so doesn't meet transportation needs.	The project will facilitate transportation in the region to be developed.
2.5	Land acquisition and resettlement	No household will be affected by land acquisition and resettlement.	Permanently revoke **497.936** m^2 (1.410 household) Temporary revoke **63.146.m^2** (785 household)

2.6	Interruption of water traffic	None	Water traffic will be changed when some canal gates are blocked by dykes

2. Compare options

Table 2**Error! Reference source not found.** presents a comparison of structure options for sluice design. The result shows that: (i) For sluice structures, large embankment plan (option 1) have adverse social and environmental impact more than small embankment plan (option 2) (ii) For the type of structure, option 2 have environmental and social impacts lower than option 1. In fact, Option 2's negative impacts are negligible and can be mitigated, so Alternative 2 should be selected.

Table 2. Technical options are implemented in the subproject

No.	Categories	Alternatives	
		Large embankment plan	Small embankment plan
	Advantages	- Fully active in controlling flooding due to high tide and sea level rise. - Suitable for large production models. - Non-investment required in the embankment system along the canals (the current is traffic bridges). - It is possible to organize the operation of a sewer system for supply and drainage on a large scale.	- Less impact on water transport in the region, better water exchange. - Increase self-cleaning ability of water sources. - Continue to use the existing bridges, it is not necessary to build new sluices at the beginning of the canal, leading to a reduction in construction costs. - operation costs and annual maintenance costs of infrastructure on the dyke decrease. - Proactive in production organization, high level of safety in production. Proactive requirements for separated water supply and drainage (small scale) for coastal shrimp farming. - Minimize risks than Large embankment plan when dyke breakage or overflow occurs.
	Disadvantages	- Impact on waterway traffic (when culverts are closed to prevent high tide, boats cannot circulate).	- Small dikes along canals in areas which has traffic bridges at the beginning canal have to be constructed;

No.	Categories	Alternatives	
		Large embankment plan	Small embankment plan
		- Construction costs increase due to replacement of existing bridges with sewers. - The operation and maintenance of annual works is complicated and expensive, when the breakdown of dikes occurs, the safety in production is lower than Small embankment plan. - Surface water of the inner area of the embankment is affected if not properly operated.	- The current dikes are available, but every year, it is necessary to upgrade them. - Operation and maintenance is simpler than large embankment plan
	Impacts on social and environment issues	- Construction depends much on the weather, so it is difficult to control negative impacts - The social impact is increase due to the need of land to arrange construction sites, warehouses, temporary houses and land for concrete pouring - The longer the construction time, the longer the affected environment	- Less cause of environmental pollution in the construction area than the method of pouring concrete in place.
	Economical issue	Construction costs increase due to replacement of existing bridges with sewers.	operation costs and annual maintenance costs of infrastructure on the dyke decrease.
	Conclusion	*Not Selected*	***Selected***

3. Compare Expand and upgrade roads 14m option with Expand and upgrade roads 7m option.

Table 3. Compare Expand and upgrade roads 14m option with Expand and upgrade roads 7m option.

TT	Categories	Alternatives	
		Expand and upgrade roads 14m option	**Expand and upgrade roads 7m option**
1	Volume of excavated soil (m^3)	187.897	121.750

TT	Categories		Alternatives	
			Expand and upgrade roads 14m option	**Expand and upgrade roads 7m option**
2	Land clearance volume (ha)		51.03	56.109
3	The impacts	Land area to be recovered to expand, upgrade the roads	much => great influence on production, cultivation and trading activities of people.	few => little influence on production, cultivation and trading activities of people.
		Impact from excavation activities, generating dust and noise,...	much => great influence on local people	few => little influence on local people
		Construction time	Long => Long-term effects on people's traffic	short => short-term effects on people's traffic
		Impact of solid waste, waste water from the process of cleaning machines,...	much => great influence on the health of workers and surrounding people	few => little influence on the health of workers and surrounding people
		Security	High risk	Low risk
		Risks, incidents and labor accidents	High risk	Low risk
		Canal	Fill the canal => flooding, affecting the economy and people's daily life.	Do not fill the canal, little impact on the flow, life and living of the population
	Conclusion		*Not Selected*	***Selected***

4. Compare Plan to expand the straight line with avoidance route construction plan

Table 4. Compare Plan to expand the straight line with avoidance route construction plan

No.	Period	Alternatives	
		Plan to expand the straight line	**avoidance route construction plan**

No.	Period		Alternatives	
			Plan to expand the straight line	**avoidance route construction plan**
1	Contruction		- Land area to be recovered to expand, upgrade the roads isn't much (about 1m each side of the road). - Reducing the impact from earthworking. - Shorten construction time. - The construction activities generate dust, noise, vibration, ... affecting residential areas. - Saving the cost to hiring workers in digging and embankment activities.	- Land acquisition, loss of cultivated land of people; - Longer construction time, must carry out the recovery and compensation for the people; - Spending a lot of money in the construction phase (compensation, bridge construction, hiring many workers, ...); - The construction activities generate waste, little impact on the people.
2	Operation	Positive	- Increase trading activities on both sides of the road.	- Decrease trading activities on both sides of the road. - Limit traffic congestion. - Waste generated during operation, has little impact on people. - Avoid traffic congestion at the entrance of residential areas.
		Negative	- Increased risk of traffic accidents - Traffic congestion at residential areas. - Affect the quality of residential life (noise, vibration, dust generated, ...).	- Loss of cultivated land, affecting economic production activities of people.
Conclusion			*Not Selected*	***Selected***

Annex 4: Results of environmental quality analysis

Annex 5: Minutes of public consultation

Annex 6: Sampling map about the environmental status of the background