

Initial Environmental Examination

September 2020

Viet Nam: Climate Resilient Inclusive Infrastructure
for Ethnic Minorities Project I

Upgrade Provincial Road No. 637, Vinh Quang, Vinh
Thanh Town Vinh Thanh District, Binh Dinh Province

CURRENCY EQUIVALENTS

(As of 2 September 2020)

Currency Unit	–	dong (D)
D1.00	=	\$ 0.00004
\$1.00	=	D 23,166

ABBREVIATIONS

ADB	Asian Development Bank
AADT	Annual Average Daily Traffic
AH	Affected Household
AP	Affected Person
CEMP	Construction Environmental Management Plan
CHSP	Community Health and Safety Plan
COVID-19	Corona Virus – 19 Pandemic
CRIEM	Climate Resilient Infrastructure for Ethnic Minorities
CRVA	Climate Risk and Vulnerability Assessment
CSC	Construction Supervision Consultant
DARD	Department of Agriculture and Rural Development
DDE	Detailed Design Engineer
DONRE	Departments of Natural Resources and Environment
DOT	Department of Transport
DPC	District Peoples Committee
DRC	District Resettlement Committee
EA	Executing Agency
EARF	Environmental Assessment and Review Framework
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EM	Ethnic Minorities
EMCs	Ethnic Minority Communities
EMP	Environmental Management Plan
EMS	Environmental Monitoring Station
ERP	Emergency Response Plan
ESCP	Erosion and Sedimentation Control Plan
ESO	Environmental Safeguards Officer
ESS	Environmental Safeguards Specialist
FS	Feasibility Study
FY	Fiscal Year
GDP	Gross Domestic Product
GoV	Government of Viet Nam
GRM	Grievance Redress Mechanism
HH	Household
IA	Implementing Agency
IEE	Initial Environmental Examination
IOL	Inventory of Loss
LEP	Law of Environmental Protection
LIC	Loan Implementation Consultant
MoNRE	Ministry of Natural Resources and Environment

PCR	Physical Cultural Resources
PCU	Passenger Car Unit
PPC	Provincial Peoples Committee
PPE	Personnel Protective Equipment
PPMU	Professional Project Management Unit
PR	Provincial Road
REA	Rapid Environmental Appraisal
SCCP	South Central Coastal Provinces
SPS	Safeguard Policy Statement, ADB
TRTA	Transactional Technical Assistance
TCP	Traffic Control Plan
TSP	Total Suspended Particulates
UXO	Unexploded ordinance
WHO	World Health Organization

WEIGHTS AND MEASURES

BOD ₅	Biochemical Oxygen Demand
CaCO ₃	Calcium Carbonate
cm	Centimeter
COD	Chemical Oxygen Demand
dB(A)	A weighted sound pressure level in decibels
DO	Dissolved Oxygen
ha	Hectare
kg	Kilogram
km	Kilometer
Leq	Equivalent Continuous Noise Level
m	Meter
m/s	Meters per Second
m ²	Square Meters
m ³	Cubic Meters
mg/l	Milligrams per Liter
mm	Millimeter
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
°C	Degrees Celsius
pH	A measure of the acidity or alkalinity of a solution
PM	Particulate Matter
PM ₁₀	Particulate Matter smaller than 10 micrometers
SO ₂	Sulfur Dioxide
TSP	Total Suspended Particulates

NOTES

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

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EXECUTIVE SUMMARY

1. The Climate Resilient Infrastructure for Ethnic Minorities -1: Sector Project for Binh Dinh and Quang Nam Provinces (CRIEM-1) will support the acceleration of inclusive socioeconomic development of Quang Nam and Binh Dinh provinces. The project is aligned with the National Target Program on New Rural Development for 2016-2020 and the Master Plan on Socioeconomic Development of Central Coastal Provinces through 2020.
2. The project investment targets districts with the highest proportion of ethnic minorities (EM) beneficiaries. These mostly remote western districts have very low population density meaning that most local inhabitants face extended travel times to access services and markets compared with high density areas where schools and health clinics are able to be provided closer. The impact of the project will be increased economic opportunities and service delivery for EM communities with the Project outcome being service delivery and economic opportunities in Binh Dinh and Quang Nam Provinces.
3. The Government of Viet Nam (GOV) and Binh Dinh Provincial People's Committee are seeking financing from ADB for the construction of four road subprojects¹ and 2 water supply subprojects, of which a representative subproject is proposed and titled Upgrade Provincial Road No.637 Vinh Quang – Vinh Thanh Town, Vinh Thanh District, Binh Dinh Province in the center of Viet Nam. The Binh Dinh Provincial People's Committee is the Executing Agency (EA) and the Binh Dinh Provincial Project Management Unit of Construction Investment Works for Agriculture Rural Development (PPMU) is the Implementing Agency (IA) responsible for the implementation of the Project.
4. As project owner, each Provincial People's Committee (PPC) will be the Project Owner (Government Terminology) with the authority and jurisdiction to assign project management responsibility to the Binh Dinh Construction Investment Works Project Management Unit for Agriculture and Rural Development (PPMU). In ADB terms, each PPC is an Executing Agency (EA) and the delegated PPMU is the Implementing Agency (IA). The ADB preparation of Climate Resilient Infrastructure for Ethnic Minorities -1: sector project for Binh Dinh and Quang Nam Provinces (CRIEM-1) uses a sector-project approach where two representative sub-projects are used to test the feasibility of the overall investment each output along with project due diligence undertaken by ADB transaction technical assistance.
5. Under CRIEM the Government of Viet Nam (GOV) and Binh Dinh Provincial People's Committee (PPC) are seeking financing from ADB for construction of six subprojects – four in output 1, and 2 in output two. Within output 1 the EA proposes to upgrade a 2.4km section of Provincial Road (PR637)² located in Vinh Thanh District, Binh Dinh Province, South Central Viet Nam is prioritized, and it is being used as a representative subproject for output 1.
6. The subproject covered in this initial environmental examination (IEE) involves upgrading of a 2.4km section of Provincial Road 637 (PR637) from the Ta Suc Industrial zone in the south, adjacent to Vinh Quang Commune to Vinh Thanh Town, Binh Dinh Province. The existing category VI road includes three bridges along the road section. The section of the road has a history of flooding with several events each wet season lasting for up to 5 to 7 days during which the road is impassable. It is proposed to upgrade the road to category IV and with the

¹ An IEE has been prepared for a representative road subproject in addition to this subproject.

² A separate subproject will upgrade another section of PR637 approximately 20km north of Ahn Lao.

three bridges being replaced with two bridges of category 3.³ The proposal retains the existing road centerline with modifications to horizontal and vertical profiles, road widening, raising of embankments, improved drainage facilities and bridge re-construction.

7. The road and bridge designs adopt technical specifications that support projected traffic demand for the economic life of the road. Both the road and bridge design specifications provide resilience for climate change scenarios built on the Representative Concentration Pathway (RCP) 8.5 projections to ensure that the elevation of the road segment and the bridge will exceed flood levels at P4 (probability of the highest flood occurring in 25-year period) and P1 (probability of the highest flood occurring in 100-year period) events.⁴

8. Subproject screening undertaken by the TRTA team during April 2019 recommended this subproject as Category B for environment pursuant to ADB's Safeguard Policy (SPS 2009). Classification of Category B was confirmed based on material from data collected during site visits conducted by ADB and domestic and international environmental consultants, social safeguard consultants and consultations with affected persons and key stakeholders, and following completion of a Rapid Environmental Appraisal (REA) checklist for the subproject which is presented in Appendix A. The subproject is classified by ADB as Category B and it is required to prepare an IEE for fulfillment of ADB Safeguard Policy Statement (SPS 2009).

9. The IEE report reviews the anticipated environmental impacts associated with the Vinh Thanh PR 637 road section subproject and is used to develop an Environmental Management Plan (EMP) to ensure the environmental risks of the project are mitigated and or managed effectively. The EMP includes the need to mitigate and manage the risks of COVID-19. The contractor will be required to prepare and implement a COVID-19 Prevention and Management Plan.

10. The subproject is located in the mountainous district of Vinh Thanh with average altitude of 700m above sea level. The area is subject to the circulation of monsoonal winds and influenced by the Truong Son range with hot and humid tropical weather and short rainy season, last from October to December but concentrating 70-80% of the annual rainfall. In the subproject area, there were two historically heavy storms and subsequent long floods in 1984 and 2013. During the flood in 2013, the water levels were about 1.2m higher than the existing bridge elevation, and inundation lasted between 5-7 days. The subproject route is running through modified agricultural landscape and crosses two main waterways: Ta Suc and Xem Streams. The nearest legally protected site is Kon Ka Kinh National Park – nearly 40km to the Northwest of the subproject. There are few sensitive sites along the road alignment. Vinh Thanh Town Primary School is located on the left of the road, near the end point of the road section supported under the subproject.

11. The main anticipated adverse environmental impacts are related to the clearing of land, construction activities and the operation of the upgraded road. By nature, the subproject will

3 Based on the TRTA Vinh Thanh Road FS (July 2019), on the road there are three old bridges, including (i) Ta Suc I Bridge Km11+553.31 is a bridge with RC T-girder opening L=1x9m (10m) long, bridge width B=6.5m; (ii) Ta Suc II bridge Km11+700 is a bridge with RC plate girder (type of box culvert with big aperture), aperture L=2x8m (17.5m) long.

4 The pathways describe different climate futures, all of which are considered possible depending on the volume of greenhouse gases (GHG) emitted in the future. The RCPs – originally RCP2.6, RCP4.5, RCP6, and RCP8.5 – are labelled after a possible range of radiative forcing values in the year 2100 (2.6, 4.5, 6, and 8.5 W/m², respectively).

induce short-term and localized impacts during construction phase, and are associated with soil erosion, construction noise, dust, wastewater, solid and hazardous waste, disruption of traffic and community services, risks to worker health and safety, and the risk of UXO. Construction impacts are concentrated along the proposed road section and involve both Vinh Quang Commune and part of Vinh Thanh Town.

12. The project is assessed to be a low risk for COVID-19 impacts based on the COVID-19 management within Viet Nam that has seen very few infected individuals since March 2020. Risk management will focus on securing this situation at work sites through adopting preventative measures that limit the risk of transmission into subproject work sites or the adjacent communities. Preparation and implementation of plans for standard occupational measures for construction sites will minimize risks to worker health or safety; COVID-19 mitigation measures and actions will also be required.

13. The project's impacts to environment during project implementation (in three phases: preparation, construction and operation) have been recognized, and are as following:

14. During the pre-construction phase, the main impact associated with the project will occur from the clearing 3.6 ha of annual crop land (cultivated areas of corns, sugarcanes and sesames with some areas of acacia and eucalyptus) for the road widening and bridge construction. No houses are within the Right of Way (RoW) while associated assets such as fences and telegraph poles are. Prior to any construction contractor mobilization, all payments for land compensation will be completed as detailed in the REMDP. No land classifying as critical or natural habitat will be acquired.

15. In the design and preconstruction phases, the potential issues that were identified are (i) disturbance of UXO; (ii) land acquisition and resettlement; (iii) site clearance, earthwork, solid waste transportation; (iv) establishment of worker camping site. To minimize the first impact, the PPMU will coordinate with appropriate agencies to identify any UXO left and engage an authorized UXO clearing contractor. This work should be done in accordance with Law No. 14/2017/QH14 of the Viet Nam Government on management and use of weapons, explosives and combat gears. Identification of worker camping site, main work areas, domestic waste storage site(s) and solid waste transportation are the main works in the preparation phase of the project.

16. The expected social safeguard impacts have been assessed with an anticipated 71 households and 2 organizations and 5 enterprises being affected, of which 10 households are assessed as being severely affected. The social safeguard categorization is confirmed as category B as per the ADB SPS. The IP categorization is category B as the subproject will bring major positive impacts to the EMCs.⁵ No ethnic minority households will be negatively affected by the subproject implementation. To fully compensate affected households and minimize the impact on income and disturbance of local people's lives, the PPMU will ensure that the provisions of the subproject REMDP are fully complied with and that all compensation is fully settled prior to the issuance of a notice to proceed for the works contractor.

17. Construction impacts are concentrated along the road and at bridge sites. To adapt with the flooding to follow (RCP) 8.58 scenario, the elevation of some road sections and the two

⁵ See CRIEM REMDP for Vinh Thanh Road Subproject Report for details.

new bridges must be heightened that requires filling soil of about 227,244 m³.⁶ Careless construction and poor handling of these large amount of materials at two bridge construction sites might cause significant impacts such as release of silt to the Ta Suc and Xem streams, leading to reduce water quality and impact on cropped areas downstream. Poor management of the filling soil could also lead to erosion and blockage of the water flows at two streams, especially at the bridge construction site over the Xem stream (a tributary of Con River), where floods usually occur. The construction transport will also increase local air pollution and impact on local traffic and will temporarily increase the risk of traffic accidents, especially the pupils and teachers of Vinh Thanh Town Primary School as well as people of Ta Suc Industrial Cluster, both located along the subproject road.

18. Other typical construction impacts such as noise, dust, vibration, emissions, reduced water quality, waste generation, and other social impacts from the operation of construction machines and other activities are expected. No natural forests, protected areas or cultural or heritage object are encroached upon by the road widening.

19. To minimize the impact of earthworks, excavated soil should be reused as filling material as much as possible. Silt fences, consisting of fine, flexible mesh firmly secure to the ground will be used as appropriate at the excavation sites for bridge abutments construction, especially on Xem stream banks to prevent silt release into these streams. Fine material stockpiles should be covered with tarpaulin and located at least 50m from the stream bank.

20. The predominance of impact during the construction phase requires the PPMU to incorporate the mitigation measures detailed in the EMP within the works contract where the contractor will be required to prepare a construction EMP (CEMP) that responds in full to the EMP in this IEE. Given the large volume of earthworks, the preparation of an Erosion and Sedimentation Control Plan (ESCP), detailing the earthwork management and soil erosion control, is required and must be integrated in CEMP which will be reviewed and approved by PPMU before the construction starts.

21. Specific measures for siting of construction camps, the management of waste streams from construction works and construction camps, wastewater and hazardous materials management, will all be included in the CEMP. Operational programs to address with local issues relating to noise, dust or air pollutants will be addressed according to the conditions during the construction phase. Occupational safety will be included in the CEMP with respect to health (Noise, dust and air pollution) and safety with emphasis on road safety measures during construction.

22. Similarly, measures to protect community health and safety will be applied, including COVID-19 health risk management measures following internationally recognized Health and Safety guidelines, including the World Health Organization (WHO) Guidelines for COVID-19 measures and monitoring and the Government of Viet Nam regulations as updated through the life of the Project.

23. Impacts during the operation of the upgraded road include the increased risk of road accidents due to higher speeds along the road section to Vinh Thanh town. Higher vehicle speed will also increase noise and dust along the subproject route, especially at Vinh Thanh

⁶ The PR637 FS details K-95 road base earth is 198,604 m³; K-98 earthworks of 11,255 m³, all other earthworks of 11,435 m³.

Town Primary School, located near the end point of the subproject. Road humps and speed limit sign boards will be installed on the subproject route at high risk sites, especially at the school and Ta Suc Industrial Cluster sections to limit the speed of vehicles and minimize the impact of noise and dust pollution. Road safety during operation will be addressed in the detailed engineering design measures and through education and awareness raising for road users and local residents.

24. The contractor with the support from LIC, will prepare the Construction EMP based on the EMP included in this IEE which will be cleared by PPMU, prior to initiation of works. The CEMP is to incorporate mitigation measures undertaken during construction, including measures to address impacts of construction camp, sourcing of materials, disposal of wastes, and worker and community health and safety – including COVID-19 safety and health risk management plan. The CEMP will be updated should the COVID-19 status, or WHO/Government guidelines for COVID-19 management or reporting be revised. A construction supervision consultant (CSC) contracted by the PPMU, supported by a Loan Implementation Consultant (LIC), shall supervise day to day compliance of the contractor performance including the CEMP implementation. The cost of the EMP is estimated at about US\$11,900, excluding construction mitigation costs which are integrated in construction contract costs.

25. Community consultation meetings with participants from local authorities and residents were held by the PPMU and TRTA consultant from 25-26 April 2019 in the offices of Vinh Thanh Commune, Vinh Quang Town and Vinh Thanh District, to discuss the Vinh Thanh Construction activities and their impacts. Follow-on interviews with the affected people were also conducted during social survey. The project received strong support from the local authorities and communities. The concerned issues, mostly related to traffic safety, quality of construction work, the sufficient elevation of Xem bridges during the flood period and the adequate compensation process, have been adequately responded by the Consultant and PPMU and addressed in this IEE. The results of the public consultation are in Table 15.

26. The ADB AWARE assessment classifies the project area as facing high climate risk. A climate risk assessment (CRA) has been prepared that highlights the climate change impact on the expected flood levels (Q_{max}) under climate change scenarios. The subproject design includes an assessment of the historical Q_{max} data for the Con river and Xem stream (a tributary of Con River) confluence based on (i) local reporting, and (ii) the hydromet records from the Dinh Binh reservoir. The Xem stream catchment has been modelled for estimation of Q_{max} based on the historical rainfall records. Estimates of Q_{max} for exceedance frequency of P1 (1 in 100 years) and P4 (1 in 25 years) reflecting the required design standards for the Xem stream bridge (P1) and a Category IV road (P4). Climate change scenarios have been developed based on daily maximum rainfall projections using a suite of regional models and then extreme analysis framework developed in Viet Nam under TRTA7879 and reported in ADB (2018).

27. The climate change adjusted Q_{max} figures were used by the road and bridge design team with incremental changes to bill of quantities and the increased cost estimates prepared. The use of a P4 Q_{max} input for the road section reflects the shorter economic life of the road which will require upgrading within 20 years enabling an incremental response to increasing levels of Q_{max} projections. Climate change adaptation costs amount to 1.6 to 2.0% of capital investment and have been integrated into the preliminary designs in terms of road and bridge elevations, drainage apertures and supporting structural specifications.

28. Binh Dinh PPC as Executing Agency has delegated the implementation responsibility to the PPMU to implement the subproject in all phases. The PPMU will assign one staff member as the Environmental Safeguards Officer (ESO). An Environmental Safeguards Specialist (ESS) is included within the LIC team. The LIC will organize a formal training course in roles and responsibilities for EMP implementation and on-the-job training for relevant PPMU staff, the CSC, communities, contractors; and support for establishment and operation of the subproject environment management system in construction phase.

29. The IEE concludes that the socio-economic benefits of the proposed project far outweigh the anticipated adverse impacts. Assuming the anticipated adverse environmental impacts during construction and operation of the upgraded DR 637 road section are addressed according to the EMP with impacts reduced to acceptable levels, there is no significant environmental concern. As such, a full EIA is not necessary, and the subproject is categorized as category B under ADB SPS policy.

30. The anticipated impacts can be mitigated to acceptable levels through implementation of mitigation measures specified in the EMP integrated in this IEE (Section X). Local communities will be encouraged to seek work on the project and a mechanism has been introduced into the EMP to advise the local communities of possible opportunities by a series of planned awareness meetings.

31. Providing that significant changes to the subproject description do not occur at the detailed design phase, and that new sensitive environmental, or cultural resources are not encountered, further detailed environmental impact assessment (EIA) is not required. The ESS of the LIC, on behalf of the PPMU, will update the IEE and EMP upon finalization of detailed design.

32. To ensure that environmental protection and mitigation measures are included in the civil works contracts, the EMP will be incorporated into bidding documents and civil works contracts. Bid documents will also specify that contractors shall engage capable and trained staff to take responsibility for the environmental management and safety issues at the working level and to monitor the effectiveness and review mitigation measures as the subproject proceeds.

I. INTRODUCTION

1. The Climate Resilient Infrastructure for Ethnic Minorities – 1: Sector Project (CRIEM 1) will support the acceleration of inclusive socioeconomic development of Binh Dinh and Quang Nam Provinces of Viet Nam. The project is aligned with the National Target Program on New Rural Development for 2016-2020 and the Master Plan on Socioeconomic Development of Central Coastal Provinces through 2020.
2. The project investment targets districts with the highest proportion of ethnic minorities (EM) beneficiaries. These mostly remote western districts have very low population density meaning that most local inhabitants face extended travel times to access services and markets compared with high density areas where schools and health clinics are able to be provided closer. The impact of the project will be increased economic opportunities and service delivery for EM communities with the Project outcome being service delivery and economic opportunities in the CCPs increased.
3. Economic inclusiveness in the project area is constrained by low quality and fragmented basic infrastructure resulting in growing inequity as well as decreasing competitiveness and business investment, and increasing exposure to natural disasters, resulting in livelihood vulnerabilities and high costs for repair, reconstruction, and adaptation. The provincially managed, multisector project will promote inclusive economic growth for ethnic minorities in Binh Dinh Province (BDP) and Quang Nam Province (QNP) located along the southern-central coast. The two provinces encompass 16,635 square kilometers,¹ with a 2017 population of 3.1 million, of which 6% belong to ethnic minority communities (EMCs) that are mostly concentrated in 9 of the 29 districts within the two provinces where they constitute an average of 45% of the population.²
4. The project seeks to reduce poverty and inequity through improved economic inclusion, social access and connectivity to services, increased resilience of infrastructure and access to drinking water under the projected extremes of climate change in the 9 districts. The project will directly benefit about 0.34 million people through the implementation of locally prioritized subprojects, including (i) upgrading provincial, district and rural roads; (ii) improving water resource infrastructure such as (a) rural domestic water supply (RDWS), (b) irrigation, and (c) flood protection, (d) support for cultural tourism, and (iii) improving weather related risk management through climate and meteorological data systems.³
5. The project financing and execution will be devolved to the provincial administration through a range of on-lending arrangements based on the assessed financial strength of each Province under the provision of Decree No. 97/2017/ND-CP (June 30, 2018). The Ministry of Finance (17 December 2018) has indicated that: (i) on-lending of 70% of loan amount (\$29 million) or \$20.3 million will be lent at cost to the Province of Quang Nam with 50% or \$14.5 million for Binh Dinh Province.⁴
6. As project owner, each PPC will be the Project Owner (Government Terminology) with

¹ Nearly 5% of total land area of Viet Nam.

² The project districts in BDP are An Lao, Hoai Nhon, Van Canh, Vinh Thanh, and in QNP are Bac Tra My, Nam Tra My, Nam Giang, Phuc Son and Tay Giang.

³ ADB. 2018. High Level Technology Fund. Manila.

⁴ This is subject to review under ongoing policy reform relating to the use of ODA financing.

the authority and jurisdiction to assign project management responsibility to a Provincial Project Management Unit (PPMU). In ADB terms, each PPC is an Executing Agency (EA) and the delegated PPMU is the Implementing Agency (IA).

7. The project is aligned with the following expected impact: inclusive socioeconomic development of the selected provinces accelerated.⁵ To contribute to this impact statement, the project proposes to achieve the following outcome: social and economic status and inclusiveness of ethnic minorities communities improved. The project outcome will be achieved through the following outputs:

8. **Output 1: Transport infrastructure improved.** The project will upgrade seven district and commune roads totaling about 121.8 kilometers (km), which will improve connectivity and mobility of EMCs within the seven districts with a total population of 206,700 of which an average of 48% belong to EMCs. The climate-resilient transport links will integrate remote rural production into market chains and processing facilities. Freight movement of acacia and high value crops will be improved. The effort of EMCs to dependably reach essential services including health, education, and markets will be reduced. The overall transport network will be much more efficient, reducing travel time for road users and especially improving access to health, education, and market services especially for women who already suffer from time poverty.

9. **Output 2: Water resource infrastructure improved.** This output will construct, upgrade, rehabilitate, or stabilize: (i) RDWSs to provide water to approximately 18,600 people through 115 km of piped networks; (ii) an existing reservoir to support 117 hectares of irrigation command area with more reliable and efficient water supply; and (iii) cultural tourism infrastructure including one river defense - 3.6 km of embankment, visitor car parking and solid waste collection in district's communities with a total population of 17,700 of which 94% are from EMCs. Activities under this output will benefit about 36,300 people and improve communities' health by reducing the risk of water borne diseases and will particularly benefit women by reducing their time for water collection.

10. **Output 3: Data systems for climate risk management updated.** This output will provide improved access to reliable weather and climate data, in a timely and cost-effective manner. These data will inform a wide range of decisions including design of climate resilient infrastructure, strengthened early warning systems, and improved disaster response.⁶ High level online technology will be employed to improve the capacity of the provincial government, to manage, collect, archive, and share existing data through client interfaces.

11. The ADB preparation of Climate Resilient Infrastructure for Ethnic Minorities -1: (CRIEM 1) project uses a sector-project approach where a selected representative subproject within each output are used to establish feasibility of proposed investments along with project due

⁵ Prime Minister. 2011. *Decision No. 1600/QĐ-TTg Issuing the List of the National Target Programs—Phase 2016–2020*. Hanoi; Prime Minister. 2013. *Decision No.2622/2013/QĐ-TTg dated 31 December 2013 approving the socio-economic development master plan of Quang Nam province through 2020, with vision to 2030*. Ha Noi; Prime Minister. 2009. *Decision No. 54/2009/QĐ-TTg dated 14 April 2009 approving the socio-economic development master pan of Binh Dinh province through 2020*. Ha Noi.

⁶ The extent and type of investment vary significantly between the two provinces, reflecting the ongoing investments into Quang Nam Province financed by the World Bank through the Dam Rehabilitation and Safety Project and ADB through the Developing and Implementation of Flood Forecasting and Warning System for Hoi An and Vu Gia-Thu Bon River Basin contract, Urban Environment and Climate Change Adaptation Project.

diligence undertaken by ADB transaction technical assistance.

12. Under CRIEM-1 the Government of Viet Nam (GOV) and Binh Dinh Provincial People's Committee (PPC) are seeking financing from ADB for construction of seven subprojects – four in output 1, and 3 in output two. Within output 1, Provincial Road (PR637) located in Vinh Thanh District, Binh Dinh Province, South Central Viet Nam is prioritized with the TRTA and PPC agreeing to use this as a representative subproject for output 1.

13. **Provincial Road 637.** The subproject covered in this IEE involves upgrading of a 2.4 km section of Provincial Road 637 (PR637) from the Ta Suc Industrial zone in the south, adjacent to Vinh Quang Commune to Vinh Thanh Town, Binh Dinh Province in the north. The existing category VI road includes three bridges along the road section. The section of road has a history of flooding with several events during each wet season lasting for up to 5 to 7 days during which the road is impassable. The road upgrading to category IV and for category 3 bridges will follow the existing road centerline with modifications to horizontal and vertical profiles, road widening, raising of embankments, improved drainage facilities and bridge reconstruction. The road and bridges designs adopt technical specifications that support current and future traffic demand through the economic life of the road. Both the road and bridge design specifications provide resilience for climate change scenarios built on the RCP 8.5 projections to ensure the elevation of the road segment and the bridge will exceed flood levels at P4 and P1 events.

14. Subproject screening undertaken by the TRTA team during April 2019 initially confirmed this subproject as Category B for environment pursuant to ADB's Safeguard Policy (SPS 2009). Classification of Category B was confirmed following completion of a Rapid Environmental Appraisal (REA) checklist for the subproject which is presented in Appendix A. A category B project is expected to have potential adverse impacts that are site-specific, largely reversible, and can be readily addressed through mitigation measures.

15. The objectives and scope of this IEE are: (i) to assess current environmental conditions in the project area; (ii) identify and assess the potential environmental impacts of the upgrading works including their magnitude and significance; (iii) identify mitigation measures to avoid or reduce impacts to acceptable levels; and (iv) prepare an EMP describing mitigation measures, monitoring, reporting requirements, agency responsibilities, and cost estimates.

16. This IEE was prepared for the Vinh Thanh Road (PR637) Subproject during the feasibility design stage using available data and information on sensitive socio-economic, physical and biological resources that exist for the project site.

17. For the requirements of National Decree 40/2019/ND-CP, an Environmental Impact Assessment is required for all projects, either Environmental Impact Assessment Report (EIA) or Environmental Protection Plan (EPP). This subproject is subject to EPP which will be prepared by the PPMU and submitted to Department of Natural Resources and Environment (DONRE)/District Provincial Committee (DPC) for appraisal following project approval based on the final detailed engineering design. The IEE and EMP that has been prepared for the subproject will be reviewed and updated, as needed, by the PPMU based on changes or new information identified during the detailed engineering design.

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. Viet Nam Regulatory Framework for Environmental Assessment

18. Law on Environmental Protection (No.55/2014/QH13) dated June 23, 2014 and Decree on Environmental Protection Planning, Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Plans (No. 18/2015/ND-CP) dated February 14, 2015 are the key legal frameworks for environmental management in Viet Nam. The Law on Environmental Protection (LEP) provides statutory provisions on environmental protection activities; measures and resources used for the purpose of environmental protection; rights, powers, duties and obligations of regulatory bodies, agencies, organizations, households and individuals who are tasked with the environmental protection task. The LEP is applicable to regulatory bodies, public agencies, organizations, family households and individuals within the territory of the Socialist Republic of Viet Nam, including mainland, islands, territorial waters and airspace. LEP is on regulating strategic environmental assessment, environmental impact assessment and environmental protection commitment.

19. The law requires consultation on, inspection and approval of the planning for environmental protection (Article 11, chapter II) as well as the list of entities subject to strategic environmental assessment in appendix I and II of the Decree No. 18/2015/ND-CP dated February 14, 2015 of the Government.

20. The LEP has been elaborated for enforcement with several guiding Decrees and Circulars. Decree No.18/2015/ND-CP dated February 14, 2015 and most recently, Decree No. 40/2019/ND-CP dated May 13, 2019 of the Government on amendments and revisions and guidance of some articles of the Law on Environmental Protection provide detailed instruction for conducting environmental impact assessment for projects in Viet Nam including key items: project classification, scoping, description, public consultation, environmental management and monitoring plans etc.

21. The project does not encroach on wetlands and natural protected areas, neither does it relate to emission of persistent organic pollutants or international trade in endangered species of wild fauna and flora. Therefore, no relevant international environmental agreements to which Viet Nam is a party would apply.

22. An outline of the environmental legal framework of Viet Nam for which the subproject must comply is provided below.

1. Applicable laws

- (i) Environmental Protection Law (LEP) No.55/2014/QH13 January 01, 2015;
- (ii) Law on Water Resources No.17/2012/QH13 adopted by the National Assembly in 1/6/2012;
- (iii) Law on Biodiversity No.20/2008/QH12 passed by the National Assembly in 13/11/2008; and
- (iv) Environmental Protection Law No. 55/2014/QH13 ratified by the National Assembly of the Socialist Republic of Viet Nam on June 23, 2014.
- (v) Land Law No. 45/2013/QH13 dated 29 November 2013.
- (vi) Investment Law No. 67/2014/QH13 ratified by the National Assembly of the Socialist Republic of Viet Nam on November 26, 2014.

- (vii) Construction Law No. 50/2014/ QH13 ratified by the National Assembly of the Socialist Republic of Viet Nam on June 18, 2014.
- (viii) Law on Water Resources No. 17/2012/QH13 ratified by the National Assembly of the Socialist Republic of Viet Nam on June 21, 2012.
- (ix) Law on Standards and Technical Regulations No. 68/2006/QH11 ratified by the National Assembly of the Socialist Republic of Viet Nam on June 29, 2006.
- (x) Decree No. 18/2015/ND-CP dated April 1, 2015 of the Government promulgating environmental protection planning, strategic environmental assessment, environmental impact assessment and environmental protection plan.
- (xi) Circular No. 27/2015/TT-BTNMT dated May 29, 2015 of the Ministry of Natural Resources and Environment on strategic environmental assessment, environmental impact assessment and environmental protection plan.
- (xii) Circular No. 36/2015/TT-BTNMT dated June 30, 2015 of the Ministry of Natural Resources and Environment on hazardous waste management.

2. Decrees and Regulations

- (i) Decree No. 40/2019/ND-CP dated May 13, 2019 of the Government detailing the implementation of some articles of the Law on Environmental Protection.
- (ii) Circular No. 25/2019/TT-BTNMT dated December 31st, 2019 of the Ministry of Natural Resources and Environment on detailing the implementation of a number of articles of Decree No. 40/2019 / ND-CP of May 13th, 2019 of the Government on amending and supplementing a number of articles of the decrees detailing and guiding the implementation of the Law on Environmental Protection and the regulation on management of environmental monitoring activities
- (iii) Decree No. 201/2013/ND-CP dated November 27, 2013 of the Government detailing the implementation of some articles of the Law on Water Resources.
- (iv) Decree No. 127/2007/ND-CP dated August 1, 2007 of the Government stipulating the implementation of some articles of the Law on Standards and Technical Regulations.
- (v) Decree No. 80/2014/ND-CP dated August 6, 2014 of the Government stipulating drainage and wastewater treatment.
- (vi) Decree No. 38/2015/ND-CP dated April 24, 2015 of the Government on the management of waste and scrap.
- (vii) Decree No. 179/2013/ND-CP dated December 30, 2013 of the Government on sanctioning of administrative violations in the field of environmental protection.
- (viii) Decree No. 43/2014/ND-CP dated May 15, 2014 of the Government detailing the implementation of some articles of the Law on Land.
- (ix) Decree No. 44/2014/ND-CP dated May 15, 2014 of the Government regulating land prices.
- (x) Decree No. 45/2014/ND-CP dated 05/15/2014 of the Government providing the collection of land use levy.
- (xi) Decree No. 46/2014/ND-CP dated 05/15/2014 of the Government providing the collection of land and water surface lease.

- (xii) Decree No. 47/2014/ND-CP dated 05/15/2014 of the Government regulating compensation, support and resettlement upon land acquisition by the State.
- (xiii) Decree No. 84/2013/ND-CP of the Government on management of housing development and resettlement.
- (xiv) Decree No. 16/2016/ND-CP dated 03/16/2016 of the Government on the management and use of official development assistance (ODA) and preferential loans from donors;

3. National Technical Regulations on Air Quality, Noise and Vibration

- (i) QCVN 05:2013/BTNMT: National technical regulation on ambient air quality.
- (ii) QCVN 06:2009/BTNMT: National technical regulation on hazardous substances in ambient air.
- (iii) QCVN 26:2010/BTNMT: National technical regulation on noise.
- (iv) QCVN 27:2010/BTNMT: National technical regulation on vibration.
- (v) TCVN 5948:1999 - Acoustics - Noise emitted by Motor Vehicle in acceleration - Permitted maximum level

4. National Technical Regulations on water quality

- (i) QCVN 01: 2009/BYT: National technical regulation on drinking water quality.
- (ii) QCVN 02: 2009/BYT: National technical regulation on domestic water quality.
- (iii) QCVN 08-MT: 2015/BTNMT: National technical regulation on surface water quality.
- (iv) QCVN 09-MT: 2015/BTNMT: National technical regulation on ground water quality
- (v) QCVN 14:2008/BTNMT: National technical regulation on domestic wastewater.

5. Other relevant regulations

- (i) Decision No.3733/2002/QD-BYT of October 10, 2002 promulgating 21 labor hygiene standards, 05 principles and 07 labor hygiene measurements
- (ii) Law No.50/2014/QH13 dated 18/6/2014 of National Assembly on the construction
- (iii) Circular No.22/2010/TT-BXD dated 03/12/2010 of Ministry of Construction on labor safety in work construction
- (iv) Law No.10/2012/QH13 dated 18/6/2012 of National Assembly on Labor Code

6. Regulation related to COVID19, and other infectious diseases risk management

- (i) Law No. 03/2007/QH12 dated 21/11/2007 on Prevention and Control of Infectious Diseases
- (i) Decree 101/2010/ND-CP on the application of medical isolation, enforcement of medical isolation and specific anti-epidemic measure during the epidemic period

- (ii) Decree 89/2018/ND-CP on border medical quarantine
- (iii) Circular 17/2019/TT-BYT relating to monitoring and responding to infectious disease and epidemic regulates

7. International Guidelines

- (i) World Bank Group, 2007. Environmental Health and Safety Guidelines, Wash. DC
- (ii) IFC/World Bank Group, 2007. Environmental Health and Safety Guidelines. Industry Sector Guidelines, Infrastructure (Water and Sanitation), Wash. DC.
- (iii) World Health Organization, 1999. Guidelines for Community Noise.
- (iv) World Health Organization Guidelines for COVID -19

B. ADB Safeguards Policy

23. All ADB financed projects are required to undergo environmental assessment to ensure the environmental soundness and sustainability of the projects. It also aims to support the integration of the environmental considerations in the decision-making process.

24. The ADB's Safeguard Policy Statement, June 2009 (SPS) clarifies the rationale, scope and content an environmental assessment and is supported by Environment Safeguards Good Practice Sourcebook November 2012. The initial screening of the project to determine its environmental category was carried out using the Rapid Environmental Assessment (REA) Checklist as attached to the SPS. The proposed subproject is categorized as a Category "B" project which requires an IEE.

25. The SPS emphasizes the need for effective implementation of the environmental safeguards which are to:

- (i) Avoid possible impacts on the environment and affected people,
- (ii) Where possible minimize, mitigate and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and
- (iii) Help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

26. The SPS contains a number of operational principles that includes the requirement to ensure that the measures identified during the impact assessment are included in the EMP and are implemented in agreement with the borrower. The borrower/client is required to monitor the progress of implementation of the EMP, document the monitoring results, identify necessary corrective actions and reflect them in a corrective action plan. Periodic monitoring reports on implementation of the EMP are submitted to the ADB on a semi-annual basis during construction of projects with significant adverse environmental impacts and quarterly for highly complex and sensitive projects. During operation, reporting to the ADB for projects with significant adverse impacts is required on an annual basis.

C. International Environmental Management Conventions

27. Viet Nam is signatory to the following international conventions relevant to this subproject:

- (i) Convention Concerning the Protection of the World Cultural and Natural Heritage (1972)
- (ii) United Nations Framework Convention on Climate Change (1992)
- (iii) Convention on Biological Diversity (1992)

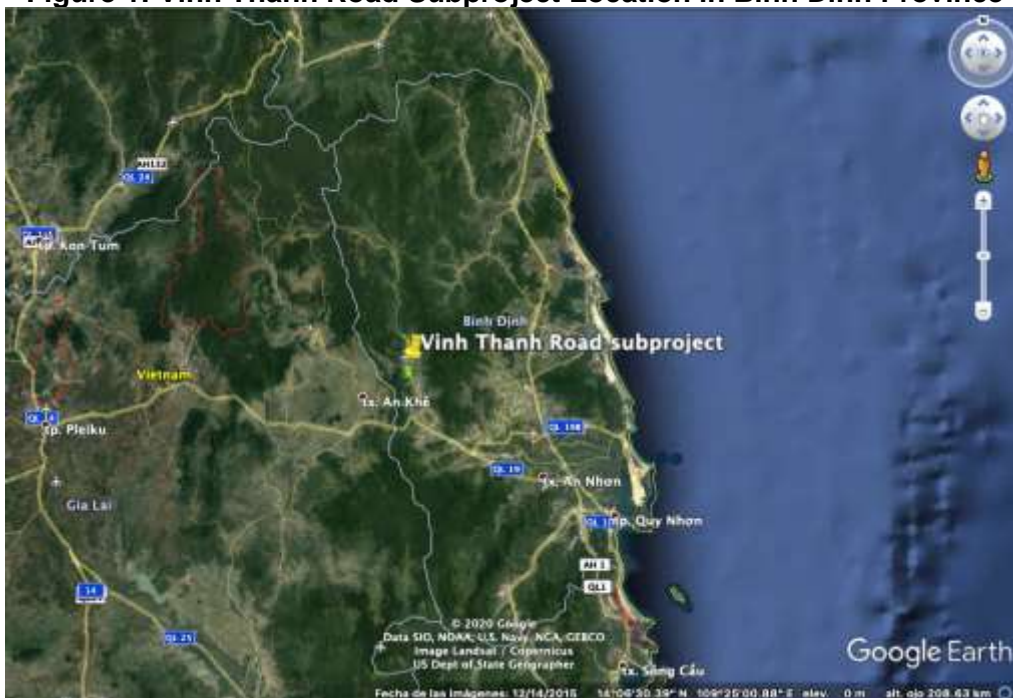
III. PROJECT DESCRIPTION

A. Overview

28. The Vinh Thanh Road Subproject will improve the current condition of one section of PR 637 to meet local demand and contribute the socio-economic development of regional areas including primarily, Dinh Truong, Dinh Trung and Klotpok villages - Vinh Quang Commune; Kon Krong, Dinh Binh villages - Vinh Thanh Town and Binh Dinh Province as a whole. The project also provides greater capacity to respond to local flooding and risks of climate change in Vinh Thanh District, Binh Dinh Province. The works involve the rehabilitation of a 2.4 km stretch of Vinh Thanh Road including reconstruction of three bridges: Ta Suc I, Ta Suc II and Suoi Xem. The road is located in Vinh Quang Commune and Vinh Thanh Town, Vinh Thanh District, Binh Dinh Province in the central part of Viet Nam approximately 80 km from Quy Nhon City.

29. Along the 2.4 km stretch, the surrounding land is used for cultivating annual crops such as maize, watermelon, chili, acacia and eucalyptus. There are several residences adjacent to the site on the edge of Vinh Thanh Town.

Figure 1: Vinh Thanh Road Subproject Location in Binh Dinh Province



Source: xxx.

30. The proposed subproject seeks to upgrade a 2.4km section of PR637 in the vicinity of Vinh Quang Commune and Vinh Thanh Town, Vinh Thanh District, Binh Dinh Province – see Figure 2.

Figure 2: Subproject Alignment



Source: xxx.

31. Specifically, the subproject is the PR637 section from Vinh Quang Commune– Vinh Thanh Town:

- (i) The starting point at Km 11+300, PR637 is in the vicinity of Dinh Quang Hamlet, Vinh Quang Commune, Vinh Thanh District;
- (ii) The end point at Km 13+665 is at the intersection of the PR637 and Ha Nhe – Dinh Binh (at Dinh Binh Bridge T-junction). Quarter 5 Vinh Thanh Town.
- (iii) The length of the road section is 2.4 km

Table 1: Subproject Technical Specifications

Name Representative	The Vinh Thanh Road Project
Length (km)	2.4
Road designed category IV (plains) subject to TCVN 4054-2005 with the following main specifications:	
Designed speed:	60 km/h
Road base width	9.0m
Pavement width	7.0m
Bridges designed category III (plains) subject to TCVN 4054-2005 with the following main specifications	
Road base width	12.0m
Pavement width	11.0m
District – Representative	Vinh Quang Commune
Total Number Districts	1
Total Number Communes	1

Source: TRTA Road FS, July 2019.

32. The proposed upgrading will follow the existing alignment, minimizing the requirement for additional land acquisition, and by utilizing the existing road foundation wherever possible to reduce construction quantities. At the Suoi Xem bridge (+ 12.7km) the alignment shall be adjusted to the right of the old bridge to minimize site clearance involving agricultural land while

ensuring the technical parameters of the road design category (category IV plain TCVN 4054-05). During construction this will enable the retention of the existing bridge to ensure traffic circulation.

33. The 2.4km section will be upgraded from existing Category VI road to a proposed category V road. Traffic demand forecasts clearly indicate the inadequacy of Category VI and V and as such the subproject will now upgrade the section to category IV (plains) based on TCVN 4054-05.

34. Structures along the section will also be upgraded to support the expected traffic demand and future hydrological conditions inclusive of climate change impacts. Drainage – both cross drainage and longitudinal drains will be designed according to the process of 22TCN 18-79, design load H30-BX80, design exceedance frequency of 4% (i.e. 1-in-25 years), scale according to the designed road base.

35. The three bridge structures along the alignment will be replaced with two bridges that are constructed with reinforced concrete according to the design standards TCN272-05; Design load: Live load HL93, pedestrian 30Mpa; Design frequency of big bridge and medium bridge $P = 1\%$ (i.e. 1-in-100 years); Bridge size (Bridge width): $B = 0.5 + 11 + 0.5 = 12.0\text{m}$.

36. Based on the TRTA road engineer's PR637 survey results, the following road area coordinates are based on Elevation system: Using VN2000 coordinates and specific national elevations:

- (i) Coordinating elevation class IV: VT01; X=1560153.336; Y=557402.559; H=57.703
- (ii) Coordinating elevation class IV: VT02; X=1559654.618; Y=557481.942; H=52.657

B. Network Rationale

37. The subproject will enable improved freight along PR637 (257km in length) from north central Gia Lai Province south through Vinh Thanh District to NH 19 at the southern end of Vinh Thanh and Tay Son Districts. NH19 provides the connection from Quy Nhon and NH1 to Pleiku Gia Lai Province in the Central Highlands and onto the Cambodian Border of Le Thanh with a length of about 234 km. NH19 is significant in the ASEAN Highway Network as part of the corridor in the Greater Mekong Subregion (GMS). The wider corridor that NH19 supports connects Bangkok to the Central Coast of Viet Nam through Cambodia, and is a major transport link for agricultural products of Gia Lai being the preferred transport route for commodities and people passing in and out of the central highlands as well as the cross-border trade from Cambodia and Southern Lao to NH1 and Quy Nhon Port.

38. The upgrading is expected to reduce freight costs within Vinh Thanh District from enabling heavier trucks to support the acacia forestry sector and local agricultural outputs, and for lowering the costs of transport of both raw materials and outputs for Ta Suc industrial cluster enterprises and from removing flood and wet season disconnections from flooding.

39. The subproject contribution to improved inclusiveness will be achieved through increased reliability and quality of the connectivity to the district center of Vinh Thanh small town with other urban settlements in the district, the provincial administration, and the proposed ecotourism site of Vinh Son to the north of Vinh Thanh district. The road will directly improve traffic conditions for the people in the communes such as Tay Thuan, Vinh Quang communes with the center of the Vinh Thanh district and province.

40. The subproject will complete the connection through to Vinh Quang District and the Ta Suc industrial cluster to the North East of Binh Dinh. The road enhances the commodity circulation for other localities of Tay Son and Vinh Thanh districts in term of trading, travelling and transporting agricultural products to the processing and consuming facilities providing lower costs, increased returns that support the competitive advantage of small producers and enterprises providing additional incentives for additional investment in production systems. The proposed road subproject contributes to the on-going improvement to the linkages within the Binh Dinh transport network as presented in the Provincial Transport Plan.

C. Existing Road

41. The following pictures capture the current condition of the road section to be upgraded under the subproject.



Vinh Thanh Town, end point



Ta Suc II Bridge



Hien Lac Gas Station



Cassava crop along the road



Flooding at Xem Stream Bridge



Flooding at km 13

D. Proposed Subproject

42. The proposed design of the road section and bridges are provided in Appendix 2. Traffic count surveys were carried out at two sites to estimate traffic volume at each end of the road section and future traffic volume projections made – see Table 2. This data has been used to upgrade the technical design standard to Category IV based on the projected Passenger Car unit (PCU) levels and the relationship to Government road categorization. Notable is the projected increase in all truck sizes and public transport i.e. buses highlighting the need to ensure structures have sufficient strength for the growth in axle weights. The traffic forecast also assumes, based on transport operator interviews, that medium truck traffic in the without-project scenario would consolidate into fewer heavy trucks in the with-project scenario, resulting in a net decrease in annual average daily traffic for the with-project scenario as compared to the without project scenario. By mid to late economic life the road strength will likely deteriorate as the PCU loadings approach and then exceed the maximum PCU rating for a category IV road.

Table 2: Projected Traffic Volume

Year	Motor-cycle	Car	Small, Medium Bus	Heavy Bus	Small, Medium Truck	Heavy Truck	Truck and Trailer	Total AADT	AADT except motor-cycle	ACGR (%)
Without Project:										
2019	2,056	201	40	22	309	27	1	2,656	600	
2023	2,214	231	46	25	355	31	1	2,903	688	3.5
2033	2,507	365	73	40	561	49	2	3,596	1,089	4.7
2043	2,570	577	115	63	887	77	3	4,292	1,722	4.7
With Project:										
2023	2,214	231	46	25	78	132	1	2,727	512	
2033	2,507	365	73	40	123	208	2	3,317	810	4.7
2043	2,570	577	115	63	195	329	3	3,852	1,282	4.7

AADT = annual average daily traffic, ACGR = annually compounded growth rate.

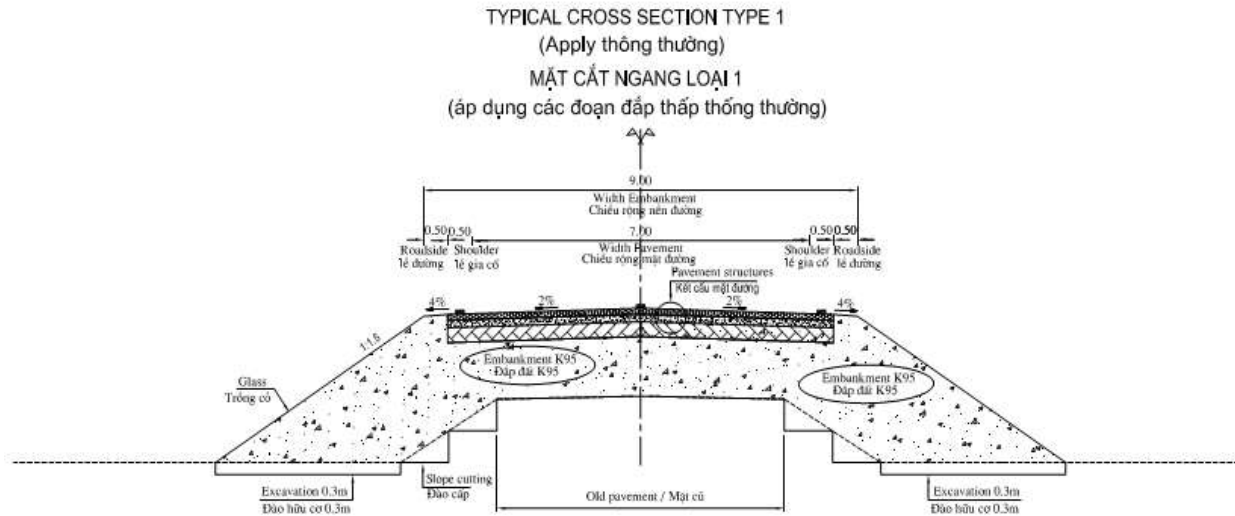
Source: Transaction technical assistance consultant.

43. Geometric design. The proposed route shall be designed as follows:

- a) The route shall be designed category IV in the plain and hilly topography subject to TCVN 4054-2005 with the following main specifications:

- Designed speed: 60 km/h
- Road base width: 9.0m
- Pavement width: 7.0m
- Sidewalk width: 2 x 1.0m

Figure 3: Typical Cross-Section of the Subproject Road



Source: xxx.

- b) The two replacement bridges - (i) Ta Suc Bridge Km11+565.46 (Crossing Stream) with length of 2x18.0 (50.15) m (ii) Suoi Xem Bridge Km12+736.55 (Crossing Xem Stream) with length of 6 x 33.0 (212.35) m shall be designed as category III in the plain and hilly topography subject to TCVN 4054-2005 with the following main specifications:

- (i) Road base width: 12.0 m
- (ii) Pavement width: 11.0 m
- (iii) Sidewalk width: 2 x 0.5 m

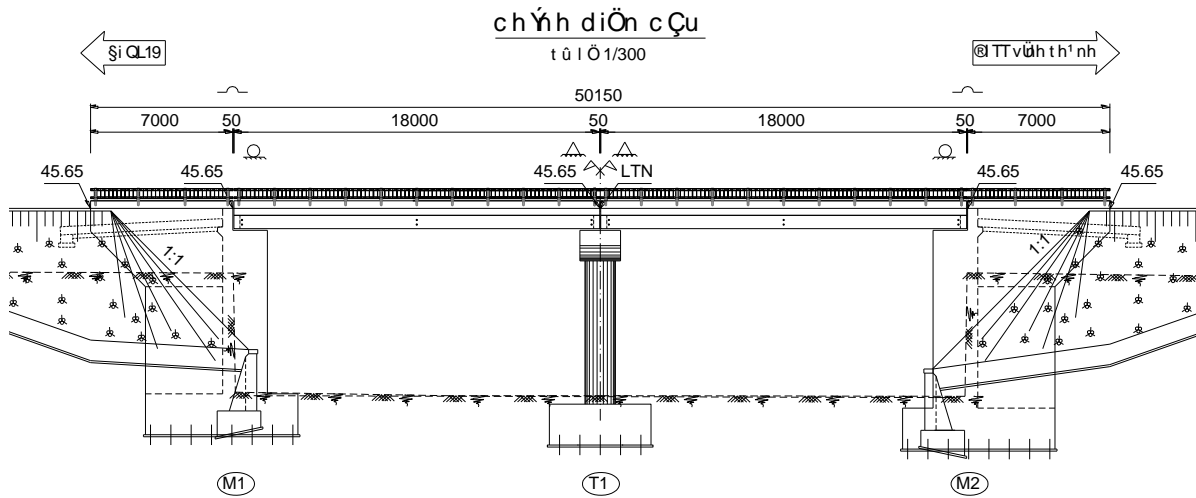
44. The alignment of the road basically follows the centerline of the existing road. At the location of Suoi Xem bridge, the alignment shall be adjusted to the right of the existing bridge to minimize the area of site clearance on agricultural land and to assure the specification of the designed road category, suitable to construction method, in which the existing bridge is still in use ensuring traffic during construction of the new bridge.

45. The bridge construction will comprise of:

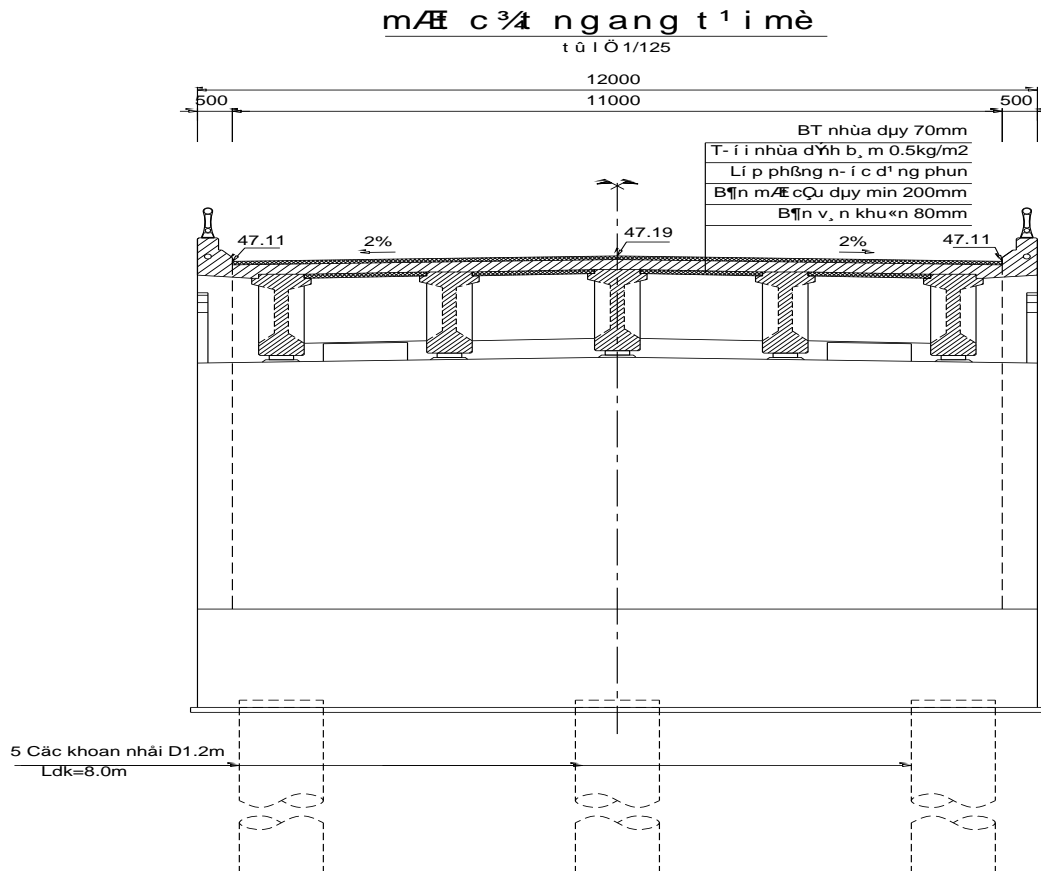
- (i) Construction of abutment: leveling construction ground, constructing cofferdam, excavation of foundation pit, erection of formwork, reinforcement, concrete pouring;
- (ii) Span construction: ground leveling for bridge girder casting on the road head foundation, casting beams, concrete over the bridge surface, completing bridges and constructing road section of bridges.

46. The main drawing of Ta Suc and Suoi Xem bridges area shown in the below figure:

Figure 4: Main Drawings of the Two Bridges



Main drawing of Ta Suc bridge



Main drawing of Suoi Xem bridge

Source: xxx.

47. **Equipment List.** Machinery likely to be used on the site is shown in Table 3 and includes a range of heavy and light machinery.

Table 3: List of expected construction machinery and equipment for the project

No	Device	No	Device
1	1.5KW cage dressing	22	Coil beam
2	Drill ED, KH, Soilmec	23	5KW iron cutting machine
3	Vertical drilling machine 4.5KW	24	Hammer compressed air
4	Diesel compressor 240m3/h	25	Diesel compressor 360m3/h
5	Truck crane 10T	26	80L mortar mixer
6	23KW welding machine	27	Mortar pump 9m3
7	Click 250T	28	16T crane
8	Water pump 20KW	29	Self-propelled concrete pump 50m3/h
9	Diesel compressor 600m3/h	30	Dump Truck 10T
10	Click 500T	31	Cars watering 5m3
11	3T pulley	32	Wheel Loader
12	Crawler crane 25T	33	Bulldozer
13	5T electric winch	34	Motorcycle
14	Drilling machine TRC-15	35	Wheel loader 1.6 m3
15	10kW cable cutter	36	Wheel loader
16	15kW cable	37	Grader
17	Edge dressing machine	38	Beams castings
18	2.8KW	39	Shredder
19	Jumbo three-wheel hydraulic drilling machine	40	Tire rollers
20	Stone breaker 1,300kg	41	Mixing Station
21	Concrete mixers		

Source: xxx.

48. **Camps.** It is expected that at the peak of construction period, 25 construction workers will be working on the road and both bridge sites. However, with the short distance of the road, size of the bridges and relatively simple construction activities will enable most of the unskilled labor to be sourced from the local area. There will be only one 1 temporary work camp at the site and local houses or vacant community houses can be rented if needed. Construction is expected to extend over two construction seasons depending on weather conditions.

49. **Construction materials.** Steel and cement will be provided by material suppliers from the towns in the local area within a range of 10km. Sand and gravel will be exploited from permitted quarries at short distances from construction sites. All of the materials shall be tested in terms of physical properties in accordance with the current regulations. If the materials compositions do not meet the standard, the contractor shall change the materials sources. Demands for material and technical supplies are associated with the construction progress.

50. The PR637 Road Rehabilitation does not involve large scale extraction of rocks, sand and gravel, therefore, does not require opening of any new quarry. None of existing quarries to be used is an exclusive source for the project. 227,244 m³ of earthwork material required for heightening elevation of some road sections and the two bridges will only be supplied from licensed quarries/borrow pits.

51. For the initial environmental examination of the PR637 Road Rehabilitation, the volume of construction material and possible sources (borrow pit and quarry mine), proposed disposal site with total areas and its capacity are not defined, due to design of construction has not yet completed. The preliminary assessment was conducted through consultations with relevant authorities showing possible construction material sources and spoil disposal sites (see below). A more detailed assessment to identify material sources and disposal sites will be required during detailed engineering design of the subproject, with results to be documented in the updated IEE/EMP. Detailed information of the proposed quarries and disposal sites is presented in Appendix 8.

52. After conducting and consulting with the local authorities, the TRTA engineering consultants came up with some suitable quarries including borrow pit, stone quarries, and sand source for the construction project.

53. **Soil borrow pits:** The estimated soil volume required for the subproject construction is 227,244.59 m³ while the excavated soil volume is 14,831 m³. All of the excavated soil will not be reused for filling, but disposed in the approved disposed site nearby. The soil borrow pit located in Ta Suc Industrial zone in Vinh Quang commune, Vinh Thanh district, Binh Dinh province, with a capacity of 100,000 m³, is deemed suitable for the partial supply of required soil. Additional soil borrow pit will be investigated and detailed in the detail design.

54. 2 disposal sites have been investigated for the subproject: (i) Disposal site 1: In the area of Km11 + 648, on the left of the road, the land area of old flume of Ta Suc bridge, Vinh Quang commune, Vinh Thanh district, Binh Dinh province. The size of the land is 100m long and 50m wide allowed to receive 25,000 m³ disposed material; (ii) Disposal site 2: In the area of Km11 + 648, on the right of the road, the land area of old flume of Ta Suc bridge, Vinh Quang commune, Vinh Thanh district, Binh Dinh province. The size of the land is 100m long and 50m wide allowed to receive 25,000 m³ disposed material.

55. **Power and fuel supply.** The national power grid is easily accessible in the project area. Mobile diesel generators will also be used as and when needed. The low-voltage power system has been distributed to the project area for construction and operation of facilities.

56. Oil and gas for the operation of machinery in the construction sites will be supplied by local petroleum stations along the road. Since the distribution network is available, the fuel supply for the project is quite convenient.

57. **Water supply for construction and domestic uses.** Water sources for the construction works will mainly come from streams available nearby. For domestic purposes, depending on conditions of given sites, water can be supplied from the centralized water supply schemes where available and dug and drilled wells at the construction sites. Where water schemes are not available for domestic use, water from wells will be purified through an on-site simple filter system and/or clean water in tanks will be supplied.

58. **Implementation arrangements.** The Binh Dinh People's Committee is the Executing Agency and the Binh Dinh Provincial Project Management Unit (PPMU) is the Implementing Agency responsible for the implementation of the Project.

E. Investment Cost

59. Estimated Project investment costs are presented in Table 6 with and without adjustment for climate change resilience. The costs are prepared based on the relevant road

and bridge design standards of the government of Viet Nam. Two costing scenarios are presented reflecting the requirement of ADB to quantify the incremental cost of future climate change resilience. The base scenario uses the current government design standards and methods where roads and bridges are designed to the relevant exceedance frequency – being P4 for the road section and P2 for the bridges based on the historical record of the local meteorological station.

60. Under the climate change scenario, the expected future value of P4 and P2 is used within the engineering design. These anticipated P2 and P4 levels are estimated base don't eh IPCC RCP 8.5 projections, and use the procedures adopted by ADB, 2018. These procedures use extreme event analysis using the projected data for daily maximum rainfall. For the current subproject this resulted in higher Q Max projections that were then integrated into the engineering designs. Based on the projected daily maximum rainfall the expected flood levels were estimated using Sokolov equation and also through comparative assessment with the Con River hydrological record. Based on the estimated anticipated flood levels were identified and applied to the design standards for road and bridge elevations and structural elements. The resultant change in BoQ and cost estimate provided a 1.6% increase in capital cost relative to the current historical flood design levels.

Table 4: Investment Estimate

No.	Cost items	Without Climate Change		With Climate Change	
		Option 1 VND	Option 1 US\$	Option 2 VND	Option 2 US\$
1	Land acquisition and resettlement costs (Provisional)	8,931,501,480	380,064	8,931,501,480	380,064
2	Construction costs	98,420,808,000	4,188,119	100,155,867,000	4,261,952
2.1	Road construction cost	35,158,185,065	1,496,093	36,279,612,888	1,543,813
2.2	Bridges construction cost	63,262,623,000	2,692,027	63,876,254,000	2,718,138
3	Project management costs	1,633,364,000	69,505	1,647,624,000	70,112
4	Cost of construction investment consultancy	4,553,769,000	193,777	4,590,529,000	195,342
5	Other costs	6,134,557,000	261,045	6,224,364,000	264,867
6	Contingency costs	16,611,000,000	706,851	16,893,000,000	718,841
	TOTAL	136,284,999,480	5,799,362	138,442,885,480	5,891,187
		Climate change incremental cost			Plus 1.6%

Source: 2019 FS report of the Project

F. Implementation arrangement and schedule

61. The Binh Dinh PPC is the Executing Agency and the Binh Dinh Province Project Management Unit (PPMU) of Construction Investment Works for Agriculture Rural Development is the Implementing Agency responsible for the implementation of the Project. The construction period is expected July 2022 to Dec. 2023. During the construction phase, Construction Supervisor Consultants (CSC) will be responsible for supervising construction activities against approved technical standards and construction progress including implementation of the construction EMP (CEMP) which are prepared by contractors based on approved IEE/EMP and approved by PMU.

62. An indicative implementation arrangement and schedule is provided in table 5.

Table 5: Vinh Thanh Subproject Implementation Schedule Expected

No	Vinh Thanh Road subproject Implementation	Timelines expected
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	Activities	
1	FS approved	Q3 2020
2	DED approved	Q2 2021
3	Land acquisition and compensation	Q2 2021 to Q1 2022
4	Site clearance	Q1 2022
5	Works contractor procured and contract awarded	Q2 2022
6	Construction works	July 2022 to Dec 2023
7	Construction handover	Sep 2024

Source: xxx.

IV. DESCRIPTION OF THE ENVIRONMENT

A. Physical Environment

1. Topography and Geology

63. Vinh Thanh is a mountainous district located along the Con river basin that to the west borders Gia Lai province running from An Khe mountain pass to Kanak. The average altitude of the area is 700m above sea level. Vinh Thanh district is bordered to the east with Hoai An (to the north) and Phu Cat districts, under influence from the mountain range from Nhon My to the end of An Toan commune that results in significant volumes of local output passing back into Vinh Thanh District.

64. **Vinh Thanh geology and soil.** The mountainous district of Vinh Thanh is formed on basal soil, including purple-brown, reddish brown, yellow brown soil at an altitude of less than 900m and reddish brown humus at an altitude of over 900m. The common feature of this soil type is that the terrain is less sloping than the soil group developed on granite. Weathered parent rocks create thick soil layers, heavy mechanical composition, good structure and relatively high fertility. Due to the thick, porous soil layer, the soil has high water absorption ability. On this soil group, there was a well-developed tropical rainforest carpet; however, natural forest cover has been reduced significantly through use for agriculture and more recently the conversion into acacia plantations.

65. The topography through which the road section passes is mostly flat, on mainly alluvial soil for 1.5km along the Con River and across the Xem River. In the rainy season the route is flooded several times a year due to the higher water levels in the Con River and Xem River. During the 2013 flood, water levels were about 1.2 m higher than the existing bridge elevation, and inundation lasted between 5–7 days.

2. Climate

66. **Temperature.** Vinh Thanh is a mountainous district subject to the circulation of monsoonal winds and influenced by the Truong Son range. The district's weather is characterized by hot and humid tropical weather and rainy season. The average annual temperature is 26 - 28°C.

Table 6: Daily Temperature Recorded in the Project Area in 2017

Month Sta.	1 Jan	2	3	4	5	6	7	8	9	10	11	12 Dec	Year total
Quy Nhon	24.6	24.2	25.9	27.3	29.1	30.6	30	30	29.5	27.2	26.2	24.1	27.4

Source: Binh Dinh Statistics Yearbook, 2018.

67. **Sunshine hours.** Total sunshine hours in Binh Dinh Province in 2016 are 2590. The highest sunshine hours are observed in July while the lowest is in December.

Table 7: Monthly Sunshine Hours in the Project Area
(hr)

Month Sta.	1	2	3	4	5	6	7	8	9	10	11	12	Year Total
Binh Dinh	185	216	258	265	263	235	245	231	200	179	145	140	2590

Source: Binh Dinh Statistic Yearbook

68. **Wind regime.** Due to the complex mountain terrain in Binh Dinh province, the monsoon winds change greatly in terms of direction and intensity as they move inland. Between October and March, the dominant wind direction is northeast and north. From May to August the wind direction is mainly southwest and south. April and September are transitional periods. Owing to being shielded by the Central Truong Son Range and the Central Highlands, the southwest monsoon wind is blocked and releases rain in the west. When coming to Binh Dinh, it becomes hot and forms a hot south wind. The south wind appears in the middle and late summer, from June to August.

69. **Precipitation.** The average annual rainfall is 1,835mm, with clear seasonal distribution. The rainy season lasts from October to December, concentrating 70-80% of the annual rainfall. At this time many storms occur, causing frequent flooding. A prolonged dry season causes frequent drought in many places. The average annual evaporation of rainfall is 900-1,100mm, accounting for 50-55% of the total rainfall.

Table 8: Distribution of Monthly Precipitation in the Project Area
(mm)

Month Sta.	1	2	3	4	5	6	7	8	9	10	11	12	Total
Vinh Thanh	29.6	12.8	28.9	51.8	152.7	138.3	120.9	121.8	227.8	434.8	387.0	129.0	1835.3

Source: Central hydro-meteorological center, Quy Nhon.

Table 9: Typical Characteristics of Rainfall Recorded for Project Area in Vinh Thanh District

Station	Year Avg.	Max	Year of Event	Min	Year of Event
Vinh Thanh	1835.3	3,613.0	1981	268.9	1982

Source: Central hydro-meteorological Center

70. **Humidity.** The average annual humidity in Binh Dinh province varies from 76 to 81%. The average humidity also shows a clear differentiation from the highlands to the coastal plains. The amplitude of the moisture shedding is quite large, from 96% in Vinh Son in April to 70% in Quy Nhon city in July. The annual variation of relative humidity also fluctuates with the general trend of higher humidity in the cold winter months and lower in the hot summer months.

71. **Air quality, noise.** No data of air quality and noise at the construction location was available. The assessment of ambient air quality and noise levels in the project areas are referred to the Environmental Monitoring Report of Binh Dinh 2018 prepared by the Department

of Natural Resources and Environment (DONRE) Binh Dinh. The report provided assessment of environment quality in the whole province. The assessment of ambient air quality at some points from 2016-2018 in Binh Dinh province shows that most of the basic parameters are within the permitted standards, except for dust parameters and the noise level exceeding the permitted standards. The results of total suspended particulate (TSP) and noise monitoring in 2018 showed that only two monitoring stations in Quy Nhon city and near Phu Cat airport had concentrations exceeding the permitted standards. The report concluded that the air quality at all towns nearest to the subproject, including Vinh Thanh town – about 1km from the subproject area, is still in good condition and shows no level of air pollution exceeding the national standard.⁷ (Source: Binh Dinh EIA report, 2018). Before construction, environment sampling program, including air quality and noise will be conducted by a recognized environment laboratory to be recruited under LIC contract to establish a robust pre-construction baseline.

72. **Extreme weather.** Binh Dinh Province is regularly struck by heavy storms/typhoons, occurring mainly between October and December. Whilst the project site is situated inland, it is frequently affected by storms with a large scope of influence. In 2018, there were 9 storms, of which 4 struck the inland area. (Source: Binh Dinh Disaster Prevention and Rescue Board, 2019). In Vinh Thanh, it is reported that there were two historically heavy storms and subsequent long floods in 1984 and 2013.

3. Hydrology

73. Vinh Thanh district has two large river catchments including the Con river and Xem stream. The Con river valley is 42km long, divided by two large stretches of mountains with many large tributaries flowing in including the Xem stream, Ta Xom stream, Ha Ron stream Nuoc Trinh stream along with and many other smaller branches and streams, and a network of artificial canals. This creates a diverse and favorable landscape for economic development of Vinh Thanh district.

74. The subproject road crosses 2 main waterways: the Ta Suc stream and the Xem stream with the road section currently comprising three bridge structures – two for small crossings of the Ta Suc stream and a large bridge crossing the Xem river. The subproject will replace three bridges with two bridges – one crossing the Ta Suc stream and the other upgrading the Xem River bridge.

75. The section of PR637 road is currently a category VI plains road. The subproject road section floods on average between 2 to 4 times per year for up to 7 days per event, cutting the left bank Con River communes off from the wider road network. The flooding is a complex interaction of Con river flood levels and the Xem River catchment flood water release. The Con river water levels back flow up the Xem river beyond the road crossing alignment. The co river flood levels are modified by the Dinh Binh Reservoir water management regime.

76. **Water Quality.** The TRTA consultant has collected and cross-checked the available data of surface water in the area from different sources such as Vinh Thanh District Annual Environmental Report 2018, Binh Dinh Water Resources Masterplan 2017. It is reported that parameters sampled and analyzed for surface water on the Con River near the road site are within allowed limits set by current applicable standard and can be used as drinking water with proper water treatment. The results are presented in Table 9.

⁷ Binh Dinh Environmental Status Report by Department of Natural Resources and Environment, 2018.

Table 10: Analysis of Surface Water Quality

No	Parameter	Analysis results		Limits set by QCVN 08 2015 for Surface Water	
		NM1	NM2	A ₂	B ₁
01	pH	7,06	6,82	6-8,5	5,5-9
02	DO	6,72	6,08	≥ 5	≥4
03	TSS	34	35	30	50
04	BOD ₅ (20°C)	13	16	6	15
05	COD	21	29	15	30
06	Coliform	430	930	5000	7500

Note:

NM1: sampling location in Dinh Binh Reservoir, upstream of Con River

NM2: sampling location in Vinh Quang Commune, downstream of Con River

77. **Groundwater quality.** No specific data is available for groundwater quality in the project area. According to Environmental Monitoring Report of Binh Dinh in 2018, the results of groundwater quality at various points in the province over the years show that most of the basic parameters (hardness, TDS, ammonium, permanganate, nitrite, Fe, and Mn) are within the allowable standards, except coliform at some points which exceed the standard. The environmental monitoring results in 2018 show that most of the observed groundwater samples are contaminated with microorganisms, in which the areas are buried with solid waste landfills (CTR) and concentrated livestock areas have a higher pollution level than other areas.

B. Biological Environment

1. Land use, Land cover, Terrestrial Ecosystem

78. Binh Dinh province forestry land area is about 370,514 ha, accounting for 60% of the natural area of the province, of which 110,124 ha is planted forest and 47,420 ha of natural forest. Compared with the central region, Binh Dinh has a medium level of forest biodiversity comprising many migrant plants from various streams from north to south, including the Southern Chinese, Indonesian, Malaysian flora that have previously supported rare indigenous species.

79. Vinh Thanh district has nearly 60,000 ha of forest land, of which more than 51,800 ha are forested land with forest coverage of 72%. The forest in Vinh Thanh has many kinds of valuable trees such as ironwood, rosewood, teal, ebony, padauk (*Pterocarpus macrocarpus*) *Michelia sp*, cassod tree (*Senna siamea*), *Hopea*. Some areas of the natural forest are also known for having several wild animals such as bears, pheasants, peacocks, monitor lizards, pythons, and golden turtles.

80. Over the past years, Vinh Thanh district has implemented many active solutions in forest protection and forest fire prevention and fighting to contribute to sustainable forest management and development.

81. The vegetation of the direct project area is dominated by annual cropping including rice and vegetable production with the wider District output supporting acacia, cassava and sugarcane. Ta Suc Industrial Cluster is located on the left of the road, near the start point while at the end point is Dinh Binh village, Vinh Thanh town with Vinh Thanh town primary school locates roadside (about 15m).

Figure 5: Land Distribution Along the Subproject Route



Source: xxx.

2. Aquatic Ecosystem

82. According to the Biodiversity Conservation Masterplan in Binh Dinh Province to 2025, orientation to 2030 (2017), the aquatic ecosystem characterized by streams in Binh Dinh province includes aquatic plants (Macrophyta), various small snails of the Thiariadae and Viviparidae families, crabs of the Potamidae family, various small sized fish species and insect larvae are plentiful. Due to the high transparency of the water, the Periphyton rock algae groups develop, providing an important food base for fish and invertebrates.

83. The aquatic freshwater ecosystems in Binh Dinh Province are reported to have high incidence of endemic species. The subproject will take appropriate actions to ensure environmental flows are maintained and protected at all times within the Ta Suc, and Xem streams, tributaries of Con River during bridge construction and that construction site waste or soil erosion does not flow into these ecosystems.

84. There are no records of rare species of terrestrial or aquatic animals in the project area. Within the project area fauna is limited to common species of birds, snakes, and insects. Domestic animals such as buffalos, cows, goats and pigs are also predominant.

3. Conservation Areas

85. The district of Vinh Thanh has the historical and cultural forest landscape of the Nguyen Hue Orange Tree Garden that was recognized as historical relics in 1993 and was upgraded to a national site in 1995. This area seeks to preserve a historical and natural culture in Vinh Son commune, Vinh Thanh district on the northern end of PR637. In 2014, the Prime Minister approved the Nguyen Hue Orange Tree Garden as a landscape protection area of 752ha. Currently, this area is being preserved as a historical monument, landscape restoration and watershed protection for Con River and for the Hydropower reservoirs in Vinh Son, serving the development of eco-tourism and cultural tourism for Bana ethnic community. This area also has a few natural forests, relics from Quang Trung dynasty and some revolutionary relics of the resistance in the French and American wars.

86. The subproject site survey confirmed that the subproject does not encroach on any

existing or proposed conservation area. The location of the road is about 28 km from the nearest zone of the Nguyen Hue Orange Tree Garden. The road is also about 32 km west to the Con Ka Kinh National Park, in the neighboring province of Gia Lai.

87. The survey findings are consistent with ADB’s IBAT proximity screening conducted in May 2019. IBAT reported that Nguyen Hue Orange Tree Garden protected site is found within a buffer of 15 km from road site in Vinh Thanh District. However, the distance is almost double this at 28 km. The nearest biodiversity conservation area to the subproject is Kon Ka Kinh National Park, about 40km to the Northwest of the subproject route.

C. Socio-economic conditions

1. Population

88. Vinh Thanh district has 9 subordinate administrative units: including 1 town, and 8 communes and is divided into smaller administrative units (hamlet, villages, quarters ...). The proposed project road traverses Vinh Quang commune with a population of 3,829 and Vinh Thanh town with a population of 5,476. The total population of Vinh Thanh District is reported to be 28,790 in 2017. Whilst the average population density for the District is 40 km² the population density in Vinh Quang is 156 km² and for Vinh Thanh Town 583 per km². Whilst households in Vinh Thanh Town are classified as urban most have either direct or indirect links to the agriculture or forestry sector. The population statistics are shown in table 11.

Table 11: Population Data for Vinh Thanh District⁸

	Area (km ²)	Average population (person)	Population density (person per km ²)
TOTAL	716.907	28790	40
Vinh Thanh Town	9.396	5476	583
Vinh Son Commune	168.656	2854	17
Vinh Kim Commune	160.236	1809	11
Vinh Hiep Commune	83.369	2980	36
Vinh Hao Commune	155.359	2725	18
Vinh Hoa Commune	29.333	1619	55
Vinh Thinh Commune	50.54	6113	121
Vinh Thuan Commune	35.426	1385	39
Vinh Quang Commune	24.592	3829	156

Source: Vinh Thanh Statistics Yearbook, 2017

2. Economy

89. The economy of Vinh Thanh District is predominantly agriculture, forestry and fisheries (50.03%) with trade and services (43.9%) and a small-scale industrial sector (6.07%). The local administration annual budget revenue mobilization is low with the district relying on support from the central and provincial governments. The district per capita income is low at VND 22 million (~USD 1000)/year and the number of poor households is high (51%).

⁸ The subproject area consists of Vinh Quang commune, and Vinh Thanh town.

90. The industrial manufacturing sector in the district is underdeveloped and comprises the small sized Ta Suc industrial cluster centered around the processing of acacia production and the Dong Tam Vinh Thanh Cassava Starch Plant located outside the industrial cluster for processing cassava.

91. Vinh Quang Commune is a poor commune in Vinh Thanh District. The key economic activities in the commune is farming rice, corn and other crops like chili and allium Chinese onion. By end of 2018, the GDP per capita of the commune is 20.3 mil VND and the poverty incidence drops to 33.69%.⁹

92. The economy of Vinh Thanh Town is more small industry, commerce and service oriented (70%). At present, there are 192 production and business establishments in the town, 389 households participating in business with a variety of industries such as construction materials, repairing agricultural machines, garments, trading miscellaneous goods and restaurant services. Dinh Binh market has been newly invested facilitating the exchange and trade of goods in the area.¹⁰

3. Ethnic minority groups

93. In Vinh Thanh district 31/59 villages are home to ethnic minority people and about 30% of Vinh Thanh District's population belong to ethnic minority groups, a large proportion of which live below the poverty line. The number of ethnic minority people in Vinh Thanh district is approximately 10,050 or approximately 25% of the total population with the main EM group identifying as H'rê. The TRTA social survey found the Hre community to comprise of households that were both better educated and had higher incomes than non-Hre households.

4. Project Affected People

94. About 3.6 hectares of productive land will be acquired for road construction. Construction activity will result in land acquisition affecting 71 households (AHH's) in two communes (including 45 households in Vinh Quang commune and 26 households in Vinh Thanh town). Approximately 451 square meters of residential land will be acquired.

Table 12: Impacts on Households and Organization

Commune/Town	Affected HHs (numb)	Marginally Affected HH11	Severely Affected HHs (numb)	Vulnerable HHs (numb)	Affected ethnic minority HHs	Relocation HHs	Affected organization	Affected Enterprises
Vinh Quang	45	40	5	10	0	0	1	2
Vinh Thanh	26	21	5	9	0	0	1	3
Total	71	61	10	19	0	0	2	5

Source: IOL in June 2019

95. In total the extent of land acquisition is relatively small with 3.59 ha required of which the

⁹ <http://vinhthanh.binhdinh.gov.vn/newsdetail.php?newsid=4238&id=205>

¹⁰ <http://vinhthanh.binhdinh.gov.vn/newsdetail.php?newsid=1534&id=119>

¹¹ Marginally affected AHs loose under 10% of total productive land, one part of residential area without relocation or rebuilding of their houses on the remained land areas.

vast majority is agricultural land.

Table 13: Land Acquisition Required for Subproject
(m²)

No.	Commune/ Town	Total affected land area	Residential land	Annual agriculture land	Other public land
1	Vinh Quang	22,901	0	19,350	3,100
2	Vinh Thanh	12,961	451	10,611	2,350
	Total	35,862	451	29,961	5,450

D. Social Infrastructure

1. Transportation

96. Vinh Thanh district is located in the mountainous area of Binh Dinh Province where the transport system has been very difficult. The main routes in the District are the Vinh Thanh – Vinh Thuan inter-district route and Provincial Road 637 with Class V-VI (TCVN4054-2005). Since 2016, communes in the district have implemented 45.6 km of rural road concretization with support funds and subsidies. As a result, the communal and inter-communal roads and village roads have been concreted making them easier to travel on and contributing to economic development for the local people.

2. Healthcare and Education

97. The education system in Vinh Thanh district ranges from kindergarten level to secondary school. There are 3 preschools, and 18 primary and secondary schools in the district, of which one boarding school has been established for the district's ethnic minority students. There are a few education facilities along the project road, but only Vinh Thanh Town Primary School, located some 15m from the road edge, is likely to be impacted by the project.

98. Vinh Thanh District healthcare services and facilities are basic. There is one district healthcare center in Vinh Thanh Town. Clinics exist at all 8 communes in Vinh Thanh District. There are no healthcare facilities directly adjacent to the road section supported by the subproject.

99. One hundred percent of communes and towns of the district meet the National Criteria for Health, Population, Work and Family Planning. Most of the households in Vinh Town have access to a reticulated drinking water supply. Other households in Vinh Quang commune use dug/drilled wells as primary water sources for drinking. In Vinh Thanh District domestic waste is disposed of at home normally using landfill holes. Waste generated in offices and markets is collected and handled at a landfill by a collective environmental unit.

E. Cultural and Heritage Sites

100. There are no significant historical or cultural sites, places of interest or other environmentally sensitive areas within or near the project construction site.

101. The consultant has investigated all possible sensitive receptors in a range of 5km from the proposed road section. Below is the list of sensitive receptors along the PR637 proposed section. #5 & #6 in the list are affected by occasional flooding during rainy season.

Table 14: Sensitive Socio-Economic Receptors Along the Road Section

No	Item	Distance to the road
1	Vinh Quang Communal Office	Next to the road, on the left
2	Huynh Thi Dao Secondary School	330m to the road, on the right
3	Vinh Thinh No.1 Primary School	350m to the road, on the right
4	Vinh Thinh Communal Office	330m to the road, on the right
5	Ta Suc Industrial Cluster	Next to the road, on the left
6	Hien Lac Gas Station	Next to the road, on the left
7	Vinh Thanh Town Primary School	15m to the road, on the left
8	Vinh Thanh Town Secondary School	200m to the road, on the left
9	Vinh Thanh Town Kindergarten	250m to the road, on the left

No	Item	Distance to the road
10	Vinh Thanh Town Football court	300m to the road, on the left
11	Binh Dinh Market	200m to the road, on the left
12	Vinh Thanh District Hospital	1,500m to the road, on the left

Source: xxx.

F. Archaeological, Historical and Cultural Treasures

102. There are several historical sites located in the wider subproject area but mainly from the wartime between 1954 and 1976. In Vinh Thanh district, there is only one archaeological site - Dong Truong cave - in the administrative area of Hoi Son commune, located roadside of NR7, about 15 km to the East of the subproject starting point. The archaeologists have discovered from Dong Truong tools from Stone Age, ceramic, bronze and iron tools and tombs. There are 10 tombs with ages from 10,000 to 12,000 years.¹ In case of excavations lead to the discovery of artifacts, procedures for addressing chance finds of antiques and artifacts will be set up for the construction phase in line with national regulations.

V. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

A. Information Disclosure

103. Formal disclosure of information on the proposed subproject to affected persons and other stakeholders in the Vinh Thanh District, Binh Dinh Province occurred during the IEE preparation as well as the REMDP preparation. The draft IEE was made available to the stakeholders contacted during consultation in written Vietnamese language. The final draft IEE will also be disclosed on the project website of Binh Dinh PPMU.

B. Public Consultation

104. Stakeholder consultation was conducted to meet the requirements of meaningful consultation as stipulated by the SPS (2009). The strategy embodied the principles of meaningful engagement, transparency, participation, and inclusiveness to ensure that affected and vulnerable groups such as women, ethnic minority people were given equal opportunities to participate in the design of the Project.

1. Identification of Stakeholders

105. Stakeholders were identified and engaged in a participatory manner. Stakeholder communication focused on institutional stakeholders, affected communities, and persons directly affected by proposed Project interventions.

106. The stakeholders of the Project include:

- (i) Mass organizations such as Fatherland Front, Women's Union, and Farmers Union which provided information for the design of the various Project interventions, and which might participate in implementation of measures and interventions;
- (ii) Households and businesses living near the road and the local farmers with land adjacent to the road. Most of these may be directly and/or adversely affected,

¹ <http://ngaynay.vn/van-hoa/di-chi-khao-co-hoc-dong-truong-nghe-an-lieu-co-chim-vao-quen-lang-2610.html>

- and who have an interest in the identification and implementation of measures to avoid or minimize negative impacts; and
- (iii) Other institutions or individuals with a vested interest in the outcomes and/or impacts of the Project including (i) PPC, (ii) DPC; (iii) commune and town leaders.

107. Consultations were conducted during 24-26 April 2019 involving the District PMU, Vinh Thanh District, Vinh Thanh town, and Vinh Quang commune.

108. During the subproject feasibility the TRTA and the PPMU/PPC have agreed that the management and operation of the road network will be transferred to the Binh Dinh Department of Transport (DoT). The DoT currently manages all provincial road networks. As part of the assessments the subproject proposals, network designs, and the financial viability assessments have all been thoroughly discussed and reviewed by the DoT along with the PPMU as the IA and district authorities.

2. Public consultation meeting

109. A formal consultation with People's Committees in Vinh Thanh District, Vinh Thanh Town, and Vinh Quang commune and potentially affected people, with a total of 45 people, of whom are 15 people in Vinh Thanh district, 15 people in Vinh Thanh town, and 15 people in Vinh Quang commune, and village representatives for Vinh Thanh road respectively through meetings conducted by the consultant in 24-25 April 2019. The notes of consultation meeting are in Appendix 3. The public meetings consisted of the following:

- (i) The design and environmental consultants introduced the Project including the project location and design; and
- (ii) The environmental consultant presented ADB's environmental policy, safety regulations in the Viet Nam road sector, anticipated social and environmental impacts and respective mitigation measures, the proposed grievance redress mechanism for environmental and resettlement problems.
- (iii) During the meeting the participants raised their questions and comments on the environmental issues. The environmental national consultant answered and explained all questions to the participants. While some locals directed their concerns to the proposed component of the Project, a larger number of the concerns were related to the adverse impacts during the construction phase. These impacts are presented in the following table.

110. The main comments of district, town communal authorities and local communities and people are as follows:

- (i) Local authorities and people all support the subproject.
- (ii) Agreement with the development of the project in their locality for the benefits of economy and the environment as providing improved road infrastructure.
- (iii) Agreement with the environmental impacts of the project addressed in the locality.
- (iv) Agreement with the solutions and measures to mitigate environmental impacts of the project.

- (v) The project owner should ensure all mitigation measures during the construction phase are implemented, especially to avoid disturbances to environmental and social life and, provide sufficient compensation for AHs as specified by laws.

111. The summary of comments/questions from consultations with local stakeholders and local authorities, and affected people and responses from consultants are summarized in Table 13. However, required input from stakeholders and response from project owners will occur through the Grievance Redress Mechanism (see below).

112. The summary of comments/questions from consultations with local stakeholders and local authorities, and affected people and responses from consultants are summarized in Table 13. However, required input from stakeholders and response from project owners will occur through the Grievance Redress Mechanism (see below).

3. Future Public Consultation and Information Disclosure

113. As part of the stakeholder communication strategy, once the IEE is completed, the final IEE will be translated into the local languages, endorsed Binh Dinh PPC and distributed to the CPCs/DPCs, and made available for public review for a period of at least 30 days before commencing of construction work. The revised IEE, reflecting detailed engineering design, will be submitted to ADB for clearance and disclosure on the ADB website. Regular information exchange and meetings with stakeholders are strongly encouraged throughout implementation of the Project.

Table 15: Summary of Issues and Concerns with the Subproject

Location and time	Comments/questions local authorities and people	Responses from consultants	Address in the IEE/subproject
<p>Vinh Thanh Town 25/04/2019</p>	<p>Concerns expressed: Increasing numbers of heavy trucks and the speeds as the consequence of improved road conditions and driving condition</p>	<p>How concerns are addressed in IEE Speed limit/ loading limit will be installed at the start and end points of the road junctions to Vinh Thanh town center and Vinh Quang commune, National Road No.19.</p>	<p>Road humps /traffic calming measures will be installed when the road goes through the sensitive areas such as residential areas of Vinh Thanh town; Vinh Quang commune center. Road hump/ traffic calming measures and side board should also be installed at the areas of school at different level, kindergarten, fuel stations, market, commune center and medical clinic.</p>
	<p>Road safety issues at the sections go through high residential areas</p>	<p>Speed limit/ loading limit will be installed at the start and end points of the road junctions to Vinh Thanh town center and Vinh Quang commune, National Road No.19.</p>	<p>Public awareness raising and consultations on road safety; Road hump/ traffic calming measures and side board should also be installed at the areas of school at different level, kindergarten, fuel stations, market, commune center and medical clinic.</p>
	<p>Concerns expressed: Hygiene and safety condition in construction phase, especially school, and Vinh Thanh town market area in Vinh Thanh town</p>	<p>ESS will conduct training for contractors on safety and environmental hygiene. The workers will be instructed construction camp rules and site arrangement. All areas of excavation greater than 1m deep and insides of temporary works should be fenced with sign boards installed. The contractors in collaboration with ESP and PPMU will also work with Vinh Thanh town and Vinh Quang CPCs. The CSC and PPMU will be responsible for supervision activities during construction phase and response timely for any raised opinions/ comments</p>	<p>The CEMP should be prepared and approved prior to the construction work</p>

Location and time	Comments/questions local authorities and	Responses from consultants	Address in the IEE/subproject
		from local people and authorities.	
Vinh Quang Commune and Vinh Thanh (Klot Pot and Kong Kring hamlets)	Cumulative construction impact of the PR637 road and 2 new bridges in Vinh Quang commune, and Vinh Thanh town	PPMU and ESS will work with Vinh Thanh town and Vinh Quang CPC and the contractor of Vinh Thanh PR637 road to define suitable construction schedule, machine and worker mobilization plan to avoid concentration of construction works at the same time. The contractor will inform Vinh Thanh town and Vinh Quang CPC the construction schedule and scope in advance. The selection of material mines, borrow pit and dumping site for the subproject will also consider the demands from Vinh Thanh PR637 road project.	The CEMP and construction schedule will be prepared and approved prior to the construction work.
	Inundation at the current Ta Suc bridges and Suoi Xem bridge in Con river makes difficult for travelling in the flood season	Two new bridges will be constructed in Vinh Quang commune and Vinh Thanh district. The bridges are designed permanently with pre-stressed concrete, 12m width, designed load of HL93	
	Inadequate compensation will bring negative impacts to local people's lives	During the feasibility study phase, resettlement and land acquisition impacts are being prepared and a Resettlement and Ethnic Minority Development Plan prepared. Before construction starts, the REMDF will be updated and validated, and will provide for compensation and support of affected households as appropriate.	REMDP should be clearly reported and all land acquisition and compensation will be properly made and AHHs will be well supported prior to land handover to the construction contractor
Conclusion	The stakeholders consulted for the construction of the PR637 included representatives from Binh Dinh PPMU, Vinh Thanh DONRE, and DARD. Consultation has also been implemented with representatives from Vinh Quang CPC, Vinh Thanh town PC. Among 45 people have been consulted, 10 are women, make up 40%. Consultations took place in 24-25 April 2019. In general, all the relevant stakeholders support the implementation of the subproject. As		

Location and time	Comments/questions local authorities and	Responses from consultants	Address in the IEE/subproject
	the subproject located in the low population density and the main construction work will be based on the existing road foundation, no house must be relocated, except relatively major agricultural land acquisition will be taken, the local people totally support the subproject implementation.		

VI. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

114. This section of the report discusses the potential impacts of the project and recommends environmental mitigating measures to address adverse environmental impacts in following project phases; (i) preconstruction, (ii) construction, and (iii) operation of the rehabilitated road section.

115. The main issues will be (i) land clearing for the road; (ii) excavation of the road bases; and (iii) construction of the bridge, as minor impacts which can be addressed by conditions imposed within the Environmental Management Plan (EMP). No cultural or heritage sites will be affected nor will any natural forest be cleared.

A. Project Benefits

116. **Enhancing traffic safety and reducing climate risk.** The upgrading and expansion of the road section and construction of two replacement bridges will help improve the road quality and reduce traffic accidents. More importantly, the upgraded road and bridges with climate resilient capacity will significantly reduce the risk of the road flooding in extreme weather conditions and thereby significantly reduce the need for road closure during such weather conditions. Road safety provisions are embedded in the design including speed reduction rumble strips at the Vinh Thanh small town end point, widening of the carriageway with road markings, widening of bridge carriageway with adjacent footpaths for local use. Climate risks are to be mitigated through the well-considered design of climate resilience in road construction and appropriate technology.

117. **Socio-economic impacts.** The subproject will enhance the connectivity to the local population in general and the ethnic groups in particular by elevating the low section of the road and replacing bridges which are prone to waterlogging during rainy seasons. The improved access for difficult areas and disadvantaged groups will thereby raise their living quality and livelihoods. There are substantial risk reductions for local people dependent on the road during the wet season as well as the increased mobility for freight and passenger services that is expected to generate significant consumer and residential benefits in addition to the wider benefits from reduced transport costs.

B. Negative Impacts

118. Negative impacts may occur during the pre-construction phase, construction and operation phase.

119. During the pre-construction phase, the main impact associated with the project will occur from the acquisition of 3.6 ha of production land for the road widening and bridge construction, and UXO removal. Potential impacts and risks during construction include: (i) air pollution; (ii) excess noise and vibration; (iii) soil erosion and localized landslide; (iv) blocking natural drainage capacity; (v) improper solid waste disposal; (vi) pollution of streams and water courses; (vii) cultural conflicts between workers and local residents; (viii) inadequate material storage, handling; (ix) impact on transport on roads; (x) inadequate borrow pits management; (xi) inadequate disposal of unwanted excavated materials; and (xii) community and occupational health and safety concerns during construction, including exposure to COVID-19 and other communicable and infectious diseases.

120. In the operational phase, potential impacts are increased vehicular emissions and noise, traffic safety. Initial assessment of the impact of the subproject on carbon emissions indicates a

small net decrease due to consolidation of freight onto higher pay load trucks and reduced waiting times during periods of congestion.

1. Pre-construction Phase Activities

121. **Covid-19 health risk.** During this period activities are limited to site preparation for construction: pre-construction meeting with both officials and community leaders that address the contractors and project Health and Safety Plan with COVID-19 pandemic as a main feature. For COVID-19 the contractor will prepare a detailed COVID-19 Safety and Health Risk Management Plan that will be integrated with the CEMP.

122. **UXO clearance.** There are risks related to the UXO removal; however, these risks are associated with network extension alignments which are expected to be low probability as the alignments follow existing road right of ways. Workers and close houses might be impacted by UXO removal activities. UXO site clearances will be obtained following a specialized unit completing site assessments, this impact can be assessed as short-term and mitigatable.

123. **Loss of land and property.** The subproject design minimizes the encroachment on residential land and avoids historical and cultural relics such as communal houses, temples and shrines. The surveyed project area is mainly perennial land and crops cultivated by local people. The REMDP confirms that there are about 3.5 ha of land acquisition for the construction of the road.

Table 16: Permanent Land Area to be Acquired by the Project

TT	Permanently acquired land	Area (m ²)
1	Annual crop land	29,961
4	Land managed by CPCs	5,450
5	Residential land	451
Total		35,862

Source: xxx.

124. The REMDP¹⁹ did identify that the subproject will involve some removal of trees along the route, mainly some sections that go through production forest and other trees cultivated by people who live along the road. A total of 37,270m² of crop (26,175 m² of elephant grass and 11,095m² of corn) and 1,731 trees of various types which include 1,562 timber trees and 169 fruit trees along the route in the territory of Vinh Quang commune and Vinh Thanh town, Vinh Thanh district.

125. **Mitigation measure:** Compensation for land and assets will be dealt with in the REMDP that is also being prepared as part of the TRTA. The REMDP is prepared in accordance with the ADB SPS and national requirements and will be implemented by the District Resettlement and Compensation Committee. The compensation amount is estimated at VND 8.9 bn or US\$ 380,000.

126. The site clearance activities will create dust, noise and traffic impacts. The noise impacts caused by transport vehicles and construction machinery are assessed as moderate for the

¹⁹ The REMDP as a legal document is referred too for the details of the resettlement and ethnic minority development processes and procedures. The IEE should be read in conjunction with the REMDP as both have legal status.

workers directly involved in construction activities and moderate for some households living along the roadside. Initial calculation of pollutants and emissions in the exhaust gases and dust generated by the transport vehicles transporting the waste during the preparation of the construction site are many times lower than the permissible standard, so emissions impact during preparation is negligible.

2. Potential impacts and mitigation measures during the Construction Phase

127. The following activities will be undertaken during construction that will impact on the environment.

(a) Deterioration of Surface Water Quality

128. **Impacts:** Careless construction and poor handling of large amounts of filling soil (227,244 m³) at some road sections and the two bridge construction sites can cause significant adverse impacts such as blockages and release of silt to the Ta Suc and Xem streams, leading to siltation and reduced water quality that impact on cropped areas downstream, the rice fields near the Con river and Xem stream at Km11+565.46 (crossing Xem stream). Poor management of the filling soil could also increase the risk of erosion and blockage of the water flows at two streams, especially at the bridge construction site over the Xem stream (a tributary of Con River), where floods usually happen. Water flows could be temporarily blocked during pier installation for bridges over the Xem streams.

129. Surface water quality of the subproject area also could be degraded due to release of chemicals used in construction and sanitary wastes from worker-based camps that impact will mainly on water bodies along the subproject road and the workers' camp area, especially at the bridge construction sites over the Xem stream where floods usually happen.

130. **Mitigation measures:** The contractor will be required to implement measures to prevent erosion and sedimentation and prevent the discharge of wastewater from entering directly into natural and other water bodies, including:

- (i) Installation of silt fences, consisting of fine, flexible mesh firmly secure to the ground used as appropriate at the excavation sites for bridge abutments, especially on Xem stream banks to prevent silt release into these streams.
- (ii) Provision of adequate on-site sanitation facilities with septic containment and treatment facilities to prevent untreated sewage from being channeled into the drainage canals, irrigation canals, and river. The detailed measures will be provided in a Construction Camp Management Plan as part of the CEMP.
- (iii) Implementation of appropriate solid waste and construction waste collection and disposal area, with provision for waste segregation. The detailed measure will be provided in a Waste Management Plan as part of the CEMP.
- (iv) Designation of areas for equipment services, refueling, and wash down. The maintenance area should be provided with an impermeable surface and drainage that directs all runoff from the maintenance area through oil and grease traps to prevent oil from being washed into the offsite drainage canals. This will include an oil spill response plan. The detailed measure will be provided in a Hazardous Materials Management Plan as part of the CEMP.

(b) Increased Local Air Pollution, Noise

131. **Impacts:** The main sources of dust are from transport of a large amount of filling soil to the construction sites and earthworks e.g ground excavation and rock crushing. Construction machines and transport vehicles will generate gaseous emissions (NO_x SO_x, CO, CO₂, etc.). Bitumen activity will also generate gas and odor.. These gaseous emissions, dust and noise could cause respiratory and hearing problems for residents who live along the subproject road likes Vinh Quang commune and Vinh Thanh town, especially the sensitive receivers like Vinh Thanh primary school. Main noise sources are from project transport and construction machinery. No heavy machinery will be used on site that will cause significant vibration. Construction noise impact is considered minor, localized, and temporary as described in the pre-construction period.

132. **Mitigation measures:** The contractor will be responsible for ensuring that all vehicles and equipment are operated within their specifications to limit excessive release of air pollutants. Vehicles and equipment must be maintained to meet these specifications and any that produce excessive air pollution are to be stood down until they have been repaired.

133. Dust will be controlled by spraying water on roads going through villages and around the construction site on a daily basis. Warning signs, speed limit signs should be placed at the sites of sensitive receptors to reduce the transportation speed and reduce dust, gaseous emissions. Fugitive materials must be covered with tarpaulins when being transported by trucks. The contractor will be responsible for meeting these conditions and these shall be specified in the contract document. Air quality sampling integrated in the effect monitoring will be conducted by LIC to identify level of air pollution and effectiveness of contractor's performance in EMP implementation and formulation of corrective action if necessary.

134. The contractors should not locate any noise generating vehicles and machinery or large material storage site near residential areas or any of the sensitive socio-economic receptors listed in Table 14. The contractors will work with the 2 CPCs of Vinh Quang and Vinh Thanh town as well as Vinh Thanh DPC and the representative of ESP and PPMU; to identify areas for depots and agree on a materials transportation plan to be defined in the CEMP. PPMU and CSC will be responsible to monitor these mitigation measures.

135. Noise will be limited by the requirement to have appropriate vehicle and machinery standards and to ensure any significant excavation requiring concrete cutting etc. is carried out during daytime hours to minimize the impact. For the road sections near sensitive receptors including the Vinh Thanh Town Primary School and others as listed in Table 14, construction time shall be adjusted in consultation with the relevant CPC and the management of the sensitive receptor. Noisy activities shall in principle be limited to 8:00 – 11:00 in the morning and 1:30 – 4:30 in the afternoon.

(c) Impacts on Local Traffic

136. **Impacts:** Construction activities on the Subproject road are likely to cause hindrance in traffic flow if not mitigated properly especially when there is no other option for travelling. The subproject road runs along the cultivated areas and small hills where there are no alternative routes to access the commune center. The subproject road is also the access for primary students in Vinh Thanh town center and also there are several schools and kindergarten and their branches located roadside. Vinh Thanh town market located along the start point of the subproject road. Construction activities may constrain access and cause

difficulty for people during the construction phase. Local people and people from other areas who travel on the subproject road will be affected during 24 months construction period.

137. **Mitigation measures:** To minimize the disturbance to local people, the contractor will prepare and submit to the CSC a construction traffic plan as a part of the CEMP indicating the timing of vehicle journeys to avoid peak traffic hours. The contractor will also coordinate with local traffic authorities to implement appropriate traffic diversion schemes to maintain traffic flow during construction, set up clear traffic signal boards and traffic advisory signs at the start and end points of the road, at the T-junction with the road to Vinh Thanh town and at the sensitive locations like Vinh Thanh primary school, and Vinh Thanh town market. The contractor will also install bold diversion signs that would be clearly visible even at night and provide flag persons to warn of dangerous conditions. A traffic officer will be designated for each construction site.

138. Materials, goods and workers will be transported to and from the project site via the existing DR637 and local access roads such as inter-village roads. The frequent use of local dirt roads and partially concreted roads by heavy trucks will likely lead to quick degradation of the road. Therefore, the roads should be upgraded with filling of laterite on the road surface to meet the requirements of the project before and during the construction.

139. In the project area, some paths that are being used by people for farming will be reclaimed. This will limit travel of local people. The project will compensate with replacement roads where appropriate and necessary. Any damaged transport infrastructure caused by the construction activities will be repaired at the contractor's cost to at least the same standard and condition as it was before the project. The PPMU will ensure that this provision is included as an item in the contract and further stipulates that payment will be withheld from the contractor until the damage is repaired.

(d) **Safety of Local People or Construction Workers**

140. **Impacts:** Workers and the public are at risk of accidents associated with construction, particularly excavations, and operations involving heavy machinery. Material transport and construction activities on the existing road may create the risk of traffic safety and affect houses and other structures on roadsides, particularly on the sensitive receivers such as Vinh Thanh primary school, Vinh Thanh town center, and several residential areas along the road. The project construction also represents an increasing risk of transmitting COVID-19 into the subproject worksites and facilities or the adjacent communities through visitation or worker influx and through on-site transmission.

141. **Mitigation measures:** The civil works contractor will be required to develop a Community and Worker Safety and Health Plan (CSHP) that includes a specific section of the COVID-19 prevention and management plan that will be submitted by the contractor as part of the CEMP for approval by PPMU prior to commencement of construction. The CSHP shall incorporate good international practice, to be developed in close consultation with potentially affected communities and local authorities. The CSHP should include emergency response and preparedness procedures. The plan should include specific emergency response procedures, communication systems and protocols, interaction with local and regional emergency and health authorities, provision of emergency equipment and facilities such as fire truck, emergency service vehicles, and fire drills. The CSHP will include the provisions required under Government regulation and guidelines and the WHO workplace guidelines for the management and reporting of COVID-19. These guidelines are outlined above in the IEE and detailed requirements are specified within the EMP.

142. The contractors will also (i) conduct training for workers on safety, including roles and responsibilities, safe site practices and environmental hygiene (ii) institute site and camp rules such as wearing proper safety apparel such as safety boots, helmets, protective clothes, gloves and ear protection, (iii) ensure vehicle and plant operators are trained and licensed (iv) ensure all excavation sites are fenced with sign boards and perimeter markers and (v) allocate responsibility to supervisor staff to ensure that all safety rules are followed by all staff at all times. The project will take note of opinions and complaints from local people and authorities on safety.

143. The CHSP should also include the requirement for the erection of safety barriers either as tape or fencing as determined by the risk to prevent unauthorized access to construction areas. Warning signs around sites are to be printed clearly in Vietnamese language. This will be the responsibility of the contractor. The PPMU will be responsible for including these requirements in the contract documents.

(e) Impact from Influx of Construction Worker

144. **Impacts:** About 50-100 workers will be mobilized discontinuously in 24-month construction phase. The influx of construction worker can cause (i) a burden on local public services like electric and water supply; (ii) risk of transmission of diseases to the subproject area; (iii) conditions for great spread of diseases such as sore eyes, cholera, flu and respiratory problems; (iv) risks of social problems such as gambling, drug addiction, prostitution and violence. The impacts would be on both workers and on the communities near the construction sites in residential. Local workers will be encouraged to seek jobs on the project as part of boosting the local economy and minimizing the need for installing work camps. However, it is estimated that less than 60 workers will come from outside the area for skilled work associated with the bridge and road construction. There is requirement to construct one temporary camp. Social impacts from outside workers should also be considered with measures implemented to avoid the spread of STDs and avoid negative impacts on the local community and cultures. The contractor will be required to develop and implement a worker camp management plan as part of the CEMP.

145. **Mitigation measures:** (i) Careful siting of workers' camp and facilities as agreed by local communities and approved by the PPMU (ii) Registration of workers with local police while resident in the subproject area (iii) the workers' camps should be located in areas with sufficient drainage to avoid water logging and formation of breeding sites for mosquitoes and flies, (iv) workers' camps and other depots should be cleaned to ensure that site drainage continues to be effective (v) workers should have health checks before start work in the subproject and should be trained for living and working behavior before joining the sites (vi) engaging local people including for unskilled or semi-skilled tasks to the extent that they are able and willing to undertake them.

(f) Waste management

146. **Impact:** The construction activities will generate solid waste from construction site. The demolition of 2 old bridges will result in 2200m³ of construction waste for disposal. The project will not require the use of hazardous materials other than oil and petroleum during construction or operation. In terms of liquid waste, septic tanks will be installed to collect and treat domestic wastewater before being discharged to the local drainage system. Given the short duration of the construction phase, the impacts associated with domestic wastewater are not expected to be significant.

147. **Mitigation measures:** The Project will engage an oil supplier who will supply new oil for maintenance activities and collect/ transport used oil for disposal. It is estimated that about 100 kg of hazardous waste (HW) will be created yearly during the construction phase. This kind of waste will be handled and disposed of properly in accordance with Vietnamese regulations for HW. Details will be provided in the Waste Management Plan as part of the CEMP.

148. **Impacts on Local Infrastructure and Utilities.** The widening of the road and bridge construction have no impacts on any local irrigation canals, power transmission lines, telecommunication system. Some small connection roads may be impacted by transporting construction materials and construction waste. The impact is assessed as low, short term and mitigable.

3. Operation Phase

149. The subproject will bring major socio-economic positive impacts as it will increase traffic safety, reduce the time of road inundation and impact of flooding²⁰, connect local infrastructures, and rapid development of service and commerce activities for areas along the road. On the negative side, impacts and risks to physical and social-economic resources can be estimated as the contribution to negative impacts on soils, water quality, air quality, and noise.

150. **Impact on air quality:** The traffic projections in Table 2 above shows that without project, the number of vehicles traveling on the road will approximately double from 2019 to 2043. The share of motorcycles is projected to remain relatively constant at 75% of the total traffic. The traffic forecast also shows that with the project, total traffic (expressed in annual average daily traffic, AADT) is anticipated to slightly decrease as compared with the without-project scenario. The upgraded road will allow medium truck traffic in the without-project scenario to consolidate into fewer heavy trucks in the with-project scenario. As a result, incremental project-induced emissions such as greenhouse gases and other air pollutants, most importantly carbon monoxide (CO), nitrous oxide (NOx), Sulphur dioxide (SO₂), particulates (TSP), are not anticipated to significantly increase as a result of the project.

151. **Mitigation.** Strict access control for vehicles not complying with emission standards of Viet Nam (QCVN 05:2009/BGTVT) shall be enforced by the local traffic police. Sufficient annual O&M budget must be provided to ensure the road shall be regularly maintained to avoid accumulation of fine particles that could result in high dust levels. The Transportation Division of the District PC will plant trees along the road to partially mitigate air and noise impacts. Regular air quality monitoring will be conducted by the Provincial Department of Natural Resources and Environment (DONRE) during the operation period of the road.

152. **Noise:** Traffic generates noise. Noise levels depend upon four main sources: (i) vehicles, (ii) friction between vehicles and the road surface, (iii) driver behavior, and (iv) construction and maintenance activities. At the maximum designed speed (i.e. 60 km/h) traffic noise levels could exceed the allowed levels (55dB for day time and 45 dB for night time of IFC

²⁰ TRTA Road FS report July 2019: "according to the survey data, historical floods flooded residential areas, with an average depth of 0.9m to 1.5m (compared to the existing road surface). The length of the flooded section when there were historical floods is: Km11 + 500 - Km13 + 500, which is flooded due to the low embankment road with the scale of the overflow road. Historical floods occurred in 1985, 2013 and 2016 due to prolonged heavy rain and backwater from the Con river; Km11 + 500 - Km13 + 500 and Ta Suc and Suoi Xem bridges are flooded every year, section from Km 11 + 500 – Km 13 + 500 full embankment road, covered over low land area, often flooded in the rainy season. The site is organic soil, category 2;"

General EHS Guidelines: Environmental Noise Management), especially at Vinh Thanh Town Primary School located near the road. However, as explained above, traffic is not anticipated to increase as a result of the project. Total average daily traffic is projected to decrease, but the number of heavy trucks is projected to increase. This could result in a slight increase in traffic-induced noise; however, such increase is projected to be marginal. With exception of the Vinh Thanh Town Primary School, there are no sensitive receptors directly adjacent to the road. To minimize the impact, school area warning and speed limit signage (40 km/h) will be installed at that road section. No honking regulation will also be applied for the road section near the school area. Noise monitoring, including at this sensitive site, will be conducted during pre-construction and post-construction (early operation phase) to assess exact impact of the project on this sensitive receptor, and to identify additional noise control measures, as needed.

153. **Traffic safety.** The rehabilitation and widening of the project roads is likely to result in increased speed of traffic which may in turn increase the risk of traffic accidents. However, traffic safety in general is expected to significantly improve due to improved road conditions and clear signage. Routine safety measures, including signage and road markings will be provided to reduce traffic risks, especially in accident-prone areas. This impact will be low and can be mitigated.

VII. ANALYSIS OF ALTERNATIVES

154. Prior to the TRTA, lengthy discussions were held with respect to alternative alignments that bypassed the low-lying flood prone areas. These were rejected on the basis of (i) cost, (ii) road safety concerns from community members, and (iii) the potential increases in travel times for inter-district travel. As a result, it was decided to upgrade the existing road and to follow its current alignment.

155. During the design, alternative designs for both historical hydrological exceedance values P1 and P4 and for climate change projected values were undertaken. Preliminary designs, bill of quantities and cost estimates were prepared for both with the climate change adapted design incorporating higher road elevations, a revised bridge elevation and increased drainage apertures.

VIII. GRIEVANCE REDRESS MECHANISM

A. Type of Grievances

156. Any affected person (AP) can submit a grievance with Binh Dinh PPC/PPMU if they believe a practice is having a detrimental impact on the community, the environment, or on their quality of life. Grievances may include:

- (i) Negative impacts on a person or a community (e.g. health and safety issues, nuisances, etc.).
- (ii) Dangers to health and safety or the environment.
- (iii) Social impacts due to construction activities or impacts on social infrastructure.
- (iv) Failure to comply with standards or legal obligations.
- (v) Improper conduct or unethical behavior of Contractor leading to nuisance of affected person(s).

B. Grievance Redress Mechanism

157. A project grievance can be defined as an actual or perceived project-related problem

that gives ground for complaint by an affected person (AP). As a general policy, the EA (Binh Dinh PPC) and IA (PPMU) will work proactively to prevent grievances through the implementation of impact mitigation measures and community liaison activities that anticipate and address potential issues before they become grievances. Nonetheless, it is possible that unanticipated impacts may occur if the mitigation measures are not properly implemented or unforeseen issues occur.

158. To address complaints, a project grievance redress mechanism (GRM) will be established in accordance with ADB requirements and Government procedures. A GRM is a systematic process for receiving, recording, evaluating and addressing AP's project-related grievances transparently and in a reasonable period. The GRM will be established by the PPMU prior to the commencement of any land acquisition or resettlement activities, and will operate during the pre-construction, construction and operation phases.

159. The proposed GRM integrates resettlement, environment and technical issues into a single structure. The structure considers Vietnamese laws and provisions for complaint handling as well as nuances of the operating environment and cultural attitudes toward lodging complaints. Specifically, the structure enables the GRM to:

- (i) provide a predictable, transparent, and credible process to all parties, resulting in outcomes that are seen as fair, effective, and lasting;
- (ii) build trust as an integral component of broader community relations activities; and
- (iii) enable a systematic identification of issues or problems, facilitating corrective actions and pre-emptive engagement.

160. The proposed GRM includes the following elements:

- (i) a grievance receipt and registration system to provide ways for community members to register complaints and confirm they have been received;
- (ii) grievance eligibility assessment to determine if the issues raised in the complaint fall within the mandate of the GRM and if the complaints are legitimate;
- (iii) grievance assessment and investigation to clarify concerns raised in the complaint, to gather information on the situation, and to identify how the issues might be resolved;
- (iv) joint problem-solving, in which all relevant project stakeholders engage in a dialogue and action planning to resolve the problem; grievance tracking, including maintenance of written records of grievances, monitoring, public information disclosure and reporting to the affected people; and
- (v) grievance closure, including community feedback and confirmation of resolution of the problem.
- (vi) APs are entitled to lodge complaints regarding any aspect of affected environment, land acquisition and resettlement, such as noise, pollution, entitlements, rates and payment and procedures for resettlement, income restoration programs, etc.

161. The principles and procedures of the GRM are based on provisions of the:

- (i) Land Law No. 45/2013/QH13, dated 29/11/2013;
- (ii) Law on Grievances No. 02/2011/QH13, dated 11/11/2011;
- (iii) Law on Denunciations No. 03/2011/QH13, dated 11/11/2011;

- (iv) Law on Receiving of Residents No. 42/2013/QH13, dated 25/11/2013;
- (v) Decree No. 75/2012/ND-CP, dated 03/10/2012 of the Government Stipulating Detailed Regulations on Some Articles of Law on Grievance 2011;
- (vi) Decree No. 76/2012/ND-CP, dated 03/10/2012 of the Government Stipulating Detailed Regulations on Some Articles of Law on Denunciation 2011;
- (vii) Circular No. 06/2013/TT-TTCP, dated 30/9/2012 of the Government Inspectorate Stipulating Procedures of Denunciation Settlement,
- (viii) Circular No. 07/2014/TT-TTCP, dated 31/10/2014 of the Government Inspectorate Stipulating Procedures of Settling Grievances, Denunciating Letters and Letters of Requests;
- (ix) ADB's SPS (2009) and ADB's Public Communications Policy (2011).

162. According to the Land Law No. 45/2013/QH13, a grievance must be submitted within 90 days of the time they receive the decision of land acquisition or become aware of the actions of the administrative action in question. In circumstances, such as sickness, natural calamity, or required to work or study in a distant location or other objective constraints, that time will not be counted within the 90 days mentioned above.

163. The GRM consists of several escalating stages. Complaint resolution and decision making are undertaken by the PPMU in consultation with the District Grievance Redress Unit (DGRU) of Vinh Thanh District then by Binh Dinh Provincial Grievance Redress Committee (GRC), if required. The roles and responsibilities of the PPMU, DGRU and GRC are presented below.

164. **Environment and Social Unit of PPMU:** The PPMU Environmental Safeguards Officer (ESO), supported by other PPMU staff will (i) receive all complaints from APs seeking access to the GRM; (ii) register the complaints; (iii) determine complaint eligibility; (iv) send confirmation of eligibility to the complainant; (v) forward the complaint to relevant contractor (during construction) or facility operator (during operation), DGRU and GRU; (vi) follow up with the DGRU and the GRC on status of complaint redress; (vii) investigate the complaint and identify corrective actions that are within the mandate of Binh Dinh PPC; (viii) inform AP on the proposed corrective action; (ix) track and record all decisions taken; (x) maintain a complaint registration, tracking and monitoring system; and (xi) report to Binh Dinh PPC, Vinh Thanh District on the implementation and result of the corrective action plan.

165. **District Grievance Redress Unit (DGRU):** The Unit consists of 6 officers of six relevant District divisions: Center for Land Fund Development, Natural Resources and Environment, Inspectorate, Finance, Construction, and Resident Receiving Office. The Unit is chaired by the Vice Chairmen of Vinh Thanh District People's Committee. The DGRU will (i) determine eligibility of complaints relating to resettlement and environment, (ii) conduct an assessment of complaints that relate to resettlement and environment, (iii) send confirmation of eligibility to the AP in case the complaint is related to resettlement and environment, with copy to the PPMU; (iv) identify the corrective action plan and send it to the AP with copy to PPMU for further processing; (v) execute the plan and report the result of the plan implementation to PPMU; (vi) participate in GRC meetings if invited; (vii) monitor implementation of grievance resolution processes under their jurisdiction.

166. **The Grievance Redress Committees of Binh Dinh Province (GRC):** The Committee consists of 5 officers of five relevant provincial departments: Natural Resources and Environment, Inspectorate, Finance, Construction, and Resident Receiving Office. The Committee is chaired by the Vice Chairman of Binh Dinh PPC. The Committee will (i) determine

eligibility of appeals; (ii) conduct the assessment of appeals; (iii) send confirmation letter of eligibility to the AP with a copy to PPMU; (iv) identify corrective action plans for appeals; (v) manage and supervise the implementation of the plan; and (iv) inform PPMU on the decision of the corrective action plan.

167. The following are the steps for the GRM (Figure 9):

- (i) Stage 1: Submission of complaint.**
 - a. The AP submits a written complaint to PPMU as letter, or email (with attached signed letter). Contact details of PPMU ESO will be posted at the construction sites. A registered and legally recognized civil society organization (CSO) with valid representation authorization may file a complaint on behalf of an AP through the PPMU.
 - b. Complaints can also be sent directly to the works contractor (during construction through a hotline number that will be posted for construction-related matters (such as noise, dust, access to property and other matters) which require immediate action, or to the operator (during the operation phase). Contractors are required to register the complaint, and report to the PPMU on complaints received and actions taken.

- (ii) Stage 2: Registration, Eligibility Assessment, Confirmation of Eligibility [max. 5 working days]**
 - a. PPMU ESO registers the complaint in a grievance registry and identifies the nature of the complaint. If the complaint relates to resettlement (case 1), PPMU ESO forwards the complaint to the relevant DGRU for further processing. If the complaint relates to other matters such as environment, project design, damage to property or others (case 2), PPMU ESO proceeds to the next step.
 - b. The DGRU (case 1) or PPMU ESO (case 2) determines whether the complaint is eligible for the GRM using the screening procedure.
 - c. If the complaint is deemed ineligible, the complainant is informed of the decision and the reasons for ineligibility.
 - d. If the complaint is deemed eligible, the DGRU (case 1) or PPMU ESO (case 2) identifies how the complaints should be investigated and addressed and who will be responsible for these actions, and informs the relevant parties accordingly. Options include: (i) the works contractor (during construction phase); (ii) the operator (during operation phase); (iii) the Center for Land Fund Development; (iv) the DGRU; (iv) PPMU ESO; (v) others.
 - e. The DGRU (case 1) or PPMU ESO (case 2) sends a confirmation of eligibility to the complainant, with copy to PPMU ESO for case 1. The letter provides information on when a decision will be made regarding the complaint, and the main agency in charge of addressing the complaint.

- (iii) Stage 3: Assessment and Identification of Action [max. 10 working days]**
 - a. If the complaint is eligible, the entity identified under Stage 2(d) conducts an assessment and gathers information about the complaint to determine how it might be resolved.
 - b. If outside experts or technical information is needed, the entity identified under Stage 2(d) may seek such guidance and may request all parties

- concerned (including the complainant, as relevant) to participate in the grievance redress process.
- c. The entity identified under Stage 2 (d), in consultation with PPMU ESO, drafts a time-bound action plan including responsibilities for plan implementation.
 - d. The entity identified under Stage 2(d) submits the assessment letter including time-bound action plan to the complainant. PMU ESU is copied in the letter.
- (iv) Stage 4: Confirmation by AP, or First Appeal [max. 10 working days]**
- a. The complainant confirms in writing consent with the proposed action plan to execute immediately the action plan.
 - b. The complainant may submit an appeal to GRC of respective Provinces in the following cases: (i) no response is provided within 30 days after acknowledgement of the complaint; (ii) the complainant disagrees with the decision under Stage 3.
- (v) Stage 5: Review, Eligibility Assessment and Confirmation of Appeal by GRC of respective Provinces [max. 5 working days]**
- a. The GRC informs PPMU ESO/concerned DGRU that the complainant appealed the decision, and requests all relevant documents and issued decisions from PPMU ESO/concerned DGRU. The GRC, in consultation with the DGRU determines whether the appeal is eligible using their own screening procedure.
 - b. If the appeal is deemed ineligible, the complainant is informed of the decision and the reasons for ineligibility.
 - c. If the appeal is deemed eligible, the GRC identifies who and how the complaint should be investigated and addressed, and informs the relevant parties accordingly.
 - d. The GRC sends a confirmation of eligibility to the complainant with copy to PPMU ESO for registration. The letter provides information on when a decision will be made regarding the complaint, and the main agency in charge of addressing the complaint.
- (vi) Stage 6: Assessment and Identification of Action by GRC [max 10 working days]**
- a. If the complaint is eligible, the entity identified under Stage 5 (c) conducts an assessment and gathers information about the appeal to determine how it might be resolved.
 - b. If outside experts or technical information is needed, the entity identified under Stage 5 (c) may seek such guidance and may request all parties concerned (including the complainant, as relevant) to participate in the grievance redress process.
 - c. The entity identified under Stage 5 (c), in consultation with PPMU ESO, drafts a time-bound action plan including responsibilities for plan implementation.
 - d. The entity identified under Stage 5 (c) submits the assessment letter including time-bound action plan to the complainant. The DGRU and PPMU ESO are copied in the letter.
- (vii) Stage 7: Confirmation by AP, or Second Appeal [max 10 working days]**

- a. The complainant confirms agreement in writing with the Decision and the proposed action plan.
- b. The complainant may appeal to the local court in the following cases: (i) no response is provided within the 30 days after acknowledgement of the appeal; (ii) the complainant disagrees with the decision in Stage 6. In fact, at any time in the GRM the AP may appeal to the local court system if they so choose.
- c. If the AP is not satisfied with the outcome of the GRM, they may send their grievance directly to ADB's Southeast Asia Department (SERD) through ADB Viet Nam Resident Mission. If the AP is not satisfied with the responses of SERD, they can also directly contact the ADB's Office of the Special Project Facilitator.

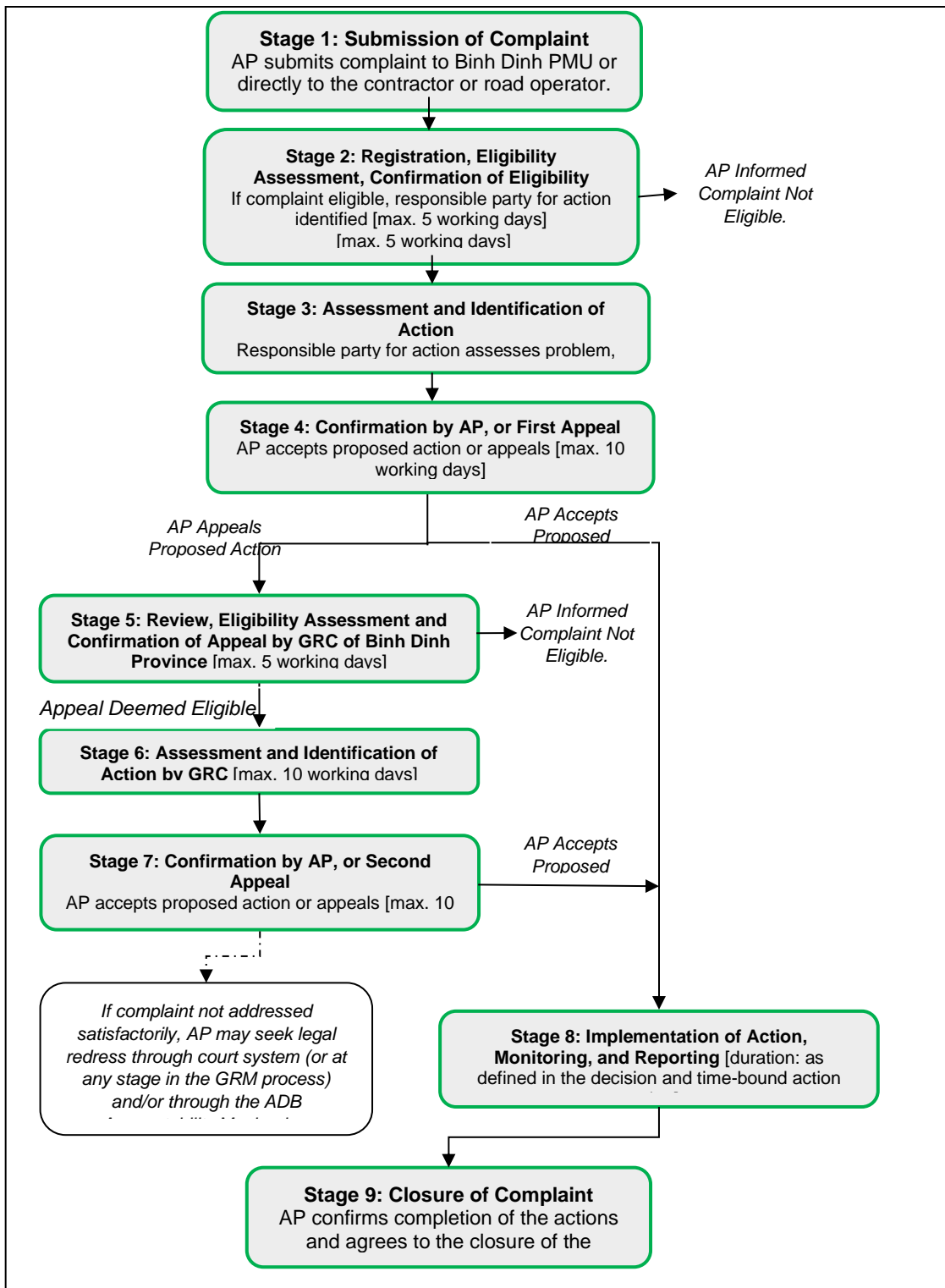
(viii) Stage 8: Implementation of Action, Monitoring, and Reporting [duration: as defined in the Decision and time-bound action plan]

- a. Implementation of the Decision and action plan commences, with close collaboration of relevant project stakeholders depending on the type of complaint.
- b. PPMU ESO monitors the implementation of actions and records findings, to be filed through the grievance administration system. As part of the monitoring process, PPMU ESO consults the relevant project stakeholders, as needed.

(ix) Stage 9: Closure of Complaint

- a. When the decision/actions are implemented and when monitoring is completed, PPMU ESO prepares a final report which is shared with the complainant, DGRU and GRC, and filed.
- b. The complainant confirms completion of the actions and *agrees* to the closure of the complaint. The grievance dossier is closed and filed in the project archive.

Figure 4: The Grievance Redress Mechanism



Source: xxx.

168. The AP will not have to pay any fee for his/her case (official or unofficial). APs will be encouraged to use the above GRM. However, the GRM does not impede access to the

country's judicial or administrative remedies by APs, at any stage, if they so wish.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Introduction

169. An EMP has been prepared for the subproject. The EMP integrates the results of the IEE into a formal plan for the implementing agency and Contractor to prevent or minimize potential environmental impacts. The EMP addresses the results of the public consultations on the Project that were convened as part of the IEE. The EMP consists of an Impacts Mitigation Plan, a Monitoring Plan and institutional responsibilities for the EMP.

170. The objectives of the environmental management plan are to address environmental protection issues that arise before, during and after the project, including the following:

- (i) Develop a management plan for the implementation of environmental mitigation measures throughout the project as approved by the PPMU.
- (ii) Describe the role and responsibilities of relevant organizations in environmental and social management.
- (iii) Describe the preventative and management of COVID-19 risks
- (iv) During detailed design, identify any changes to the project concept which may have environmental consequences and update the IEE.
- (v) As part of detailed design, carry out comprehensive audits of loss of assets based on the confirmed project scope and land acquisition requirements and assets pertaining to those lands.
- (vi) Ensure that all necessary environmental approvals have been obtained.
- (vii) Provide regular measurement of environmental quality during project implementation, to detect negative impacts on the environment and to propose measures to prevent and reduce environmental pollution according to the current regulations in Viet Nam.
- (viii) Provide a rapid response mechanism for environmental problems and incidents, and manage emergency resolution of environmental incidents
- (ix) Ensure that the project reaches an acceptable conclusion with no significant residual adverse environmental effects.

B. COVID-19 Risk and Response Management

171. The Project at the PPMU level and for all subproject implementation including contractors and visitor will follow the guidelines and directives of the Government of Viet Nam. Specific provisions for the prevention and management of COVID-19 risks are included in addition to public safety and occupational health and safety provisions within this Environmental Management Plan.

172. The successful contractor is required to develop a COVID-19 Safety and Health Risk Management Plan detailing actions to prevent transmission of COVID into project sites or adjacent communities and maintain site worker, visitor and adjacent communities safe through mitigating COVID-19 risks as well as a response plan should COVID-19 be suspected or identified. This will require reporting and confirmation of preventative measures and actions that are required by Government and agreed between the EA, the IA, local authorities with COVID mandates and contractors. The Construction Supervision Consultant will be contractually liable for ensuring all systems are operating and reported accurately.

C. Institutional Arrangements and Responsibilities

173. The Executing Agency (EA) is the Binh Dinh PPC, who established a Provincial Project Management Unit (PPMU) as the Implementing Agency (IA). The PPMU is responsible for carrying out the feasibility studies, detailed design, day-to-day management of sub-project implementation, and for arranging environmental assessment and monitoring and reporting during implementation of review of the subprojects. The PPMU has the ESO staffed with two environmental safeguards officer (ESOs who will be responsible for the preparation and implementation of environmental and social safeguards and who will have specific responsibilities for the monitoring, reporting and ensuring compliance oversight of COVID-19 requirements within the agreed COVID-19 Safety and Health Management Plan.

174. Following approval of the loan agreement, the PPMU will appoint a Loan Implementation consultant (LIC) to support subproject implementation in the province. The LIC will include an Environment Safeguard Specialist (ESS) who will support the PPMU to review and update the IEE/EMP based on the detailed designs, update the bidding documents in respect of environmental requirements and monitor the implementation of the subprojects. LIC will outsource recognized environment laboratory under LIC's contract to conduct sampling program including water, air and noise quality to support for environmental effect quality monitoring during the construction phase of the subproject. The ESS will be responsible for all COVID-19 management inputs and reporting.

175. A construction supervision consultant (CSC) will be contracted by the PPMU to daily supervise all construction activities, technical standards and construction progress of contractors and CEMP implementation. The CSC will be also responsible for ensuring all COVID – 19 monitoring data sets are up to date and accurate and will be contractual liable for all unreported shortfalls.

176. A summary of the environmental management responsibilities of the concerned parties during project implementation is provided in Table 18.

Table 18: Environmental Management Responsibilities of Concerned Parties

Organization	Environmental Management Responsibilities
PPMU (ESO)	<ul style="list-style-type: none"> • Complete ADB REA screening checklist for each subproject, confirm ADB/MONRE categorization and determine the need for IEE/EPP or IEE/EIAR. • Prepare IEE/EPP including EMP & submit to ADB for clearance and upload to ADB website and PPC/DONRE for endorsement. • Continue public consultation; disclose updated IEE to stakeholders. • Support LIC ESS update IEE & EMP during detailed design and obtain endorsement from PPC. • Ensure updated EMP is included in tender document with support from LIC. • Support CSC & LIC ESS in supervising and enforcing contractor's implementation of EMP/CEMP. • Review CSC monthly site environmental performance reports. • Review LIC quarterly EMP compliance reports. • Continue stakeholder consultation as part of GRM. • Prepare semi-annual monitoring reports to ADB/DPC and DONRE. • Prepare subproject environmental report indicating overall subproject environmental performance and CEMP compliance at completion of construction to ADB/DPC and DONRE
LIC (ESS)	<ul style="list-style-type: none"> • Update IEE & EMP during detailed design. • Support PPMU ESO to include updated EMP in tender document. • Review and approve contractors CEMP. • Provide support to PPMU ESMO and CSC in supervising contractors implementation

Organization	Environmental Management Responsibilities
	<p>of CEMP/EMP.</p> <ul style="list-style-type: none"> • Review CSC monthly site environmental performance reports and monitoring results. • Support PPMU ESO in stakeholder consultation as part of GRM. • Prepare quarterly EMP compliance reports to PPMU. • Recruit recognized environment laboratory under LIC contract to conduct sampling program including water, air and noise quality to support for environment effect monitoring. • Support PPMU ESO in preparing semi-annual monitoring reports for ADB clearance and upload to ADB website. • Support PPMU ESO prepare subproject environmental report indicating overall subproject environmental performance and CEMP compliance at completion of construction to ADB/DPC and DONRE.
CSC	<ul style="list-style-type: none"> • Supervise and monitor contractor's implementation of CEMP and GRM on daily basis. • Request contractor to undertake corrective actions in case of noncompliance with CEMP/EMP. • Prepare monthly site environmental performance reports to PPMU/LIC on compliance status of CEMP/EMP and monitoring results. • Compliance oversight of COVID preventative actions and management agreements monitoring and reporting.
Contractor	<ul style="list-style-type: none"> • Prepare bid including CEMP (based on EMP in tender document). • Appoint environmental and safety officer responsible for environmental management responsibilities of contract. • Prepare and implement approved CEMP/EMP including a COVID-19 Preventative Action and Risk Management Plan detailing actions, required monitoring and reporting systems • Act as local entry point for GRM. • Implement corrective actions as requested by CSC in case of noncompliance with CEMP/EMP. • Prepare monthly progress reports on status of CEMP implementation and GRM to CSC and PPMU.
DONRE	<ul style="list-style-type: none"> • Endorse IEE/EPP for each subproject. • Review PPMU semi-annual monitoring reports. • Review PPMU subproject environmental report at completion of construction. • Visit project site as needed; instruct PPMU and contractor on necessary corrective actions.
Provincial Department of Transportation/ Transport Division of District PC ;	<ul style="list-style-type: none"> • Responsible for EMP implementation in the operation phase, including environment monitoring • Allocate budget for subproject operation and maintenance (O&M), including budget for environment monitoring • Conduct periodic environment monitoring during project operation • Prepare periodic environment monitoring report to submit to DONRE/District PC to follow Decree 18/ND-CP • Submit environment monitoring report, for the first year of operation to ADB for review
ADB	<ul style="list-style-type: none"> • Review updated IEE and provide clearance and upload on ADB website. • Review semi-annual monitoring reports and upload to ADB website/ • Undertake periodic monitoring of the EMP implementation and due diligence as part of an overall project review mission. • If required, provide advice to PPMU in carrying out its responsibilities to implement the EMP for the project. • Review PPMU subproject environmental report at completion of construction.

Source: xxx.

D. Impact Mitigation Plan

177. In order to minimize adverse environmental impacts, several measures were proposed during the preparation stage of the Project. Surveys and design activities were conducted to

consider alternatives to minimize the Project's impacts during construction and operation stages. The following principles were adopted in devising the mitigation measures:

- (i) Disturbance to the life and transportation of the local people must be minimized.
- (ii) Proposed measures must be environmentally, socially and economically feasible.
- (iii) Technical standards and regulations must be complied with.
- (iv) Construction equipment and methods must be environment-friendly.
- (v) Monitoring activities must be conducted on a regular basis.

178. This section identifies mitigation measures for key impacts during the pre-construction construction and operation phases of the project. Given that most of these impacts will occur from civil works and transportation of construction/waste materials, many of the potential negative physical, biological, social and environmental impacts can be mitigated through implementation of standard mitigation measures typically associated with good engineering practice. They include measures to mitigate and manage noise, dust, water pollution, waste and community and occupational health and safety risks, etc. The required construction and operation phase mitigation measures are summarized in Table 19.

Table 19: Environmental Impact Mitigation Plan

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
Pre-Construction, Detailed Design Phase								
Confirmation of required resettlement, relocations, & compensation	Impact on the communities	1. Affected persons well informed ahead of project implementation	In all subproject area	Before subproject start	In the REMDP monitoring report	In the REMDP	PPMU ²²	Resettlement committees
Disclosure Information	No impacts	2. Implement information disclosure and activate grievance redress mechanism (in the IEE)	In all subproject area	When the subproject starts	Quarterly	No marginal cost ²³	PPMU	PPMU ²⁴
GoV approvals	No impact	3. Required project permits and certificates obtained	In all subproject area	Before construction start	N/A	No extra cost	DARD office of Vinh Thanh DPC	PPMU
Detailed designs	Minimize potential negative impacts	4. Complete detail design: - Minimal acquisition of agricultural or other land. - Avoided or minimal disruption to public services like water supply, drainage, electricity with plan for unavoidable situation.	In all subproject area	Before construction start	Once with detail designs	No extra cost	DARD office of Vinh Thanh DPC	PPMU
Updating Environmental Management Plan	Minimize potential negative impacts	5. Complete detail design, including uEMP with screened potential impacts, mitigation measures and monitoring requirements.	In all subproject area	Before detail design finalization	Once with detail designs	No extra cost	DARD office of Vinh Thanh DPC	PPMU Contractors
Develop bidding documents	No impacts	6. Ensure the EMP is included in tender documents for contractors so they could develop Construction Environmental Management Plan (CEMP).	N/A	Before construction starts	Once for all tenders	No extra cost	DARD office of Vinh Thanh DPC	PPMU, LIC

²¹ Costs need to be updated during detailed design phase

²² Binh Dinh Project Management Unit of Construction Investment Works for Agriculture and Rural Development

²³ No marginal cost indicates that costs to implement mitigation are to be built into cost estimates of bids of contractors

²⁴ Binh Dinh Project Management Unit of Construction Investment Works for Agriculture and Rural Development

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
		7. Specify in bid documents that contractor must have experience with implementing EMPs and provide staff for EMP implementation.						
Training and capacity building	No impacts	8. Develop training program for PPMU and staff for EMP implementation and manage contractor mitigation measures application. 9. Raising awareness and work with contractors for CEMP. 10. Conduct Workforce COVID-19 briefing with officials of mandated agencies and community Leaders	N/A	Before construction starts	After each training session	No extra cost	PPMU	ESS LIC
Procurement of Contractors	No impacts	11. Ensure the contract with contractors including CEMP developed from the reference's Environmental Management Plan	N/A	During contract signing period	Once	No extra cost	N/A	ESO
Recruitment of construction workers	Conflicts; social evils; transmits diseases	12. Recruit local workers as much as possible.	All construction location	Throughout construction phase	After worker recruitment step	No extra cost	PPMU	Contractor
CEMP	Minimize potential negative site specific impacts	13. Contractors to submit CEMP with potential impacts to ADB for review. The CEMP shall include separate plans as follows: a) Erosion and Sedimentation Control Plan, b) Construction Camp Management Plan, c) Air pollution, dust and noise management plan, d) Waste Management Plan, e) Hazardous Materials Management Plan, f) Traffic Management Plan, g) Community and Worker Safety and Health Plan (CSHP) h) Emergency Response Plan i) Environment monitoring plan	All construction location	Throughout construction phase	After worker recruitment step	No extra cost	PPMU, LIC	Contractor

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
		j) Cultural resources protection plan,						
UXO clearance	Minimize impacts from UXO and UXO clearing activities to local community, animal and workers	14. A clearing plan is developed by a specialized military unit in accordance with current regulations.	All construction location	Before construction starts	Once	No extra cost	PPMU	UXO clearance
Construction Phase								
Site establishment	Aid/ minimize impacts	15. Comply with requirements of Binh Dinh DONRE for use of construction equipment, hazardous waste, and chemical management. Establish stations for controlling and monitoring workforce and site visitors for COVID temperature monitoring and symptomatic screening of all staff, workers and site visitors including transport and equipment operators	All construction sites	At construction start	Once	No extra cost	PPMU	Contractor
Training and capacity building	Aid/ minimize impacts through training	16. Implement training program for PPMU (ESO), and contractors	PPMU offices, Construction site	Construction start period	After each activity	No extra cost	N/A	Environment Specialist (ESP) under Loan Implementation Consultant (LIC)
Worker camp operation	Pollution and social problem	17. Site the workers' camp away from local residential areas 18. Ensure adequate housing including hygiene facilities (water; waste disposal services and facilities; drainage system) 19. Prohibit guns and weapons in the camps 20. Raise awareness on disease transmission, local regulations to aid conflict. 21. Camp areas must be restored to	All worker camps	Throughout construction phase	Monthly	No extra cost	PPMU; Construction Supervision Consultant (CSC)	Contractor

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
		<p>original conditions upon completion of construction</p> <p>22. Develop entry management systems to prevent symptomatic cases entering sites, provide sanitization stations, and ensure social distancing is adhered to.</p> <p>23. Ensure sufficient space for shift-based separation at on-site congregation points such as site offices, mess lounges etc.</p> <p>24. Establish campsite based COVID-19 temperature and person movement tracing</p>						
Civil works	Degradation of forest and plantation area	<p>25. Locate construction sites away from agricultural areas as much as possible</p> <p>26. No trees cut down out of the plan for construction</p> <p>27. Hazardous substances such as oils, fuels should be stored and handled far from forest and plantation areas.28.. Waste should not be dumped in the forests or agricultural areas.</p>	Throughout construction areas	Throughout construction phase	Monthly	No extra cost	PPMU	Contractor
Civil works	Degradation of water quality and aquatic resources	<p>29. Reuse excavated material as filling soil as much as possible.</p> <p>30. Use silt fences, consisting of fine, flexible mesh firmly secure to the ground at the excavation sites for bridge abutments</p> <p>31. Locate material and temporary excavated soil stockpiles at least 20m far from water bodies (Ta Suc and Xem streams).</p> <p>32. Create sedimentation ditches around material stockpiles to contain rain-induced erosion.</p> <p>33. Conduct earthworks in the dry periods.</p> <p>34. Liquid materials like oils, fuels and paints should be stored and handled at</p>	Throughout construction areas	Throughout construction phase	Monthly	No extra cost	PPMU	Contractor

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
		<p>least 50m far from water bodies.</p> <p>35. No washing and maintenance works of machinery within 50m of water bodies.</p> <p>36. Toilet should be installed far away from water bodies.</p>						
Material exploitation and transportation	Pollution, safety risks, increase traffics, block access	<p>37. Inform Vinh Thanh Town and Vinh Quang CPC for the material exploitation plan and construction plan in advance.</p> <p>38. All borrow pits and quarries should have certificates from DONRE.</p> <p>39. Borrow pits and quarries should be fenced with warning signs to keep public away.</p> <p>40. After exploitation complete, borrow pits and quarries should be dewatered, fenced permanently with warning signs to keep public away.</p> <p>41. Transportation trucks must be covered with canvas.</p> <p>42. Restrict material transportation in the rush hours (7 - 8 am; 17h - 18h)</p>	Throughout construction areas	Throughout construction phase	Monthly	No extra cost	PPMU	Contractor
Excavation soil management	Contamination of land and surface waters by the excavated soil	<p>43. Surplus soil must be disposed at the designated sites as agreed with local authorities and Binh Dinh DONRE. The disposal site must be far away from residential area and large water bodies such as the Kon River.</p> <p>44. Where possible, surplus soil should be used at other construction sites, or disposed in the old quarries, borrow pits.</p> <p>45. Information (type, estimated volume, source...) of the disposed surplus soil must be recorded.</p> <p>46. Temporary surplus soil must be stored in high place with impervious ground and cover with tarpaulin and far from residential areas and water bodies.</p>	All excavation areas	Throughout construction phase	Monthly	No extra cost	PPMU	Contractor
Solid	Contamination	47. Management of solid waste and	All	Throughout	Monthly	No extra	PPMU	Contractor

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
construction waste and wastewater	of land and surface waters by construction waste	wastewater follow Government regulations and will cover collection, handling, transport, recycling and disposal of waste and wastewater. 48. Disposal sites should be determined by or approved by DONRE 49. Install enough trash bins at the construction sites (large one for the construction site) 50. Recyclable waste should be separated and sold to buyers in the community. Hazardous waste 51. Handling of hazardous waste such as used oil or gasoline containers or batteries must follow Government regulations. 52. Different hazardous types (hydrocarbons, paints, batteries, organic solvents) must be separated and stored in the areas with impervious ground and roof covers.	construction areas and worker camps	construction phase		cost		
Noise, vibration and dust generation	Dust, noise, vibration	53. Spray water, to control dust from material stockpiles, and exposed soil surfaces especially near sensitive receivers. 54. Cover and keep wet material at all stockpiles that contain fine material (not required where material is coarse and not transported by wind). 55. Minimize time that excavations and exposed soils are left exposed. Backfill as soon as possible	All construction areas	Throughout construction phase	Monthly	No extra cost	PPMU	Contractor
Disruption of public services	Stop or disruption of public services such as water electricity supply and drainage	56. Set up weekly and daily work plans for locations where outages in utilities and services may occur and inform the public 57. Work with public services management companies for the construction schedule and scale to	All construction areas	Throughout construction phase	Monthly	No extra cost	PPMU, Town and Commune	Contractor

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
		<p>minimize the duration of services disruption.</p> <p>58. Inform local authorities and local people of Vinh Thanh Town and Vinh Quang CPC for the construction plan and scope.</p>						
Land and soil erosion control and sediment Control	Soil erosion, and Risks from local flooding	<p>59. Conduct earthworks in the dry seasons.</p> <p>60. Maintain a stockpile of topsoil for immediate site restoration following backfilling.</p> <p>601. Re-vegetation all soil exposure areas as soon as possible.</p> <p>62. Provide adequate short-term drainage away from construction sites to prevent ponding and flooding.</p> <p>63. Install temporary storm drains or ditches for construction sites.</p> <p>64. Frequently clear the flow at the construction site to limit blockage capacity.</p> <p>65. Clean construction material at the site, cover materials that are easily dissipated by the wind in so that they are not swept away with the water flow, causing water flow block and flooding at the site</p>	All construction areas	Throughout construction phase	Monthly	No extra cost	PPMU, LIC & CSC	Contractor
Workers and public safety	Local people and worker could be hurt or injured. Local people and worker health	<p>66. Install fences and warning signs at all the construction sites.</p> <p>67. Provide sufficient information, disclosure at Vinh Thanh Town and Vinh Quang CPC and An Lao District subproject information. Assign guards at nighttime for all construction sites.</p> <p>68. Stagnant water should be filled into aid disease vector breeding.</p> <p>69. The contractor should guide and train workers on work safety and construction hazards before workers start working.</p>	All construction areas	Throughout construction phase	Monthly	No extra cost	PPMU, CSC	Contractor

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
		<p>70. Provide workers with full protective gears such as helmet, safety boots, protection clothes, masks, gloves and train them in proper use.</p> <p>71. Provide Medical cabinet with sufficient medicines and fire extinguishers at all construction sites.</p> <p>72. Assign person in charge for Health, Safety and Environment (HSE) at each construction site and send this person to the training course organized by the subproject.</p> <p>73. Supervise and check all construction sites daily to ensure potential hazards are removed or identified and marked</p>						
Occupational safety and Health – including COVID-19 response	Individual health risks including hospitalization, and mortality, rapid transmission through work site and community transmission	<p>74. Develop and implement COVID-19 plan (as part of Community and Worker Safety and Health Plan (CSHP):</p> <ul style="list-style-type: none"> -Monitor all individuals entering site facilities, work camps, works areas etc. to monitor symptoms and temperature prior to entry - Department of Public Health of the Province shall be officially notified about the implementation schedule of the works by PPMU. - Record keeping locations of workers who had visited/lived before and during work implementation. - Provision and mandatory use of personal protective equipment such as provision of hand washing stations, hand sanitizers – use of PPE such as facemasks will be applied only following detailed training in the use of masks and how these are disposed of. - Regularly and thoroughly clean hands with an alcohol-based hand containing at least 70 percent alcohol. - Regularly perform disinfecting/cleaning 	All construction sites and construction offices	Fulltime	Monthly with the exception of identified cases that are to be reported immediately to site managers and mandated public health officials	No extra cost	Contractor/ ESS. And CSC	Contractor

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
		<p>meeting rooms, offices, yards, stores and camps.</p> <ul style="list-style-type: none"> - Daily body temperature checks and other health checks on the work site/camp/office/store for all workers and site visitors with records of individuals retained to ensure traceability. - Avoid touching eyes, nose and mouth. Hands touch many surfaces and can pick up viruses. Once contaminated, hands can transfer the virus to eyes, nose or mouth. From there, the virus can enter body and infect. - Keep up to date on the latest information from trusted sources, such as the National Taskforce Committee for COVID-19 Prevention and Control, and other relevant local health authorities such as COVID-19 operation center of the province. Local and national authorities are best placed to advise on what people in area should be doing to protect. - Make sure, and the people around, follow good respiratory hygiene. This means covering mouth and nose with bent elbow or tissue when cough or sneeze. Then dispose of the used tissue immediately and wash hands. Droplets spread virus. By following good respiratory hygiene, protect the people around from viruses such as cold, flu and COVID-19. - Stay home and self-isolate even with minor symptoms such as cough, headache, mild fever, until recover. Have someone bring you supplies. If need to leave house, wear a mask to avoid infecting others. Avoiding contact with others will protect them from possible COVID-19 and other viruses. 						

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
		<ul style="list-style-type: none"> - Conduct information and education campaign. - Take procedures in accordance with the guidance of the National Taskforce Committee for COVID-19 Prevention and Control in the event any worker is suspected to have contracted COVID-19. - Provide a self-isolation option for symptomatic individuals until they can be moved off site for testing, all suspected cases are to be prohibited from site access for 14 symptom free days after diagnosis and ideally with confirmatory testing - With residential campsite ensure dedicated space is provided for isolation of any suspected COVID-19 cases and individuals with comparative symptoms 						
Construction and local traffic	Traffic disruption, traffic jam and block; accident	<p>75. Schedule construction vehicle activity during light traffic periods. Install sufficient signage and warning lights at all construction sites.</p> <p>76. Inform local authorities and local people construction schedule and scope in advance.</p>	All construction areas	Throughout construction phase	Monthly	No extra cost	PPMU	Contractor
Air pollution, construction noise	- Dust from the excavation, ground leveling Impacts caused by dust and emission gases from material transportation vehicles Impacts from dust and gases emitted from construction	<p>77. On hot and dry days, regular watering on the site transportation routes and on the construction site as needed to reduce dust especially in populated areas.</p> <p>78. Cover or keep moist all stockpiles of construction aggregates, and all truckloads of aggregates.</p> <p>79. Minimize time that excavations and exposed soil are left open/exposed. Backfill immediately after work completed.</p> <p>80. Restrict working time between 17:00</p>	All construction sites	Fulltime	Monthly	No marginal cost	LIC and CSC	Contractor

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
	machines and equipment Noise, vibrant from construction machines and tools.	and 7:00 especially for activities such as pile driving. - Maintain equipment in proper working order - Replace unnecessarily noisy vehicles and machinery. - Vehicles and machinery to be turned off when not in use. - Construct temporary noise barriers around excessively noisy activity areas where possible especially where located close to sensitive receptors.						
Cultural resources protection plan	Damage to cultural property or values, and chance finds	81. Chance finds of valued relics and cultural values should be anticipated by contractors. Site supervisors should be on the watch for finds. 82. Upon a chance find all work to stop immediately, find left untouched, and PPMU notified to determine if find is valuable. Culture section of Binh Dinh Department of Culture, Sports and Tourism (DCST) notified by telephone if valuable. Work at find site will remain stopped until DCST allows work to continue.	All construction sites	At the start, and throughout construction	Monthly	No marginal cost	LIC & CSC	Contractor
Operation Phase								
Operation of the Vinh Thanh Road PR637	Increase the risks of traffic accidents due to increased numbers of vehicles on the new road	83. Arrangement of warning signs, instruction signs at intersection locations. 85. Limit speed when required. 84. Arrangement of transport staff for regular investigation of the roads for exceeding- permitted speed cases and non- compliance cases of traffic regulations	Along the road	Full time	Annually	O&M	Binh Dinh Department of Transportation	
	Dust, emission, noise of traffic vehicles on the road	85. Sufficient annual O&M budget must be provided to ensure all equipment stays in good working condition. 68.Regular sanitation on the road 87.Planting trees along the road		Full time			Binh Dinh Department of Transportation	

Component	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost ²¹ (USD)	Responsibility	
							Supervised by	Implemented by
		88. Implement air quality monitoring regularly 89. installation of warning and speed limit signages (40 km/h) at the intersection with Vinh Thanh Town Primary School						

Source: xxx.

E. Environmental Monitoring Plan

179. The environmental safeguard monitoring with associated grievance redress mechanism is undertaken by the construction supervision consultant (CSC) and the ESS of the LIC team during construction phase and by Provincial Department of Transportation/ Transport Division of District PC during the operation phase, to ensure that the required policies and procedures and plans for minimization of negative environmental impacts are implemented. The environmental monitoring program in terms of environmental effects monitoring and environmental compliance monitoring has been developed in table 20.

180. Environmental effect monitoring is carried out by the LIC, though outsourcing recognized environment laboratory for conduct sampling program including air, water and noise quality, to examine impacts of the subproject in relation to ambient environmental conditions..

181. Environmental compliance monitoring is carried out by CSC and LIC to review compliance with operating procedures and technical standards and/or contractor specifications in the EMP and approved CEMP e.g. safety during construction, construction worker camp sanitation and hygiene conditions, wastes including hazardous disposal practices during construction, erosion control including the COVID-19 Safety and health Risk Management Plan etc.

**Table 20: Scope of Environmental Monitoring During Construction Phase
(to be implemented by the LIC)**

No.	Monitoring items	Construction phase	Operation phase	Applied standard
I	Ambient noise/vibration monitoring			
	1.Parameter	Leq, L50, Lmax	Leq, L50, Lmax	QCVN 26/2010/BTNMT IFC Guidelines
	2.Frequency	Prior to construction; In response to community complaints	Every 3 months	
	3.Monitoring position	Baseline environmental locations should be established at boundary of construction sites, and at sensitive receptors (residential area in Vinh Thanh Town). At a minimum, the monitoring locations shall include: Location 1: Starting point of the road section near Ta Suc Industrial Cluster Location 2: Suoi Xem Bridge - near Dinh Binh village center Location 3: End point of the road section near Dinh Binh bridge Location 4: Vinh Thanh Town Primary School		
II	Ambient air quality monitoring			
	1.Parameter	TSP, CO, NO2, SO2, HC, microclimate	TSP, CO, NO2, SO2, HC	QCVN 05 :2013/BTNMT, QCVN 06:2009/BTNMT
	2.Frequency	Prior to construction; In response to community complaints	Every 3 months	

	3. Monitoring position	Baseline environmental locations should be established at boundary of construction sites, and at sensitive receptors (residential area in Vinh Thanh Town). At a minimum, the monitoring locations shall include: Location 1: Starting point of the road section Location 2: Suoi Xem Bridge Location 3: End point of the road section Location 4: Vinh Thanh Town Primary School		
III	Surface water/wastewater quality monitoring			
	1. Parameter	pH, temperature, DO, TSS, T- N, T-P, BOD5, COD, oil and grease, Coliform	pH, temperature, DO, TSS, BOD5, COD, DO, oil and grease, Coliform	QCVN 08:2008/BTNMT; QCVN 14:2008/BTNMT; QCVN 24:2009/BTNMT
	2. Frequency	Prior to construction; Every 3 months In response to community complaints	Every 3 months	
	3. Monitoring position	At water bodies along the road. At a minimum, the monitoring locations shall include: Suoi Xem and Ta Suc Bridge		

Source: xxx.

182. Non-compliance with these standards will be highlighted in the monitoring reports. Monitoring results will be submitted by the PMU through the semi-annual environmental monitoring reports.

Table 21: Proposed Compliance Monitoring Plan for Vinh Thanh Road Subproject

Environmental issues	Location	Methodology	Frequency	Monitoring Responsibility	
				Implementation	Supervision
Pre-Construction Phase					
1. Detailed design completed, accounting for requirements defined in the EMP, Table 19.	Throughout subproject area	Review documents	Once	Detailed Design Consultant	PPMU, EA, ADB
2. EMP updated and submitted to ADB for clearance and disclosure	Throughout subproject area	Review documents	Once	PPMU, EA	ADB
3. COVID – 19 Safety and Health risk Management Plan approved	Throughout subproject area	Prior Review by PPMU	Once	PPMU, ADB	EA
3. EMP incorporated into tender documents	Throughout subproject area	Review documents	Once	PPMU, EA, Procurement Department	EA, ADB
4. Check for and removal of remaining unexploded ordnance from wars	Throughout subproject area	Using of special equipment	Once	Local military forces	EA

Environmental issues	Location	Methodology	Frequency	Monitoring Responsibility	
				Implementation	Supervision
5. CSC contracted by EA, with adequate resources for EMP implementation coordination support.	EA office	Confirmation by EA	Once	EA	ADB
6. Construction EMPs (CEMPs) prepared by contractors and cleared by CSC and PMU	All Works contracts	Review documents	Once for each works contract	CSC	PMU, EA, ADB
7. PMU has assigned full-time environment staff to coordinate EMP implementation	PPMU office	Confirmation by PPMU	Once	PPMU	EA, ADB
8. Contractors have assigned one full-time environment and safety officer (ESO) and one full-time construction safety engineer prior to commencement of works	Works contracts	Confirmation by contractors	Once for each contractor	CSC	PMU, ADB
9. ESS under LIC contracted by EA to conduct verification of EMP implementation	EA office	Confirmation by EA	Once	EA	ADB
10. Grievance Redress Mechanism is established, with clearly identified entry points, procedures and timeframes. The GRM is disclosed to potentially affected people	PMU office	Confirmation by PPMU	Once	PPMU	EA, ADB,
11. Pre-construction monitoring conducted in accordance with the environmental effect monitoring plan defined in this EMP	At monitoring sites identified in the monitoring plan	Monitoring results provided by CSC	Once	LIC	PPMU,
Construction Phase					
1. EMP and CEMP implemented properly	Subproject area	Site inspections based on measures defined in the EMP	Weekly	CSC/LIC	PPMU, DONRE
2. Grievance Redress Mechanism is operational and functioning, complaints are redressed in accordance with the GRM.	PMU office, DONRE,	GRM Register	Semi-annually	CSC/LIC	PPMU, LIC
3. Relevant permits are secured (batching plants, spoil disposal	Construction sites, batching plants, spoil	Records of Works contractors	Once	CSC/LIC	PPMU

Environmental issues	Location	Methodology	Frequency	Monitoring Responsibility	
				Implementation	Supervision
sites, work camps, others as relevant)	disposal sites				
Sites are secured and well maintained	Construction sites, batching plants, spoil disposal sites	Site observations	Weekly	CSC/LIC	PPMU, , DOLISA, DONRE
Construction safety complies with Vietnamese regulations, accidents are investigated and reported	Construction sites, batching plants, spoil disposal sites	Site observations	Weekly	CSC/LIC	PPMU, , DOLISA, DONRE
COVID-19 Systems operated in compliance with EMP requirement	Site entry and exist points, Camp sites Public Awareness	Daily monitoring of temperature Work site social distancing provision	Daily	Daily Contractor ESC and CSC	PPMU
Information disclosure and public consultation is conducted in accordance with the consultation plan	Construction sites	Site observations, monitoring reports	Weekly, semi-annual	CSC	PPMU
Environmental and safety personnel are present on site	Construction sites	Site observations	Weekly	CSC	PPMU
Spoil disposal sites are clearly delineated and well managed	Spoil disposal sites	Site observations	Monthly	CSC	PPMU
Reporting by contractors is timely and covers CEMP implementation	N.A.	Monthly progress reports by contractors	Monthly	CSC	PPMU
Non-compliances (such as excessive noise and dust at construction site boundaries, inappropriate disposal of spoil and waste, etc.) are redressed by the contractors.	Construction sites, along transportation routes	Site observations	Weekly	CSC	PPMU
Dust suppression (e.g. sprinkling water)	Construction sites, along	Site observations	Weekly	CSC	PPMU
Reporting by contractors is timely and covers CEMP implementation	N.A.	Monthly progress reports by contractors	Monthly	CSC	PPMU
Non-compliances (such as excessive noise and dust at construction site boundaries, inappropriate disposal of spoil and waste, etc.) are redressed by the contractors.	Construction sites, along transportation routes	Site observations	Weekly	CSC	PMU
Dust suppression (e.g.	Construction	Site	Weekly	CSC	PMU

Environmental issues	Location	Methodology	Frequency	Monitoring Responsibility	
				Implementation	Supervision
sprinkling water on existing road and construction site) is implemented	sites, along transportation routes	observations			
Temporary noise barriers at sensitive areas are installed.	Sensitive areas	Site observations	Weekly	CSC	PMU
Sanitary conditions at work camp (water supply, toilets, management and treatment of wastes)	Worker-based camps	Site observations	Weekly	CSC	PMU
Health care (e.g. periodic health examinations, communicable diseases, first aid, and medical stations on-site)	Worker-based camps, construction sites	Site observations, informal interviews	Weekly	CSC	PMU
Social problems associated with labor force (e.g. strife, alcohol and drug abuse, gamble, etc.)	Worker-based camps, construction sites	Site observations, informal interviews	Weekly	CSC	PMU
Maintenance of water flows (e.g., rivers, irrigation canals, and drainages)	Along all affected rivers and canals	Observation	Weekly	CSC	PMU
Maintenance of local roads used for transporting wastes and materials	Throughout subproject area	Observation	Weekly	CSC	PMU
Plan for prevention of fire and explosion	Storage areas	Observation	Weekly	CSC	PMU
Emergency response plan is in place	Storage areas	Observation	Weekly	CSC	PMU
Traffic safety (e.g. signboards, lighting systems, speed limits, and instruction manuals)	Intersections	Observation	Weekly	CSC	PMU
Operation Phase					
A follow-up monitoring plan for noise and air quality is in place	Locations identified during construction and operation phases	Observation and interviews	Once every three months	DOT	EA/ DONRE/ DOT
Traffic safety and emergency response system is in place	Along all new and upgraded roads	Observation and interviews	Once every three months	DOT	EA/ DONRE/ DOT

Source: xxx.

F. Reporting

183. EMP monitoring and reporting requirements are summarized in Table 22.

Table 22: Environment reporting System

Project Phase	Type of Report	Frequency	Responsibility	Submitted To Whom
Construction	Site Environmental Performance Report indicating compliance with CEMP and monitoring results (Checklist)	Monthly	CSC	LIC/PPMU
	EMP Compliance Report indicating compliance with all subproject's CEMPs and monitoring results	Quarterly	LIC	PPMU
	Environment Monitoring Report indicating compliance with all subproject's CEMPs and monitoring results	Minimum bi-annually, or twice during construction if construction duration is shorter than 1 year	PPMU	ADB/DPC and DONRE
	Subproject Environmental Report indicating overall subproject environmental performance and CEMP compliance	At completion of subproject	PPMU	ADB/DPC and DONRE
	COVID -19 Safety and Health Risk Management Plan Reporting	Symptomatic Individuals within 1 hour of diagnosis Weekly reports from site office to contractor CC to PPMU Monthly reports with overall statistics	Contractor	ESS /PPMU CSC/PPMU
Operation	EMP Compliance Report: Operation indicating compliance with subproject EMP commitments during operation	Once per year for first two years of operation. Ongoing frequency to be determined based on review after 2 years.	DOT and/or Operating Company	ADB

Source: xxx.

184. PPMU report on environmental performance/compliance of the Project should be included in the progress report submitted to the CPC before each project implementation support mission and must include sufficient information on: i) preparation and disclosures of environmental safeguards instruments for Projects; ii) incorporation of new Project EMP in the

bidding and contractual documents; iii) monitoring and supervision of EMP implementation by the contractor, the construction supervision engineer, and the PCs; iv) any challenges in safeguard implementation, solutions, and lessons learned.

G. Estimated Cost of EMP

185. The cost of implementing the EMP includes (i) Contracting of environmental expert within the LIC (24 person months input to this subproject spread over 24 months) (ii) environmental monitoring site samples and testing costs \$1,200. The total cost excluding CEMP cost that included in the construction contract, is expected to be \$11,900.

X. CONCLUSIONS

186. The IEE report has reviewed the environmental impacts associated with the project and has developed a comprehensive EMP that when properly implemented will reduce the environmental impacts of the project to acceptable levels. The EMP outlines potential environmental impacts, mitigation measures, monitoring responsibilities and institutional requirements to implement the EMP.

187. During the pre-construction phase, the main impact associated with the project will occur from the acquisition of 3.5 ha of production land for the road widening and bridge construction. No houses within the Right of Way (RoW) will be required to be removed. Pre-construction requirements include payment of land compensation which is addressed in a separate RP for this project.

188. Construction impacts are concentrated along the road and at bridge sites. The project requires an earthwork of about 227,244m³. Typical construction impacts such as noise, dust, vibration, emissions, reduced water quality, waste generation, traffic impacts and other social impacts are expected. No natural forests, protected areas or any cultural or heritage object are encroached upon by the road widening.

189. All impacts can be mitigated to acceptable standards through implementation of mitigation measures specified in the EMP. Local communities will be encouraged to seek work on the project and a mechanism has been introduced into the EMP to advise the local communities of possible opportunities by a series of planned awareness meetings. During construction the contractor will be responsible for implementing the EMP as per his construction environmental management plan (CEMP) approved by PPMU prior to construction commencing. A construction supervision consultant shall supervise day to day compliance of the contractor to the CEMP, supported by a Loan Implementation Consultant. During the post-construction phase, typical impacts include emissions, noise and road safety. The cost of the EMP is estimated at about \$2,980.

190. Initial community consultation meetings were held by the PPMU with assistance from consultants to discuss the alignment of road and their impacts. Public consultations were held in offices of Vinh Thanh Commune, Vinh Quang Town and Vinh Thanh District from 24-25 April 2019. Consultations were held with participation of authorities while the affected households will be consulted in follow on meetings. The project received strong endorsement from the local authorities.

191. About 3.5 ha of land is needed for widening the road and 35,862 m² of land will be permanently acquired for construction. Most of the land is currently crop farming land and production forest land. There are 71 households and 2 Communal People's Committee that will

be affected by the construction and operation of the project. No resettlement is needed for the construction of the project. The compensation and support policies and mechanisms for the project is addressed in detail in a separate Resettlement Plan.

192. The project is classified as high climate risk. A climate risk and vulnerability assessment (CRVA) has been prepared by the CRVA Consultant. The detailed design consultant will be required to apply projected climate data as the basis for the detailed design. The integration of climate change impacts has been included in the preliminary designs resulting in changes to road and bridge elevations and increase apertures of drainage provisions. The incremental cost of climate change within the design is estimated at 1.6 to 2.0% of capital investment.

193. The total project cost is estimated at \$5.7 million. Implementation of the project is expected to commence in 2021 and the operation of the new road and bridges is expected to commence in 2022.

194. The IEE concludes that the benefits of the proposed project outweigh the potential impacts and that adverse environmental impacts arising from the construction and operation of the rehabilitated road and bridges can be addressed by the EMP and reduced to acceptable levels. Therefore, a full EIA is not necessary.

APPENDIX 1: REFERENCES CITED

1. ADB, 2003, Environmental Assessment Guidelines of the Asian Development Bank.
2. ADB, 2009. Safeguard Policy Statement, ADB Policy Paper.
3. ADB, 2012, Environmental Safeguards, A Good Practice Sourcebook, Draft.
4. ADB, 2019, IBAT Proximity Report for Vinh Thanh Road Subproject. Climate Resilient Inclusive Infrastructure for Ethnic Minorities Project (CRIEM) in the South Central Coastal Provinces (SCCP)
5. Binh Dinh Provincial Biodiversity Conservation Masterplan to 2025, orientation to 2030, 2017.
6. Binh Dinh Water Resources Masterplan to 2035, 2018.
7. Vinh Thanh District 2017, Statistical Yearbook.
8. Vinh Thanh District Socio-Economic Review Report, 2018.

APPENDIX 2: VINH THANH ROAD SUBPROJECT DESIGN STANDARDS

A. Alignment Study and Identification of Upgrading Requirements

1. The proposed road section will be constructed in which:
 - (i) Uses to the extent possible the existing alignment.
 - (ii) From Km 11 + 300 - km 12 + 485 the road follows the old road passing Dinh Quang Hamlet Vinh Quang commune, the status is an asphalt pavement, average width 5.5 m - 6.0 m, roadbed is 6.0m - 6.5m wide, the road surface has been deteriorated.
 - (iii) From Km12 + 485 - Km13 + 327, this section belongs to Suoi Xem Bridge, the alignment will adjust to the east of the existing to minimize use of agricultural land and ensure the technical parameters of the road design category (category IV plain TCVN 4054-05), whilst ensuring traffic circulation during the construction period..
 - (iv) From Km 13 + 327 - km 13 + 665 the road follows the old road passing the territory of Quarter 5, Vinh Thanh town, the status is asphalt pavement, average width 5.5 m - 6.0 m. The roadbed is 6.0m - 6.5m wide, currently the road surface has been deteriorated.
 - (v) Bridges: There are currently three bridges on the road section: (i) Ta Suc I bridge (Station: Km 11 + 565.76) is reinforced concrete girder bridge L = 10m, Bm = 6.0m, (ii) Ta Suc II Bridge (Station: Km 11 + 547.96) is 17.5m RC plate girder bridge, Bm = 6m, and (iii) Suoi Xem overflow bridge (Station: Km 12 + 736.55) with length L = 168.52 m. At present, these 3 bridges have been seriously degraded with exploited load of H13, on the road and all three bridges in the rainy season, often flooded by water levels of Song Con and Suoi Xem rising from 0.5 to 1.5m high.
 - (vi) Culvert works: On the road, there are 3 old culverts with aperture from 0.6 to 1.0m. In general, the apertures of these culverts are too small with inability to support the required drainage flow, and are degraded.

2. Based on the calculated traffic volume (PCU) for future years and the condition of the road proposed to upgrade and expand on scale of road category IV plain (TCVN 4054-2005) and the bridge structures to Cat III plains with specifications as in Table A2.1.

Table A2.1: Design Standards

Parameter	Standard (TCVN 4054-2005)
Road Category IV (plains) specification	
Designed speed	60 km/hr.
Road Base Width	9.0 m
Pavement Width	8.0 m
Sidewalk Width	2 x 0.5m
Bridges – Category III (Plains)	
Road Base width	12.0 m
Pavement Width	11.0 m
Sidewalk Width	2 x 0.5m

B. Structures

1. Bridges

3. The existing bridges being: (i) the Ta Suc I Bridge at Km11+553.31; (ii) the Ta Suc II bridge at Km Km11+700; and (iii) the Suoi Xem Overflow Bridge at Km12+736.55 will be replaced. The two bridges over the Ta Suc river will be replaced by a single structure.

4. The existing Ta Suc I Bridge is a 10m RC T-girder bridge, and the Ta Suc II bridge is a 17.5m RC plate girder bridge. Both of these bridges are deemed small bridges and have a technical specification based on P4 hydrological conditions, designed for a 25-year recurrence interval. The Suoi Xem Bridge, a pre-stressed concrete (PSC) composite bridge, is 177.45m long, and is a P1 category bridge, designed for a 100-year recurrence interval see Table A2.2.

Table A2.2: Existing Bridges

No.	Bridge /Station	Existing bridges		
		Bridge type / Aperture	Length (m)	Structure
1	Ta Suc Bridge Km11+565.46 (crossing stream)	RC T-girder / B=6.5m	1x9.0 (10)	RC T-girder
		RC plate girder / B=6.5m	2x8.0 (17.5)	RC plate girder
2	Suoi Xem Bridge Km12+736.55 (Crossing Xem Stream)	RC T-Girder / B=(5-:-6.5)m	14x12 (177.45)	RC T-Girder

5. In addition to the bridges there are three culverts that are insufficiently sized for the current water flows, and in some road sections there are also longitudinal ditches. The drainage design follows typical design standards set by the Ministry of Transport based on P4 exceedance frequency (historical data): minimum of 3 culverts per km with design pipe culverts range in diameter from 0.75 to 1.5 m, and box/slab culverts at 1 m height. The drainage design spacing and slope also comply with MoT's design standards: culvert headwalls and foundation will be of stone masonry, and side ditches will be of trapezoidal cross-section 0.4 m deep and 1.2 m wide at the top. The latter are lined with mortar riprap, and feature a 30-cm vertical lip on cliff sides to prevent eroded soil from falling directly into the ditch and silting up the culverts.

6. Significant flooding is already affecting the road sub-project. The current design criteria for design flow and runoff parameters (based on catchment area) do not adequately represent future climate conditions.

7. The work proposed under TRTA 8957 will, based on climate adjusted design parameters, upgrade the road to a Category IV (plain) road, replace the two Ta Suc bridges with a single bridge and replace the Xem Bridge. All bridges will be to P1 hydrological conditions inclusive of climate change.

Table A2.3: Proposed Bridge Upgrading

Bridge/Station	Proposed	
	Bridge Type/Aperture	Length (m)
Ta Suc Bridge Km11+565.46 (Crossing Stream)	RC plate girder DU'L/B=12.0m	2x18.0 (50.15)
Suoi Xem Bridge Km12+736.55 (Crossing Xem Stream)	RC I-Girder DU'L/B=12.0m	6x33.0 (212.35)

2. Drainage

8. Drainage on the road uses conventional reinforced concrete, designed according to the process of 22TCN 18-79, design load H30-BX80, design frequency of P4%, scale according to the designed road base.

9. Bridges on the road were permanently constructed with reinforced concrete; Design standards according to 22 TCN272-05; Design load: Live load HL93, pedestrian 30Mpa; Design frequency of big bridge and medium bridge $P = 1\%$; Bridge size (Bridge width): $B = 0.5 + 11 + 0.5 = 12.0\text{m}$.

APPENDIX 3: MINUTES OF PUBLIC CONSULTATIONS

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập – Tự do – Hạnh phúc

Thị trấn Vĩnh Thuận ngày 25 tháng 4 năm 2019

TRTA-8957.VIE: DỰ ÁN XÂY DỰNG CƠ SỞ HẠ TẦNG THÍCH ỨNG BIẾN ĐỔI KHÍ HẬU CHO ĐỒNG BÀO DÂN TỘC THIỂU SỐ TẠI 5 TỈNH NAM TRUNG BỘ (CRIEM)

BIÊN BẢN LÀM VIỆC Về Chính sách an toàn Môi trường

I. Thành phần tham dự:

- | | |
|-------------------------------------|--|
| - Ông/Bà <i>Đỗ Xuân Quang</i> | Chức vụ..... <i>Chủ tịch Hội Bảo Vệ Môi Trường - UBND TT</i> |
| - Ông/Bà <i>Trần Minh</i> | Chức vụ..... <i>Chuyên gia môi trường - TRTA</i> |
| - Ông/Bà <i>Lê Văn Thanh</i> | Chức vụ..... <i>Chủ tịch Ban Địa</i> |
| - Ông/Bà <i>Nguyễn Đức Cường</i> | Chức vụ..... <i>Chuyên gia thiết kế đường</i> |
| - Ông/Bà <i>Đông Thị Thu Hương</i> | Chức vụ..... <i>Chuyên gia hồ sơ</i> |
| - Ông/Bà..... | Chức vụ..... |
| Ông/Bà..... | Chức vụ..... |
- Đại diện những hộ bị ảnh hưởng: người.

(Xem danh sách đại biểu tham dự đính kèm)

II. Nội dung

2.1 Các nội dung phổ biến thông tin:

- Cung cấp các thông tin về dự án như mục tiêu, địa điểm, quy mô, các thông số kỹ thuật cơ bản của các tuyến đường giao thông và tiểu dự án cấp nước sinh hoạt.
- Phổ biến thông tin về phạm vi Chính sách an toàn môi trường ADB và Chính phủ Việt Nam.

2.2 Tham vấn cộng đồng:

- Tham vấn về các vấn đề môi trường, tác động môi trường tiềm tàng của Dự án bao gồm tác động lên môi trường tự nhiên và xã hội; các biện pháp giảm thiểu đề xuất giảm thiểu tác động tiêu cực;
- Tham vấn về quy hoạch, diện tích rừng, thiên tai, tình hình đa dạng sinh học của các khu bảo tồn, khu dự trữ sinh quyển trên địa bàn...
- Họp tham vấn công bố thông tin dự án và thu thập số liệu về môi trường, biến đổi khí hậu, xã thái, bãi chôn lấp... của khu vực dự án.
- Tham vấn về nhu cầu hỗ trợ và đào tạo liên quan đến môi trường;
- Thu thập các ý kiến khác liên quan đến chính sách an toàn môi trường.

III. Ý kiến thảo luận

III.1. Các vấn đề chính sách an toàn môi trường

Chính quyền địa phương là cơ bản thống nhất với chủ trương đầu tư năng cấp tuyến đường đồng ý với ý kiến hướng tuyến đường an ninh cấp tuyến đường và chủ trương bố trí đầu tư từ ngân hàng A.D.B sẽ góp phần phát triển kinh tế địa phương, tạo việc làm về môi trường trong quá trình khai thác.

III.2. Các vấn đề về tác động tiềm tàng và biện pháp giảm thiểu

- Chủ đầu tư sẽ chú trọng công tác an toàn giao thông khi có nhiều xe tải chuyển qua các km dài có đông người đi xe máy, hướng đến chất lượng công trình.
- Khi thi công cần kết nối các biện pháp bảo vệ môi trường trong quá trình thi công để giảm ô nhiễm tiếng ồn.
- Chủ đầu tư sẽ chú trọng công tác an toàn về tích tụ công nhân chính quyền và người dân địa phương, đảm bảo thi công đúng tiến độ.

III. Kết luận

Chính quyền và người dân địa phương đồng ý
với chủ trương xây dựng huyện đường đồng ý
về cấu trúc công kiến trúc và các biện pháp
giảm thiểu ô nhiễm môi trường.

Cuộc họp các bên thống nhất và kết thúc vào lúc ngày 25 tháng 4 năm 2019

Đại diện cộng đồng

Đại diện chính quyền địa phương



CHỦ TỊCH

Đỗ Xuân Quang

BQL Tiêu dự án

Đại diện Tư vấn

Trần Minh

DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP

Xã/phường... Hội An, Vĩnh Thạnh..... Tỉnh/thành phố... Bình Định.....

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên
1.	Đỗ Xuân Quang	Nam	Chủ tịch UBND	<i>Đỗ Xuân Quang</i>
2.	Nguyễn Tường Sơn	Nam	Phó chủ tịch UBND	<i>Nguyễn Tường Sơn</i>
3.	Phạm Thanh Bình	Nam	Hội trưởng hội đồng	<i>Phạm Thanh Bình</i>
4.	Vương Thị Cờ	Nữ	Chủ tịch Hội phụ nữ	<i>Vương Thị Cờ</i>
5.	Mai Khánh Linh	Nam	Cán bộ địa chính	<i>Mai Khánh Linh</i>
6.	Nguyễn Văn An	Nam	Trưởng ĐB HĐND	<i>Nguyễn Văn An</i>
7.	Nguyễn Văn	Nam	Trưởng Khu phố	<i>Nguyễn Văn</i>
8.	Nguyễn Thanh Tân	Nam	Khu phố Bình An	<i>Nguyễn Thanh Tân</i>
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DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP THAM VẤN MÔI TRƯỜNG

Xã/phường: Thị trấn Vĩnh Thạnh, Huyện Vĩnh Thạnh,tỉnh Bình Định

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên
1.	Đinh Văn Chuyên	Nam	Khu phố Long Sơn - VT	Chuyên
2.	Đinh Văn Hưng	Nam	"	Hưng
3.	Đinh Văn Hải	Nam	"	Hải
4.	Đinh Thị H'May	Nữ	"	H'May
5.	Đinh Thị Pla'	Nữ	"	Pla'
6.	Đinh Lăng	Nam	"	Lăng
7.	Đinh Văn Lập	Nam	"	Lập
8.	Le Thị Hiền	Nam	"	Huân
9.	Đỗ Ngọc Mai	Nữ	Khu phố Bình Bình - VT	Mai
10.	Nguyễn Thanh Tùng	Nam	"	Tùng
11.	Le Văn Hoa	Nam	"	Hoa
12.	Nguyễn Thị Rừng	Nữ	"	Rừng
13.	Nguyễn Thị Hải	Nữ	"	Hải
14.	Le Thị Bông	Nữ	"	Bông
15.	Nguyễn Tân Chiến	Nam	"	Chiến

Ngày 25 /4/ 2019

Đại diện chính quyền địa phương



CHỦ TỊCH

Đỗ Xuân Quang

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

H. U. S. Thanh, ngày 25 tháng 4 năm 2019

TRTA-8957.VIE: DỰ ÁN XÂY DỰNG CƠ SỞ HẠ TẦNG THÍCH ỨNG BIẾN ĐỔI
KHÍ HẬU CHO ĐỒNG BẢO DÂN TỘC THIỂU SỐ TẠI 5 TỈNH NAM TRUNG BỘ
(CRIEM)

BIÊN BẢN LÀM VIỆC
Về Chính sách an toàn Môi trường

I. Thành phần tham dự:

- Ông/Bà... Nguyễn Hữu Xuân,	Chức vụ... Trưởng phòng FA.MI. Huyện Vĩnh Thạnh
- Ông/Bà... Trần Văn Anh,	Chức vụ... Chuyên viên môi trường
- Ông/Bà... Nguyễn Văn Sơn,	Chức vụ... Trưởng phòng AN.S.P.T.M.T
- Ông/Bà... Nguyễn Thế Ngộ,	Chức vụ... Hạt Kiểm Lâm
- Ông/Bà... Trần Công Quang,	Chức vụ... Phó phòng AN.S.P.T.M.T
- Ông/Bà... Võ Trọng Quý,	Chức vụ... Chuyên viên môi trường
Ông/Bà... Trần Minh,	Chức vụ... Chuyên gia môi trường - TRTA
Bà... Dương Thị Hương,	Chức vụ... Chuyên gia môi trường
- Đại diện những hộ bị ảnh hưởng.....	người

(Xem danh sách đại biểu tham dự đính kèm)

II. Nội dung

2.1 Các nội dung phổ biến thông tin:

- Cung cấp các thông tin về dự án như mục tiêu, địa điểm, quy mô, các thông số kỹ thuật cơ bản của các tuyến đường giao thông và tiêu dự án cấp nước sinh hoạt.
- Phổ biến thông tin về phạm vi Chính sách an toàn môi trường ADB và Chính phủ Việt Nam.

2.2 Tham vấn cộng đồng:

- Tham vấn về các vấn đề môi trường, tác động môi trường tiềm tàng của Dự án bao gồm tác động lên môi trường tự nhiên và xã hội; các biện pháp giảm thiểu đề xuất giảm thiểu tác động tiêu cực;
- Tham vấn về quy hoạch, diện tích rừng, thiên tai, tình hình đa dạng sinh học của các khu bảo tồn, khu dự trữ sinh quyển trên địa bàn...
- Hợp tham vấn công bố thông tin dự án và thu thập số liệu về môi trường, biến đổi khí hậu, xã thái, bãi chôn lấp... của khu vực dự án.
- Tham vấn về nhu cầu hỗ trợ và đào tạo liên quan đến môi trường;
- Thu thập các ý kiến khác liên quan đến chính sách an toàn môi trường.

III. Ý kiến thảo luận

III.1. Các vấn đề chính sách an toàn môi trường

- Thống nhất cơ sở về vị trí, phương án hướng tuyến, thiết kế cửa tuyến đường

- Dự án cần khắc phục vấn đề ngập nước cửa tuyến đường trong mùa mưa

- Dự án không ảnh hưởng đến hệ sinh thái tự nhiên cửa huyện và xã

III.2. Các vấn đề về tác động tiềm tàng và biện pháp giảm thiểu

- Việc thiết kế cửa huyện xử lý vấn đề ngập nước trong mùa mưa

- Thống nhất xây dựng và thiết kế có thể áp dụng cho các địa phương khác để nghiên cứu thực hiện các biện pháp bảo vệ môi trường trong quá trình chuẩn bị và thi công tuyến đường

- Thống nhất xây dựng và theo dõi các tác động tiềm tàng của dự án và chính quyền địa phương phối hợp

- Hợp ý kiến giữa các địa phương khi thi công ở khu vực sông, suối, hồ, ao, kênh, rạch, ruộng, rừng...

III. Kết luận

Chính quyền địa phương và người dân đồng ý với
chủ trương nâng cấp tuyến đường

Cuộc họp các bên thống nhất và kết thúc vào lúc ngày 25 tháng 4 năm 2019

Đại diện cộng đồng

Đại diện chính quyền địa phương

 **TRƯỞNG PHÒNG**
Nguyễn Hữu Xuân

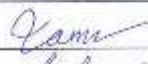

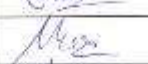



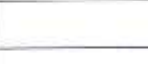
BQL Tiêu dự án

Đại diện Tư vấn

Trần Minh

DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP

Xã/phường... Huyện Vĩnh Thành..... Tỉnh/thành phố... Bình Định.....

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên
1.	Nguyễn Thanh Tân	Nam	Khu phố Vĩnh Định	
2.	Nguyễn Kiên	Nam	Thường Khu phố	
3.	Le Thu Huyền	Nữ	Thôn Bình Lợi	
4.	Trần Thị Mai	Nữ	Thôn Bình Lợi	
5.	Võ Thị Tý	Nữ	Thôn Bình Lợi	
6.	Nguyễn Đình Tú	Nam	Thôn Bình Lợi	
7.	Cao Thanh Quý	Nam	Thôn Bình Lợi	
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DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP THAM VẤN MÔI TRƯỜNG

Huyện Vĩnh Thạnh; tỉnh Bình Định

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên
1.	Phan Văn Thát	Nam	Chu Đình An - Vĩ	THAT
2.	Phan Văn Sỹ	Nam	"	Sỹ
3.	Cao Văn An	Nam	"	An
4.	Nguyễn Thanh Tùng	Nam	"	Tùng
5.	Đặng Thị Hương	Nữ	"	Hương
6.	Huyền Thị Hương	Nữ	"	Hương
7.	Trần Ngọc Yến	Nam	"	Yến
8.	Lê Văn Bốn	Nam	"	Bốn
9.	Đỗ Cao Ly	Nam	"	Ly
10.	Nguyễn Thị Đào	Nữ	"	Đào
11.	Trương Thị Nguyệt Lai	Nữ	"	Lai
12.	Võ Thị Tý	Nữ	"	Tý
13.	Đặng Thị Mai	Nữ	"	Mai
14.	Nguyễn Đình Tú	Nam	"	Tú
15.	Nguyễn Anh	Nam	"	Anh

Ngày 25/4/2019

Đại diện chính quyền địa phương



TRƯỞNG PHÒNG

Nguyễn Hữu Tuấn

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập – Tự do – Hạnh phúc

Xã Vinh Quang, ngày 25 tháng 4 năm 2019

TRTA-8957.VIE: DỰ ÁN XÂY DỰNG CƠ SỞ HẠ TẦNG THÍCH ỨNG BIẾN ĐỔI KHÍ HẬU CHO ĐỒNG BẢO DÂN TỘC THIỂU SỐ TẠI 5 TỈNH NAM TRUNG BỘ (CRIEM)

BIÊN BẢN LÀM VIỆC
Về Chính sách an toàn Môi trường

I. Thành phần tham dự:

- | | |
|------------------------------|--------------------------------------|
| - Ông/Bà Nguyễn Phương Kiều | Chức vụ Chủ tịch UBND xã Vinh Quang |
| - Ông/Bà Trần Mạnh | Chức vụ Chuyên gia môi trường - TRTA |
| - Ông/Bà Lê Văn Sinh | Chức vụ Phó Giám đốc Đ. P. |
| - Ông/Bà Nguyễn Đức Cường | Chức vụ Chuyên gia thiết kế đường |
| - Ông/Bà Dương Thị Thu Hương | Chức vụ Chuyên gia hồ sơ |
| - Ông/Bà | Chức vụ |
| Ông/Bà | Chức vụ |
- Đại diện những hộ bị ảnh hưởng: người.

(Xem danh sách đại biểu tham dự đính kèm)

II. Nội dung

2.1 Các nội dung phổ biến thông tin:

- Cung cấp các thông tin về dự án như mục tiêu, địa điểm, quy mô, các thông số kỹ thuật cơ bản của các tuyến đường giao thông và tiểu dự án cấp nước sinh hoạt.
- Phổ biến thông tin về phạm vi Chính sách an toàn môi trường ADB và Chính phủ Việt Nam.

2.2 Tham vấn cộng đồng:

- Tham vấn về các vấn đề môi trường, tác động môi trường tiềm tàng của Dự án bao gồm tác động lên môi trường tự nhiên và xã hội; các biện pháp giảm thiểu đề xuất giảm thiểu tác động tiêu cực;
- Tham vấn về quy hoạch, diện tích rừng, thiên tai, tình hình đa dạng sinh học của các khu bảo tồn, khu dự trữ sinh quyển trên địa bàn...
- Họp tham vấn công bố thông tin dự án và thu thập số liệu về môi trường, biến đổi khí hậu, xã hội, bãi chôn lấp... của khu vực dự án.
- Tham vấn về nhu cầu hỗ trợ và đào tạo liên quan đến môi trường;
- Thu thập các ý kiến khác liên quan đến chính sách an toàn môi trường.

III. Ý kiến thảo luận

III.1. Các vấn đề chính sách an toàn môi trường

- Chính quyền có đồng ý với chủ trương này cấp huyện/tỉnh, trợ cấp hoạt động rất quan trọng đối với phát triển kinh tế xã hội địa phương?
- Chủ trương cần cấp dụng cụ cho các chính sách môi trường của nhà nước và nhà tài trợ A.D.B. trong quá trình triển khai dự án.

III.2. Các vấn đề về tác động tiềm tàng và biện pháp giảm thiểu

- Lưu ý vấn đề ngập lụt tại thị trấn Tabac và các vùng lân cận trong quá trình thi công.
- Lưu ý vấn đề đến từ các trại chăn nuôi heo màu là thiết hại đối với người dân trong quá trình thu hoạch củ khoai tây. Đảm bảo quyền lợi cho người dân bị ảnh hưởng?
- Chú trọng và nhắc nhở nhân viên công nhân địa phương các biện pháp bảo vệ môi trường để giảm thiểu, bồi đắp rừng.
- Không làm ảnh hưởng đến đất đai của kinh doanh.
- Đảm bảo thời gian thi công đúng cam kết. Thông báo đầy đủ cho chính quyền địa phương và người dân về lịch trình thi công.

III. Kết luận

Chính quyền xã và người dân nhất trí với
đơn t/hg của đồng chí ... đồng ý với các tác động
hỗ trợ địa phương và các biện pháp giảm thiểu
môi trường, tự vẫn chấp hành.

Cuộc họp các bên thống nhất và kết thúc vào lúcngày.....tháng.....năm 2019

Đại diện cộng đồng

Đại diện chính quyền địa phương



BQL Tiểu dự án

Đại diện Tư vấn

[Handwritten signature]
Trần Minh



DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP

Xã/phường: Xã Vĩnh Quang, Tỉnh/thành phố: Hà Tĩnh

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên
1.	Nguyễn Phương Bắc	Nam	Cán bộ UBND xã	<i>[Signature]</i>
2.	Đặng Minh Thuận	Nam	Đoàn chính	<i>[Signature]</i>
3.	Tô Thanh Đăng	Nam	Văn phòng thông tin	<i>[Signature]</i>
4.	Phạm Thị Nga	Nữ	Phụ nữ thôn Đồi Bông	<i>[Signature]</i>
5.	Nguyễn Phi Quốc	Nam	Chủ tịch thôn NĐ	<i>[Signature]</i>
6.	Lê Thái Kiên	Nam	Chủ dân thôn Đồi Bông	<i>[Signature]</i>
7.	Hồ Văn Nhàn	Nam	Trưởng Lao ý tế	<i>[Signature]</i>
8.	Hồ Văn Nhàn	Nam	Chủ thôn Đồi Bông	<i>[Signature]</i>
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DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP THAM VẤN MÔI TRƯỜNG

Xã/phường: Vĩnh Quang, Huyện Vĩnh Thạnh, tỉnh Bình Định

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên
1.	Đinh Nhâm	Nam	Trường Khu Klotpol	<i>Mhah</i>
2.	Đinh Thị Hiền	Nữ	Khu Klotpol	<i>Hien</i>
3.	Trần Thị Mỹ Tâm	Nữ	"	<i>Mytam</i>
4.	Đinh Thị Hiền	Nữ	"	<i>Hien</i>
5.	Bùi Sỹ Kế	Nam	"	<i>Bui</i>
6.	Đinh Khương	Nam	"	<i>Khue</i>
7.	Đinh Philip	Nam	"	<i>Philip</i>
8.	Đinh Thị Thanh	Nữ	"	<i>Thanh</i>
9.	Trần Kim Ninh	Nam	Điện Bình Trường	<i>Ninh</i>
10.	Cao Thanh Quý	Nam	"	<i>Quy</i>
11.	Lê Thị Diệu	Nữ	"	<i>Diou</i>
12.	Đặng Thị Trà	Nữ	"	<i>Tran</i>
13.	Lê Thái Hưng	Nam	"	<i>Hung</i>
14.	Hồ Thanh Tiến	Nam	"	<i>Tien</i>
15.	Đỗ Văn Giờ	Nam	"	<i>Gioi</i>

Ngày 25/4/2013

Đại diện chính quyền địa phương



CHỖ CHỮ

Nguyễn Phương Bắc

APPENDIX 4: RAPID ENVIRONMENTAL ASSESSMENT OF PROJECT

Instructions:

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

Country/Project Title:

Viet Nam: Vinh Thanh Road Subproject - Climate Resilient Inclusive Infrastructure for Ethnic Minorities Project (CRIEM) in the South Central Coastal

Sector Division:

SEER and VRM, SERD

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		X	None is detected
▪ Protected Area		X	None is detected
▪ Wetland		X	None is detected
▪ Mangrove		X	None is detected
▪ Estuarine		X	None is detected
▪ Buffer zone of protected area		X	No. The site is about 30km from the buffer zone of Con Ka Kinh National Park
▪ Special area for protecting biodiversity		X	None is detected
B. Potential Environmental Impacts Will the Project cause...			
▪ encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?		X	There will be no such encroachment
▪ encroachment on precious ecosystem (e.g. sensitive or protected areas)?		X	There will be no such encroachment
▪ alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?		X	There will be no such alteration as no in-stream construction will be happened

Screening Questions	Yes	No	Remarks
▪ damage to sensitive coastal/marine habitats by construction of submarine cables?		X	The project in review includes inland infrastructure only
▪ deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?		X	Surface water impacts from camps and chemical usage in this project are predicted as minimal
▪ increased local air pollution due to rock crushing, cutting and filling?		X	Site construction does not engage rock exploiting
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?		X	Risks related to constructing bridges
▪ chemical pollution resulting from chemical clearing of vegetation for construction site?		X	No chemical will be used for devegetation
▪ noise and vibration due to blasting and other civil works?	X		Noise is anticipated during construction of the road and bridges as minor impact. There will be no blasting in this project.
▪ dislocation or involuntary resettlement of people?		X	No house will be relocated
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		X	No indigenous people will be adversely affected by the Project. Other impacts will be considered and mitigated properly in the EMP of the project
▪ social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?	X		Disturbances to communities living near the end of constructed road in Vinh Thanh Town. Anticipated as minor. The EMP will include mitigation measures for managing traffic caused by construction to prevent of minimize disturbance to regular traffic and local community
▪ hazardous driving conditions where construction interferes with pre-existing roads?	X		As above mitigation measures will be proposed in the EMP for Projects for managing construction truck traffic to prevent of minimize disturbance to regular traffic and local community
▪ creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?		X	There will be no such impact
▪ facilitation of access to protected areas in case corridors traverse protected areas?		X	The project makes use of existing roads as access road. No traversing projected areas.
▪ large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?		X	This impact is negligible. 01 temporary camp will be installed and EMP will have mitigation measures managing influx and activities of workers and controlling impact on local infrastructure.
▪ social conflicts if workers from other regions or countries are hired?		X	Use of local workers will be encouraged.
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	X		The EMP prescribe mitigation measures for solid and liquid waste management in temporary construction worker camps.

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> ▪ risks to community safety associated with maintenance of lines and related facilities? 	X		None.
<ul style="list-style-type: none"> ▪ community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization? 		X	None.
<ul style="list-style-type: none"> ▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation? 	X		Minimal risks if any. Information campaign will be provided to community prior to and during construction. EMP will have provisions to reduce or mitigate these impacts.

Checklist for Preliminary Climate Risk Screening

Country/Project Title: Viet Nam: Vinh Thanh Road Subproject - Climate Resilient Inclusive Infrastructure for Ethnic Minorities Project (CRIEM) in the South Central Coastal
Sector: Transport
Subsector: Road
Division/Department: SEER-VRM/SERD

Screening Questions		Score	Remarks ²⁵
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	1	
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?	1	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	1	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	1	
Performance of project outputs	Would weather/climate conditions and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	1	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

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

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

Other

Comments: _____

Prepared by: _____

²⁵ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

APPENDIX 5: PHOTOS OF THE PUBLIC CONSULTATIONS



Meeting and interviewing with Vinh Thanh town authorities



Meeting and interviewing with Vinh Thanh town authorities



Meeting and interviewing with Vinh Thanh district authorities



Meeting and interviewing with Vinh Thanh town local people



Meeting and interviewing with Vinh Thanh town local people



Meeting and interviewing with Vinh Thanh town local people



Meetings and Interviews and public consultations with Vinh Thanh town local people



Meetings and Interviews and public consultations with Vinh Thanh town local people

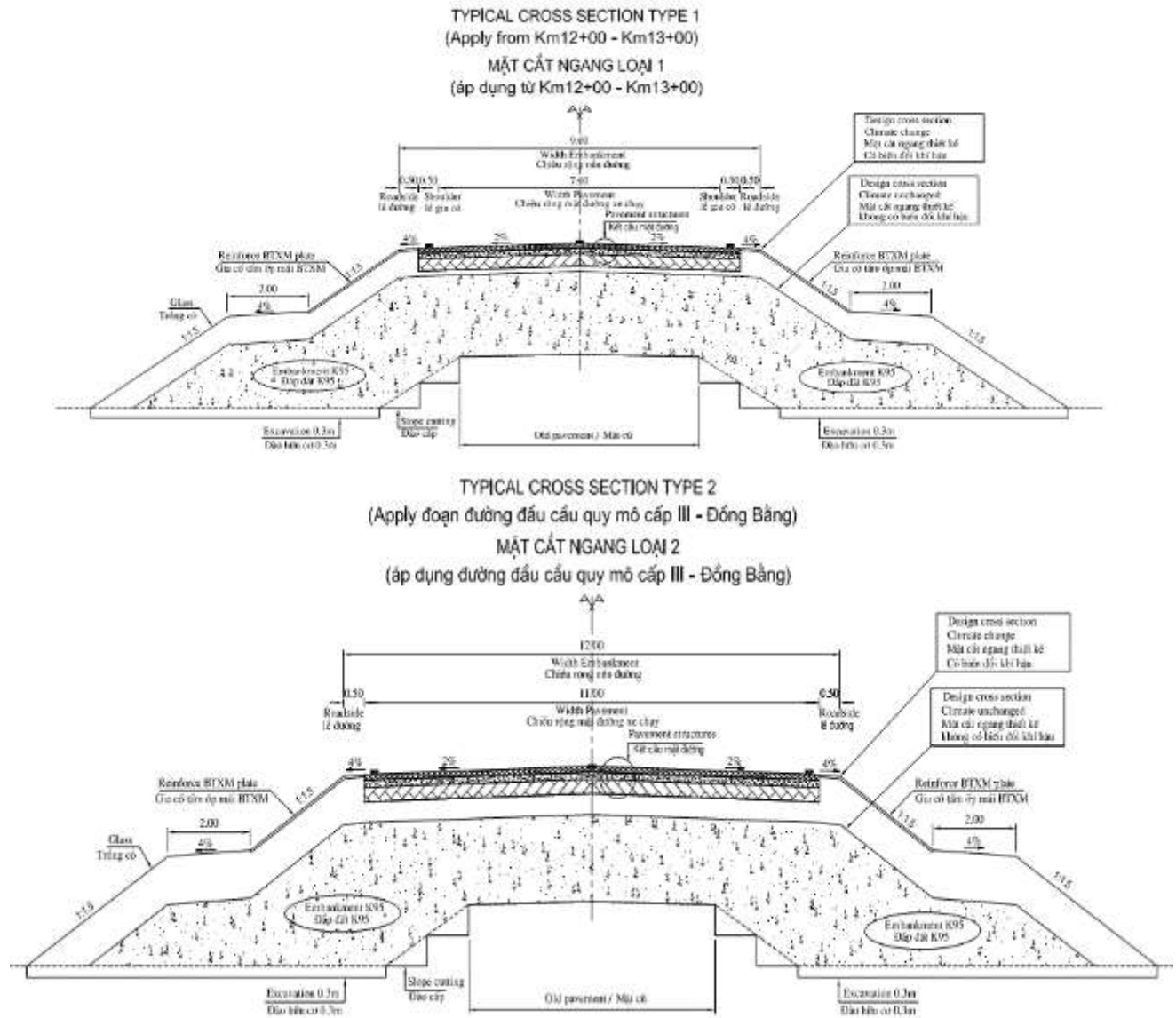


Meetings and Interviews and public consultations with Vinh Quang commune local HHs

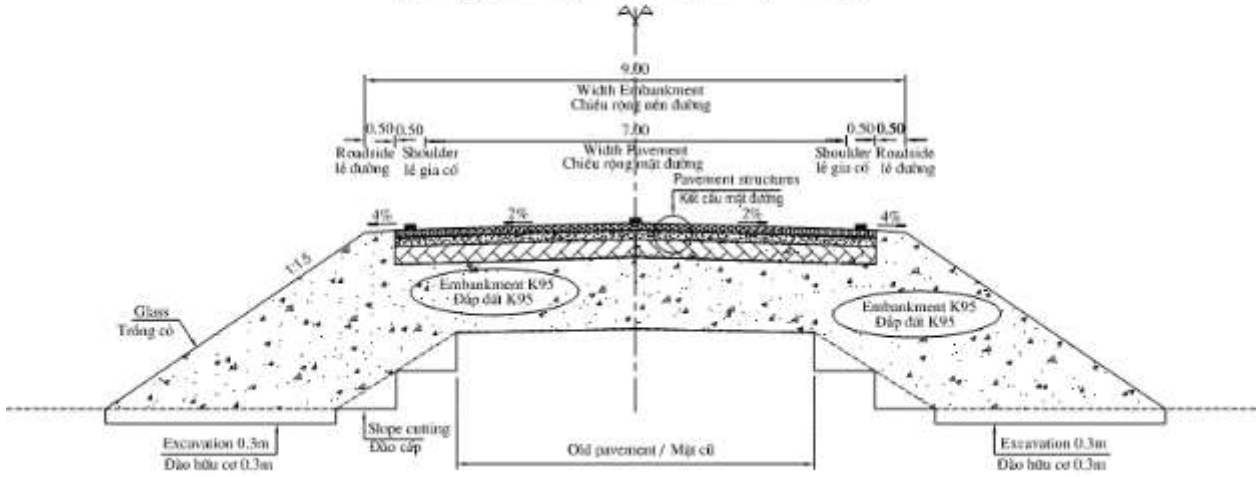
APPENDIX 6: EPP APPROVAL LETTER (*TO BE ADDED ONCE AVAILABLE*)

APPENDIX 7: INDICATIVE ENGINEERING DRAWINGS

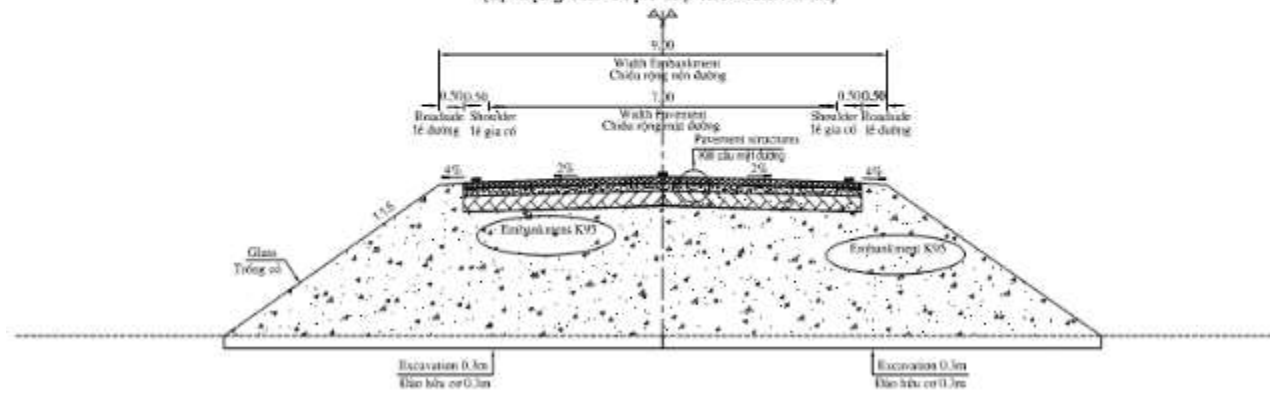
Figure A7.1: Road Cross-Section Drawings



TYPICAL CROSS SECTION TYPE 3
 (Apply thông thường)
MẶT CẮT NGANG LOẠI 3
 (áp dụng các đoạn đắp thấp thông thường)



TYPICAL CROSS SECTION TYPE 4
 (Apply đắp mới hoàn toàn)
MẶT CẮT NGANG LOẠI 4
 (áp dụng các đoạn đắp mới hoàn toàn)



APPENDIX 8: INFORMATION OF PROPOSED MINES AND DISPOSAL SITES

A. Soil Quarry at Ta Suc Industrial Zone in Vinh Quang Commune, Vinh Thanh District

- Location: Soil quarry is located on the left of the road at Km 11 + 350 in Vinh Quang commune, Vinh Thanh district, Binh Dinh province.
- Management unit: Currently, the soil quarry is under the management of Vinh Quang Commune People's Committee
- Reserve: Soil quarry with large reserves of about 2hectares x 5m = 100,000 m³
- Pathway from soil quarry to road: From the soil quarry to road PR637 at Km11 + 350 is 100m.
- Transport conditions: Convenient for transporting by 10 ton vehicles on the road.
- Other related issues: Currently the quarry is being exploited, but with small scale.

Figure A8.1: Photos of Soil Quarry at Ta Suc Industrial Zone



B. Sand Quarry of Tay Thuan Agricultural and Service Cooperative

- Location: At Km1 + 00, PR637 on the right of the road, in Thuong Son and Tay Thuan Hamlets;
- Management unit: Tay Thuan Agricultural and Service Cooperative, Tay Son District, Binh Dinh Province, Phone at sand quarry: 0256.3584.245
- Supply capacity: Supply about 100 m³/day.
- Pathway from sand gathering yard to road: Distance from sand yard to PR637 is 10m.
- Transport conditions: Convenient for transporting by 10 ton vehicles on road.
- Price: According to the price announcement of the Department of Finance and Construction of Binh Dinh Province.

Figure A8.2: Photos of Sand Quarry Owned by Tay Thuan Agricultural and Service Cooperative



C. Nhon Hoa Quarry, Binh Dinh Province

- Location: Tan Hoa Hamlet, Nhon Hoa Ward, An Nhon Town, Binh Dinh Province.
- Management unit: Tan Hoa Hamlet, Nhon Hoa Ward, An Nhon Town, Binh Dinh Province
- Reserves: 2.0 million cubic meter, good stone quality
- Conditions of transportation: convenient for transporting by vehicles on road.
- Price: According to the price announcement of the Department of Finance and Construction of Binh Dinh Province
- Other related issues: Stone quarry has adequate capacity for use to cast concrete bridge girders $M \geq 450\#, (45\text{Mpa})$.

Figure A8.3: Photos of Nhon Hoa Stone Mine, An Nhon Town, Binh Dinh Province



D. Phu Tai Concrete Co., Ltd. Batch Plant

- Location: Phu Tai Industrial zone, Tran Quang Dieu, Qui Nhon City, Binh Dinh
- Management unit: Phu Tai Concrete Co., Ltd.; Phone 090 359 40 47
- Supply ability: According to the needs of clients;
- Transport conditions: Convenient for transporting by vehicles on road.

E. Mekong Binh Dinh Concrete Co., Ltd.

- Location: Centre, Tran Quang Dieu, Qui Nhon City, Binh Dinh
- Management unit: Binh Dinh Mekong Concrete Co., Ltd.; Phone 0256 6552 277
- Supply ability: According to the needs of clients;
- Transport conditions: Convenient for transporting by vehicles by road.

F. Survey of Disposal Sites

1. Disposal site 1: In the area of Km11 + 648, on the left of the road, the land area of old flume of Ta Suc bridge is located in Vinh Quang commune, Vinh Thanh district, Binh Dinh province, the size of the land is 100m long, 50m wide, average height 5m; Area allowed for disposal: 5000m², volume allowed to disposal 25,000 m³.
2. Disposal site 2: In the area of Km11 + 648, on the right of the road, the land area of old flume of Ta Suc bridge belongs to Vinh Quang commune, Vinh Thanh district, Binh Dinh province, the size of the land is 100m long, 50m wide, and the average height 5m; Area allowed for disposal: 5000m², volume allowed to disposal 25,000 m³.



Photos of disposal site on the left



Photos of disposal site on the right