ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

VIETNAM EMERGENCY NATURAL DISASTER RECONSTRUCTION PROJECT

HA TINH SUBPROJECT

(For the first 18 months)

Ha Tinh, January- 2018
ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

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HA TINH SUBPROJECT

(For the first 18 months)

REPRESENTATIVE OF CLIENT
Ha Tinh Agriculture and Rural Development Work Construction Project Management Unit

CONSULTANT
Viet Nam Investment and Development Consultant Company Limited

HA TINH, January- 2018
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ABBREVIATIONS

<table>
<thead>
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<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>CSCs</td>
<td>Construction Supervision Consultants</td>
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<tr>
<td>DONRE</td>
<td>Departments of Natural Resources and Environment</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Assessment</td>
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<tr>
<td>ECOP</td>
<td>Environmental Codes of Practices</td>
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<td>EMP</td>
<td>Environmental Management Plan</td>
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<td>ESIA</td>
<td>Environmental and Social Impact Assessment</td>
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<td>ESMP</td>
<td>Environmental and Social Management Plan</td>
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<tr>
<td>PPMU</td>
<td>Project Management Unit</td>
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<tr>
<td>PPE</td>
<td>Personal protective equipment</td>
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<td>PPMU</td>
<td>Provincial Project Management Unit</td>
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<tr>
<td>QCVN</td>
<td>Vietnamese standard</td>
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<tr>
<td>TOR</td>
<td>Terms of Reference</td>
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<tr>
<td>VND</td>
<td>Vietnam Dong</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
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<td>WHO</td>
<td>World Health Organization</td>
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EXECUTIVE SUMMARY

Project Origin
The Government of Vietnam received a loan from the World Bank for Vietnam Emergency Natural Disaster Reconstruction Project including Binh Dinh, Phu Yen, Ninh Thuan, Quang Ngai and Ha Tinh provinces (hereafter called the ENDR). The Project Development Objective is to reconstruct infrastructure assets in the project areas. The project consists of 03 components including: (1) Resilient Reconstruction of Damaged Public Use and Preventive Infrastructure at the Provincial Level; (2) Disaster Recovery Capacity Enhancement; (3) Project Management Support. Tentative time of the ENDR project implementation is 4 years, from 2017 and to 2020. The total project cost is US$135.83 million.

The Ha Tinh subproject includes similar components with ENDR project: Component 1: Resilient Reconstruction of Flood-Damaged Infrastructure in Ha Tinh Province: Subcomponent 1: Reconstruction spillway, Outlet and upgrade Dyke Phuc-Long –Nhuong; Subcomponent 2: Reconstruction Khe Tria outlet and upgrade canal; Subcomponent 3: Reconstruction Tan Dua and My Thuan bridge. Component 2: Disaster recovery capacity enhancement (US$0.100 million): Training for capacity enhancement, public communication to promote efficiency of financed works; Cost for operation and maintenance (O&M). Component 3: Subproject management (US$2.470 million). The total cost of the Ha Tinh subproject is US$17.65 million.

Legal and Technical Basis for ESMP
The Ha Tinh subproject has been classified as Environmental Category B due to its moderate, site-specific, and reversible potential impacts and risks which can be mitigated with readily designed measures. The following World Bank safeguard policies have been triggered for Ha Tinh subproject: (a) Environmental Assessment (OP 4.01); (b) Natural Habitats (OP/BP 4.04); (d) Physical Cultural Resources (OP/BP 4.11); (e) Involuntary Resettlement (OP/BP 4.12). A Social and Environmental Management Plan (ESMP, this document) has been prepared in accordance with OP 4.01. The ESMP cover the works proposed for the first 18 months of the Ha Tinh subproject

Subproject Description
For Ha Tinh subproject in the first 18 months, 4 works will be constructed: (1) Reconstruct Spillway 19/5 (B = 79 cm & elevation of spillway threshold: 1,15m), Outlet 19/5 (5 gates with B = 2.5m/gate, elevation of culvert bottom is -1.5m), repair and reinfore Phuc-Long-Nhuong dyke (1571,1 m), Cam Xuyen district; (2) Reconstruct of Khe Tria Outlet (two gates, B = 12.5m/gate, Elevation of Outlet bottom is -1.5m); repair and reinforce 1200m of channel, Nghi Xuan district; (3) Reconstruct Tan Dua bridge (L = 166.7m,B = 5.5m) and My Thuan bridge (L = 64.43m, B = 5.5m). Each work item of the subcomponent will be constructed in 8-12 months (from 7/2017 - 7/2018).

Environmental and social baselines
According to the summary of Ha Tinh environmental status in the period 2011 - 2015: In general, surface water quality in Ha Tinh area had no signs of pollution except in some rivers near the urban areas of Ha Tinh city, Hong Linh town, Ky Anh town and near the discharging areas of some seafood processing factories, which have been contaminated organically. The quality of air, surface water, groundwater and soil are good.

Most of the subproject areas are far from residential areas: (i) There is three residential area around the site (about 50 households/residential), nearest distance to construction site is 50 - 200m, (ii) The area surrounding Khe Tria Outlet with a radius of 500m with 18 households
living in (iii) About 100m from Tan Dua bridge, there are 3 HHs, and (iv) About 100m from My Thuan bridge, there are 4 HHs. Some sensitive areas/receptors include: (i) Duoi Church is about 1km from the Spillway on Phuc-Long-Nhuong Dyke; (ii) Huong Trach Church of Tan Hoi Parish (lie in the side of NH15) is 100m from Tan Dua bridge. There is no PCR being affected in all 4 subproject areas.

**Environmental and Social Impacts and Risks**

The subproject’s potential impacts and risks have been identified. These are mostly temporal, localized and reversible due to the medium sized construction works. The impacts can be mitigated by applying appropriate technologies and site-specific mitigation measures together with close supervision by the contractor and consultation with local community.

**Generic impacts**

Dust, air emission, noise, vibration, wastewater and solid waste are generated construction and worker’s activities. These are considered from low to moderate for each works and can be mitigated.

**Site-specific impacts**

**Social impacts:** The subproject is estimated to implement land acquisition as follows: 9,939 m² of land owned by 22 households and managed by 05 commune/town PCs is permanently acquired, of which: (i) Affected agricultural land area: 750 m²; (ii) Affected public area: 9,189 m² managed by 05 commune/ward PCs, including specialized land, stream and river land, transport road; (iii) Temporary land acquisition: 4700m² of land managed by 04 communes (without temporary acquisition of land managed by Cam Phuc commune). Total 47 households are affected by construction, in which: (i) 22 households are in Ky Son commune directly affected by land acquisition for reconstruction My Thuan bridge; ii) 25 households are indirectly affected by cultivation on land area managed by PC; (iii) none of households have to relocate and resettle; (iv)12 households fall into vulnerable households, of which 06 households are severely affected (losing 10% or more of). (Details are shown in RAP under the subproject).

**Impacts on agricultural production activities** of local people include: (1) Spillway & Outlet on Phu-Long-Nhuong Dyke; and (2) Khe Tria Outlet. Dust from transportation, excavation and backfilling will affect the health of local people during rice cultivation as well as the development of rice. If not well gather and transport material, when it rain or heavy winds happen, dust and material will spill over the field, affecting the growth of rice. This impact is insignificant and can be minimized.

**Disruption of water supply:** These impacts might occur during construction of the spillway and outlet on Phuc-Long-Nhuong dyke which is responsible for supplying water for 700ha. Reconstruction is likely to prevent irrigation water supply, special in the growth period of rice (from February to May and July to September), damaging economic aspects of local people. The impact level is medium but this impact can be minimized by applying technical measures and construction time arrangement.

**Impacts on water environment and aquatic communities:** Spillway & Outlet on Phuc-Long-Nhuong Dyke and Tan Dua bridge, and My Thuan bridge. The impact can increase turbidity, construction material into rivers (19/5, Ngan Sau, Tri). During the construction phase, a amount of domestic waste and wastewater (1.6-2.4 m³/day) from workers’ camps can be discharged directly into river, would cause organic pollution (BOD, COD) and nutrient pollution (N, P) to the receiving waters. The level of the impacts, therefore, is low temporary and could be mitigated by good construction practices.
**Risk of Outlet subsidence during construction process:** (1) Outlet on Phu-Long-Nhuong Dyke; and (2) Khe Tria Outlet. During the under construction, if the heavy rain happens causing big flood, damage work items as sunken (spillway, outlet and dyke), eroded (wing wall of spillway and outlet, dyke, channel, bridge), broken (valve of outlet, piers of bridge). These impacts are small and mitigable.

**Risk of falling into rock:** In dry season, water level is low, river bed has many original rocks. If careless and not equipped labor protection, workers may be injured by falls into rocks from elevation 2.5m. Location can occur at My Thuan bridge. Risk of traffic accidents: Tan Dua and My Thuan bridge. The impact level is low and may be minimized.

**Impacts on sensitive receptors:** The construction of the different items of subproject will likely impact some sensitive receptors: (i) Duoi Church is 1km from Spillway and Outlet on Phuc-Long-Nhuong Dyke; and (ii) Huong Trach Church is opposite to Tan Dua bridge. Dust, noise, vibration, traffic accidents and conflicts between workers and catholics during transportation impact on spiritual activities of about 400 christian of Duoi Church and 500 christian of Huong Trach church. The impact level is assessed to be medium, temporary and possibly minimized.

**Mitigation measures**

**Mitigation on generic impacts**

The mitigation measures are given specifically for each impact source mentioned above in each phase of the subproject including Common impact mitigation measures (ECOPs), site-specific mitigation measures and impact mitigation measures on sensitive receptors, as well as social impact mitigation measures.

**Site-specific impacts**

**Social impacts:** (i) mitigating impacts from land acquisition for households in the subproject area; and (ii) prioritizing the construction option which requires the smallest land acquisition area. Total cost for compensation, support and resettlement of the 8 work items is 651,185,600 VND, equivalent to 28,687 USD.

**Mitigation of impacts on agricultural production activities:** Inform people about the time of construction so that people have plant to irrigation; Must arranges a suitable schedule; Mustn’t gather construction materials, and limit the excavation and backfilling in the sowing and harvesting period; Must cover material and gather in the suitable place.

**Mitigation of disruption of water supply:** - Use coffer dam for mitigating impacts incurred during the construction period on the quality of water sources and remain the water supply through the spillway and outlet. For spillway and outlet on Phuc-Long-Nhuong dyke, the construction of outlet first and spillway later in combination with surrounding dyke to ensure water supply through the outlet and spillway.

**Mitigation of Impacts on water environment and aquatic communities:** Create sedimentation traps, do not construct in the rain season, do not gather construction materials as well as machines and equipment near the river. Ensure compliance mitigation measures in the ECOP.

**Mitigation of Risk of Outlet subsidence during construction process:** Restrict works in the rainy season to reduce risk to water pollution accordingly; Ensure heavy equipment and loaded vehicles are parked a safe distance from all river banks; Ensure the constant presence of supervision consultants and contractors during construction to monitor the potential risk of erosion and landslides and if necessary take the appropriate actions.
Mitigation of Risk of falling into rock: Establish labor regulations; Ensure that workers will be equipped with labor protection equipment, especially helmet; Provide emergency first aid at the site; Install handrail on both side of the bridge.

Mitigation of Impacts on sensitive receptors: Inform local people about construction time; Do not transport, use mechanics which have heavy noise and construct items that generate a lot of dust and noise through the church on Major religious holidays(*); Install fences, barriers for dangerous warning/prohibition sites around the construction area which show potential danger to the public; Increasing watering the road near the Huong Trach church to 4 times/day; Request workers to strictly comply with labor regulations; Recruit local labors

Environmental and Social Management Plan (ESMP)

The ESMP of Ha Tinh subproject includes measures to reduce the negative impacts; roles and responsibilities for ESMP implementation, supervisors, environmental compliance framework, reporting arrangements, environmental monitoring program, capacity building program and the cost for ESMP implementation. Of which: the cost for environmental quality monitoring is about 2,009 USD and cost for capacity building is 7,048 USD.

ESMP during construction requires the involvement of several stakeholders and agencies, each with different roles and responsibilities including, PPMU, DONRE (Ha Tinh Department of Natural Resources and Environment), the Contractors, the Construction Supervision Consultant (CSC), and local communities

Public Consultation and Information Disclosure

Public Consultation: Public consultations on the subproject’s draft ESMP has been implemented in 5 communes/town of Ha Tinh province in March 2017. Meeting was held with the the representatives of local authorities, mass organizations; households to be directly affected by the subproject. Local authorities and people of ward/commune in the subproject area totally agreed with the implementation of the subproject because it will bring many socio-economic and environmental benefits. However, it is required to ensure environmental sanitation during construction process, particularly prevention from dust, gas, damage of roads and construction needs to be fast to ensure scheduled progress.

Information Disclosure: The first draft ESMP in Vietnamese had been published at the offices of 5 communes/town and the Ha Tinh PPMU in May 2017 for public hearing. The final ESMP in Vietnamese language was published at the offices of 5 communes/town and the Ha Tinh PPMU on June 12<sup>nd</sup>, 2017. The final draft ESMP in English will be disclosed at the World Bank’s internal and external websites on June 20<sup>th</sup>, 2017.
1. INTRODUCTION

1.1. Overview on ENDR Project


The PDO is to reconstruct and rehabilitate infrastructure assets in disaster-affected project provinces (85 percent) and strengthen the capacity of the Government to effectively respond to future disaster events (15 percent). The PDO will be achieved by rebuilding key infrastructure assets based on a ‘build back better’ approach emphasizing all stages of infrastructure life cycle including design, construction, and maintenance and strengthening institutional capacities for climate and DRM.

The specific objectives of the project include: (i) Repairing, restoration and upgrading of infrastructure works for production (works of irrigation, dykes, embankment, sea embankment, irrigation canals, reservoirs and so on) aims to restore production, protect lives safety, property for local people, mitigate the disaster risks and (ii) Damage restoration of transport infrastructure works for travelling of local people, commodity exchange and production development.

In order to achieve these objectives, the project consists of 03 components include: (1) Resilient Reconstruction of Flood Damaged Infrastructure at Provincial level; (2) Disaster recovery capacity enhancement; (3) Project Management. The total project cost is US$ 135.83 million.

**Component 1: Resilient Reconstruction of Damaged Public Use and Preventive Infrastructure at the Provincial Level (US$121.08 million)**

The objective of Component 1 is to strengthen resilience of flood-affected communities in five selected provinces through the reconstruction and rehabilitation of damaged critical provincial-scale infrastructure, especially irrigation, flood control, and road/bridge infrastructure. The affected areas will benefit from restored access to public services/facilities, thereby increasing the economic growth and access to social services. The reconstructed critical flood prevention structures and the restored roads and bridges will also increase the safety of people and assets and serve as supply and rescue lines in the event of a disaster. It will have five subcomponents, each of which will be implemented by the respective provinces:

- Subcomponent 1: Resilient Reconstruction in Binh Dinh Province
- Subcomponent 2: Resilient Reconstruction in Phu Yen Province
- Subcomponent 3: Resilient Reconstruction in Quang Ngai Province
- Subcomponent 4: Resilient Reconstruction in Ninh Thuan Province
- Subcomponent 5: Resilient Reconstruction in Ha Tinh Province

**Component 2: Disaster Recovery Capacity Enhancement (US$2.43 million)**

Component 2 will finance (a) evaluation of the effectiveness of the existing flood risk reduction efforts in the Central Region, using the 2016 floods as a case study; (b) development of streamlined fast-track procedures for preparation, prioritization, financing resources mobilization, and implementation of the emergency reconstruction and recovery; and (c) building capacity of DRM agencies on the damage and loss assessment methodology.

**Component 3: Project Management Support (US$12.32 million)**
1.2. Ha Tinh Subproject

Ha Tinh subproject consists of 03 components which are similar with those of ENDR project, namely:

**Component 1: Resilient Reconstruction of Damaged Public Use and Preventive Infrastructure at the Provincial Level**, which includes 3 subcomponents (4 works):

- Subcomponent 1: Reconstruct Spillway and Outlet on Phuc- Long- Nhuong dyke, Cam Xuyen district
- Subcomponent 2: Reconstruct Khe Tria Outlet and repair the channel of Khe Tria drainage system, Nghi Xuan district;
- Subcomponent 3: Reconstruct Tan Dua and My Thuan bridge;

**Component 2: Disaster Recovery Capacity Enhancement**

- Training, capacity building, community communication and O&M activities cost.
- Research, capacity building and training to promote efficiency of the subproject’s funded works.

**Component 3: Subproject Management Support**

- Provide support for effective subproject implementation, including subproject auditing, monitoring, and mid-term and end-term evaluation, supply of equipment and technical assistance to the PPMU during the subproject implementation process
- Provide reports and subproject management support to other components
- Provide institutional support and capacity building for subproject management, coordination, review and evaluation of technical, environmental and social safeguards aspects and subproject evaluation monitoring.
- Provide workshops to enhance the awareness of management officials and community related to natural disasters
- Provide budget support for key subproject official involving in the Subproject.

1.3. Legal and technical basis for ESMP

1.3.1. Legal and national technical basis

❖ Laws

- Revised Environmental Protection Law (LEP) No. 55/2014/QH13 of the National Assembly of Vietnam dated June 23, 2014 and effective from July 2015. This law enacted policies and regulations on environmental safeguards, and rights and obligations of organizations, households and individuals related to environmental protection activities.
- Land Law No. 45/2013/QH13 of the National Assembly of Vietnam dated November 29, 2013 prescribes the regime of land ownership, powers and responsibilities of the State in representing the entire-people owner of land and uniformly managing land, the regime of land management and use, the rights and obligations of land users involving land in the territory of the Socialist Republic of Vietnam;
- Law on Natural Disaster Prevention and Control No. 33/2013/QH13 of the National Assembly of Vietnam dated in June 19, 2013 provides natural disaster prevention and control activities; specifies the rights and obligations of agencies, organizations, households and individuals engaged in natural disaster prevention and control activities; and details the state management of, and assurance of resources for, natural disaster prevention and control;
- Law on Water Resources No. 17/2012/QH13 of the National Assembly of Vietnam dated June 21, 2012 provides on management, protection, exploitation and use of water resources,
as well as the prevention of, combat against and overcoming of harmful effects caused by water in the territory of the Socialist Republic of Vietnam;

- Law on Biodiversity No. 20/2008/QH12 of the National Assembly of Vietnam dated November 13, 2008 provides for the conservation and sustainable development of biodiversity; rights and obligations of organizations, households and individuals in the conservation and sustainable development of biodiversity;
- The Law on Construction No. 50/2014/QH13 approved on 18th June 2014 by 7th National Assembly of the Socialist Republic of Vietnam;
- The Law on Road Transport No. 23/2008/QH12 dated on 13/11/2008;
- The Law on Complaints 02/2011/QH13 dated 11 November 2011;
- The Law on Culture Heritage No. 10/VBHN-VPQH dated on 23/7/2013;
- The Law on Safety, Labor Sanitation No. 84/2015/QH13 dated June 25, 2015;
- The Law on Dike No. 79/2006/QH11 dated on 29/11/2006;

❖ Decrees

- Decree No. 38/2015/ND-CP of 24 April 2015 of the Government on management of waste and discarded materials;
- Decree No. 39/2015/ND-CP of the Government dated 27 April 2015 on assistance policy applied to ethnic minority and poor women who comply the population policy will take effect as from 15 June 2015;
- Decree No. 18/2015/ND-CP dated February 14, 2015 of the Government on environmental protection planning, strategic environmental assessment, environmental impact assessment, and environmental protection commitment;
- Decree No.19/2015/ND-CP of 14 February 2015 of the Government detailing the implementation of a number of articles of the Law on Environmental Protection;
- Decree No.44/2014/ND-CP dated 15 May 2014 of the Government providing regulations on land prices;
- Decree No.47/2014/ND-CP dated 15 May 2014 of the Government on compensation, support, and resettlement when land acquisition is required by the State;
- Decree No. 155/2016/ND-CP dated 18 November 2016 of the Government prescribing administrative sanctions for environmental protection;
- Decree No. 25/2013/ND-CP of 29 March 2013 of the Government on environmental protection charges for wastewater;
- Decree No. 67/2012/ND-CP of the Government dated 10 September 2012 on the amendment of Decree No. 143/2003/ND-CP of the Government dated 28 November 2003 on detailing the implementation of a number of articles of the ordinance on exploitation and protection of irrigation works;
- Decree No. 113/2010/ND-CP dated 3 December 2010 of the Government on valuation of damages caused to the environment;
- Decree No. 174/2007/ND-CP of 29 November 2007 on environmental protection charges for solid waste;

❖ Circulars
- Circular No. 27/2015/TT-BTNMT dated 19 May 2015 of the Ministry of Natural Resources and Environment on strategic environmental assessment, environmental impact assessment, and environmental protection plan;
- Circular No. 37/2014/TT-BTNMT dated 30 June 2014, providing detailed regulation compensation, assistance, and resettlement when the State acquires land;
- Circular No. 30/2014/TT-BTNM, regulating the records for land allocation or land lease, the change of land use purposes, land acquisition;
- Circular No. 36/2015/TT-BTNMT dated 30/6/2015 of Ministry of Natural Resources and Environment on hazardous waste management;
- Circular No. 22/2010/TT-BXD dated 03/12/2010 of Ministry of construction providing labor safety in construction;
- Circular No. 19/2011/TT-BYT of 06 June 2011 of the Ministry of Health guiding labor hygiene, laborers’ health and occupational diseases;

**Decisions**
- Decision No. 52/2012/QD-TTg, dated November 16, 2012 on the support policies on employment and vocational training to farmers whose agricultural land has been recovered by the State;
- Decision No. 16/2008/QD-BTNMT, dated December 31, 2008 of Minister of Natural Resources and Environment on the promulgation of national technical regulation on environment;
- Decision No. 22/2006/QD-BTNMT, dated December 18, 2006 of Minister of Natural Resources and Environment on the compulsory application of Vietnam’s standards about the environment;
- Decision No. 75/2014/QD-UBND dated 03 November 2014 of Ha Tinh PPC on compensation, assistance and resettlement when the State acquires land in Ha Tinh province;
- Decision No. 01/2016/QD-UBND dated 08 Jan 2014 of Ha Tinh PPC on compensation rates for housing, structures, graves, boats, equipments, famer tools, fishing tools, trees, crops and aquaculture when the State acquires land in Ha Tinh province.
- Decision No. 94/2014/QD-UBND dated 27 December 2014 on land price list 2015 in Ha Tinh province in the 5-year period (2015 – 2019);
- Decision No. 849/QD-UBND dated 30 March 2017 on approving the feasibility study report of ESMP of “Vietnam Emergency Natural Disaster Reconstruction Project – Ha Tinh subproject”.

**Applicable standards and codes**
- QCVN 08-MT:2015/BTNMT- National technical regulation on surface water quality;
1.3.2. The World Bank (WB) safeguard policies

(1) Project level

The following World Bank safeguard policies have been triggered: (a) Environmental Assessment (OP 4.01); (b) Natural Habitats (OP/BP 4.04); (c) Pest Management (OP 4.09); (d) Physical Cultural Resources (OP/BP 4.11); and (e) Involuntary Resettlement (OP/BP 4.12). The subproject has been classified as Environmental Category B subproject due to most of the potential impacts and risks are expected to be at moderate level, site-specific, and reversible which can be mitigated with readily designed known measures. In addition, the Bank’s requirements on public consultation and information disclosure will also be followed

(2) Subproject level

Environmental Assessment (OP/BP 4.01)

Environmental Assessment (EA) is an umbrella policy for the Bank’s safeguard policies. The overarching objective is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. The EA process is intended to identify, avoid and mitigate potential impacts of Bank operations. EA takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, and physical cultural resources); and transboundary and global environmental aspects. EA considers natural and social aspects in an integrated way.

Under Ha Tinh subproject, the first phase will carry out new construction of culverts and spillway over river 19/5 on Phuc –Long-Nhuong dyke, Cam Xuyen district; Repair and reconstruction of Khe Tria Outlet, Nghi Xuan; New construction of Tan Dua and My Thuan
bridges, Ky Anh district. The implementation process will cause potential negative impacts on environment and daily lives of local people in the subproject area, especially in the construction period. As policy OP 4.01, environment plan and social management plan (ESMP) and Environmental Protection Plan (EPP) or Environmental Impacts Assessment (EIP) will be also prepared in accordance with the GoV’s regulations. The subproject’s official ESMP and EPP will be announced in CPCs in the subproject areas and Ha Tinh PPMU in June/2017.

**Physical Cultural Resources (OP/BP 4.11)**

The subproject sites have been screened for PCR. Construction of the subproject items would affect some temples and pagodas located near the construction sites during construction. Therefore this policy is triggered. As the subproject involves certain quantity of earth works, the ESMP included ECOPs which covers a chance find procedure to address issues related to PCRs encountered during construction.

**Natural Habitats (OP/BP 4.04)**

This Policy is intended to prohibit the Bank-financed subprojects that cause significant degradation or conversion of critical natural habitats. The Bank does not support subprojects involving the significant conversion of natural habitats unless there are no feasible alternatives for the subproject and its siting, and comprehensive analysis demonstrates that overall benefits from the subproject substantially outweigh the environmental costs. If the environmental assessment indicates that the subproject would significantly convert or degrade natural habitats, the subproject includes mitigation measures acceptable to the Bank.

The subproject interventions are not located near or within any critical natural habitats and mainly involve rehabilitation and reconstruction activities on the existing infrastructures. Therefore, it will neither affect any protected areas nor rare and endangered flora or fauna species or high biodiversity areas. However, pollution risks related to removal and disposal of substantial quantities of non-hazardous construction materials associated with the destroyed structures (embankment protection devices, bridges) consisting of concrete, scrap metal, stone, sand from irrigation canals and small streams for rehabilitation and reconstruction works could affect natural habitats such as rivers or streams. Therefore, this policy is triggered. Impacts on natural habitats and associated mitigations measures will be addressed in the relevant subproject ESMPs.

**Involuntary Resettlement (OP/BP 4.12)**

OP 4.12 seeks to prevent severe long-term hardship, impoverishment, and environmental damage to the affected peoples during involuntary resettlement. It applies whether or not affected persons must move to another location. The Bank describes all these processes and outcomes as “involuntary resettlement,” or simply resettlement, even when people are not forced to move. Resettlement is involuntary when the government has the right to expropriate land or other assets and when affected people do not have the option to retain the livelihood situation that they have.

The affected areas will benefit from restored access to public services/facilities, thereby increasing the economic growth and access to social services. The reconstructed critical flood prevention structures and the restored roads and bridges will also increase the safety of people and assets and serve as supply and rescue lines in the event of a disaster.

The survey results showed that the implementation of works items under Ha Tinh subproject within first 18-month period will affect 47 households, in which 22 households are directly affected by land acquisition and 25 households are indirectly affected by cultivation on land area managed by commune/ward PCs; affecting 9,939m² of land.
The subproject RAP will be prepared and submitted to the Bank for approval. The respective Provincial People’s Committee (PPC) will then approve the RAP and all compensation, assistance and resettlement activities should be completed prior to civil works commencement.

**World Bank Group Environmental, Health, and Safety Guidelines**

World Bank-financed subprojects should also take into account the World Bank Group Environmental, Health, and Safety Guidelines (known as the "EHS Guidelines"). The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice.

The EHS Guidelines contain the performance levels and measures that are normally acceptable to the World Bank Group and are generally considered to be achievable in new facilities at reasonable costs by existing technology. The environmental assessment process may recommend alternative (higher or lower) levels or measures, which, if acceptable to the World Bank, become subproject- or site-specific requirements. This subproject should conform to these Guidelines.

2. **SUBPROJECT DESCRIPTION**

2.1. **Subproject implementation location**

The Subproject’s works items are located in Ha Tinh province, inclusive of 04 works, in the first 18 months:

**Subcomponent 1**: Repair, reconstruction Spillway and Outlet on Phuc-Long-Nhuong Dike which across 19/5 river, Cam Phuc commune, Cam Xuyen district, which includes:

(a) Reconstruction an Outlet  
(b) Reconstruction a spillway  
(c) Upgrade dyke

**Subcomponent 2**: Reconstruction and upgrade Khe Tria Outlet, Xuan Vien commune, Nghi Xuan district, which includes:

(a) Reconstruction Khe Tria Outlet  
(b) Upgrade a channel

**Subcomponent 3**: Reconstruction and upgrade Tan Dua bridge, Huong Trach commune, Huong Khe district and My Thuan bridge, Ky Son commune, Ky Anh district, which includes:

(a) Newly Tan Dua bridge  
(b) Reconstruction My Thuan bridge

Subproject locations are shown in the Figure 1 and Table 1.
Figure 1: Scope of work

Subcomponent 1: Spillway and Outlets on Phuc-Long-Nhuong Dike

Subcomponent 2: Khe Tria Outlet

Subcomponent 3:
(a) Tan Dua Bridge
(b) My Thuan Bridge
### Table 1: Summary on the construction work items

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Current situation</th>
<th>Investment scope</th>
<th>Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Subcomponent 1</strong></td>
<td><strong>Features of items of subcomponent 1:</strong></td>
<td></td>
<td><img src="image1" alt="Spillway" /></td>
</tr>
<tr>
<td></td>
<td>- Reconstruct:</td>
<td>- Support for irrigation: 700 ha</td>
<td>- Spillway:</td>
<td><img src="image2" alt="Outlet" /></td>
</tr>
<tr>
<td></td>
<td>- Spillway</td>
<td>- Protect area 3300 ha</td>
<td>- Elevation of spillway threshold: 1,15m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Outlet</td>
<td>- There is 03 residential area around the site (about 50 households/ residential). Nearest distance</td>
<td>- Overfall gaps: 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Repair and Upgrade</td>
<td>residential area to construction site is 50m;</td>
<td>- Structure of works: Reinforced concrete M250.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Phuc-Long-Nhuong Dyke</td>
<td>- In which:</td>
<td>- Auxiliary works: Energy dissipater; Local bridge on spillway (width of 1.5m; reinforced concrete M300)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Spillway</strong></td>
<td></td>
<td><img src="image3" alt="Outlet" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Coordination (UTM): 613221 E, 2018615 N</td>
<td></td>
<td><img src="image4" alt="Outlet" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Width: 62m</td>
<td><strong>Outlet:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Many part of the spillway yard was sunkened; the wing-wall was eroded severely.</td>
<td>- Type: Open sewer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Gates: 5 sluice gates;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Size: 2.5x2.5 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Elevation of culvert bottom: -1.5m</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Structure of works: Reinforced concrete M250.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Auxiliary works: Energy dissipater; Transport bridge is 3.5m wide</td>
<td></td>
</tr>
</tbody>
</table>
### Dyke
- Coordination (UTM): from (612645 E, 2019383 N) to (613329 E, 2019330 N)
- Soil dyke: B = 2.2 – 2.5m; Z = 1.8 – 2.2m
- Dyke face and slope are degraded
- Left side: river 19/5
- Right side: rice field

- Dyke:
  - Length: 1571.1 m
  - Elevation of Crest of breakwater: +2.95m
  - Elevation of dyke face: +2.15m
  - Width of dyke face: 3.5m
  - River side slope: m = 2
  - Field side slope: m = 2.5
  - Structure of works: Reinforced concrete M250
  - Auxiliary works: 02 drain (Reinforced concrete M250) on the right dyke at K0+260 and K1+090, drain size (BxH) = (1.0x1.0)m.

### Subcomponent 2:
- **Reconstruct:** Khe Tria Outlet
- **Repair and Upgrade the Channel**

- **Features of items of subcomponent 1:**
  - Protected area: 618 ha;
  - Nearest distance residential area to construction site is 50m (03 households);
  - In which:

  **Khe Tria Outlet**
  - Coordination (UTM): 578776 E, 2055049 N
  - Gate: no gate, free flow
  - Size (WxH): 3x1.45 m
  - Structure: stone and reinforced concrete
  - Small size not enough for flood drainage, wing wall was broken and eroded

- **Characteristic of the Outlet:**
  - Q = 29.5 m³/s
  - Form: Two-sluice gate culvert; size 12.5m
  - Elevation of culvert bottom: -1.5m
  - Accompanied works: Energy dissipater;
  - Structure of works: Reinforced concrete M250.
  - Auxiliary works: Energy dissipater, access canal is 1200m long
<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Current situation</th>
<th>Investment scope</th>
<th>Picture</th>
</tr>
</thead>
</table>
| 1. | Soil channel | - Coordination (UTM): from (578776 E, 2055049 N) to (579122 E, 2055227 N)  
- Length: 1200m  
- Task: flood drainage for Dong Tray lake  
- Right side: rural road  
- Left side: garden | - Dredging for extension of existing channel.  
- Length: 1200m  
- Qtk=29.5 m³/s  
- Width of channel bottom B=5 m  
- H = 2.5m  
- Embankment roof coefficient m = 1.5 | ![Cross Section of Channel](image) |
| 2. | Subcomponent 3: (a) Newly Tan Dua bridge | - Coordination (UTM): 583298 E, 2001707 N  
- Length: 145m;  
- Structure: reinforced concrete  
- Serve for about 7300 people live in Huong Trach commune  
- Path to bridge: National Highway NH15 | - Features of works:  
- Features of works:  
- Length: L = 166.7m;  
- Width: B = 5.5m  
- Number of spans: 9  
- Structure of works: Permanent | ![Newly Tan Dua Bridge](image) |
<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Current situation</th>
<th>Investment scope</th>
<th>Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>and commune road</td>
<td>bridge, reinforced concrete.</td>
<td><img src="image1.jpg" alt="Picture" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Nearest distance residential area to construction site is 50m (03 households);</td>
<td></td>
<td><img src="image2.jpg" alt="Picture" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The new bridge was built to replace the existing bridge which was severely damaged in the flood in 2016, the piers were tilted)</td>
<td></td>
<td><img src="image3.jpg" alt="Picture" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Vehicle &gt;2.5 ton are forbidden go through the bridge</td>
<td></td>
<td><img src="image4.jpg" alt="Picture" /></td>
</tr>
</tbody>
</table>

### Subcomponent 3:
- Coordination (UTM): 623136 E, 1989922 N
- Length: 64m;
- Structure: reinforced concrete
- Serve for about 1000 people live in Ky Son commune
- Path to bridge: commune road
- Nearest distance residential area to

- **Features of works:**
  - Length: \( L = 64.43 \)m;
  - Width: \( B = 5.5 \)m
  - Class of works: Class V
  - Structure of works: Permanent bridge, reinforced concrete.
<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Current situation</th>
<th>Investment scope</th>
<th>Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>construction site is 100m (04 households); - The new bridge was built to replace the existing bridge which was severely damaged in the flood in 2016, the piers were tilted, and two heads of the bridge were damaged. Motorbike and cars are forbidden go through the bridge</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Techno-economic report of the subproject, 2017*
2.2. Construction methods

2.2.1. Construction methods of culverts and spillway
- Embankment of protecting dyke, downstream of culverts and spillway.
- Pumping water into foundation pit and foundation excavation.
- Construction of waterproofing piles.
- Reinforcement, assembly and concreting.
- After the new culvert is completed, the old one will be filled.
- Backfilling of the cross-section of the dyke at the former position in accordance with the designing document.
- Demolition of the protecting dyke and reinstate the diversion canal.

2.2.2. Construction method of the dyke
- Before construction, the site within the designed area must be leveled.
- Ranking of dyke roof level, removal of the weathering layer at positions shown in the documents.
- Reinforce dyke slope and sunken.

2.2.3. Construction of bridge
- Positioning of the bridge center and removal of the high remark-coordinates out of the construction area.
- Soil excavation for the hole of pier by open excavation method
- Erection of formwork, reinforced concrete and concreting the pier-abutment.
- Erection of reinforced concrete and plate girder concreting
- Then, construction of handrail, talus roof reinforcement of access roads
- Completion and cleaning of the site.

2.3. List of machines and equipment
Major machines and equipment for the construction consists of excavator, bulldozers, trucks, concrete mixers and mobile cranes, etc. List of machines and equipment tentatively used for the construction works is presented in Table 2

<table>
<thead>
<tr>
<th>Equipment/Machines</th>
<th>Excavator 1.6m³</th>
<th>Bulldozer ≤ 140CV</th>
<th>Truck 10 tons</th>
<th>Electric generator</th>
<th>Concrete mixer</th>
<th>Mobile crane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dike</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Khe Tria Outlet</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Tan Dua bridge</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>My Thuan bridge</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

(Source: FS, 2017)

2.4. Material demand
Main materials for construction items of the subproject consist of: sand, brick, cement, steel, etc.
Main materials for installation of items of the subproject: water pipes and water-related equipment, electrical wire and illuminating devices, waste bins, etc.

Additionally, in order to build the subproject’s items in accordance with the schedule, precast, high quality and fast-installation materials such as pre-cast concrete culvert, asphalt concrete should be used. Volume of construction materials is shown in the Table 3

### Table 3: Material volume

<table>
<thead>
<tr>
<th>Items</th>
<th>Sand (m$^3$)</th>
<th>Stone (m$^3$)</th>
<th>Cement (kg)</th>
<th>Steel (kg)</th>
<th>Geotextile (m$^2$)</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dike</td>
<td>3,132</td>
<td>14,907</td>
<td>1,798,303</td>
<td>339,311</td>
<td>16,164</td>
</tr>
<tr>
<td>2</td>
<td>Khe Tria Outlet</td>
<td>26,000</td>
<td>181,000</td>
<td>5,546,000</td>
<td>970,890</td>
<td>15,000</td>
</tr>
<tr>
<td>3</td>
<td>Tan Dua bridge</td>
<td>3,683</td>
<td>10,522</td>
<td>2,000,870</td>
<td>485,580</td>
<td>4,725</td>
</tr>
<tr>
<td>4</td>
<td>My Thuan bridge</td>
<td>1,902</td>
<td>5,433</td>
<td>1,033,090</td>
<td>250,715</td>
<td>2,440</td>
</tr>
</tbody>
</table>

(Source: FS, 2017)

Selected construction materials include backfill soil, cement, sand, stone, steel… which are available in Ha Tinh province. The selection of local materials is to ensure the quality of the work and save the construction cost, and help the contractor actively carries out the works. Sand, gravel, and stones are provided from mines. Cement and steel are purchased at construction material dealers.

### Table 4: Locations and distance of material transportation

<table>
<thead>
<tr>
<th>Items</th>
<th>Material supplying places</th>
<th>Transportation route</th>
<th>Distance (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spillway, culvert over the 19/5 river on Phuc Long – Nhuong dyke</td>
<td>Construction materials such as cement, iron, steel, sand, stone are bought at Cam Xuyen town. The backfilling materials are bought at the pits in Cam Hung commune.</td>
<td>Thien Cam – province road 551 – rural road - construction site.</td>
<td>7.5</td>
</tr>
<tr>
<td>Khe Tria Outlet</td>
<td>- Backfilling soil: Supplying source is bought from the borrow pit in the commune;</td>
<td>- Rural road (class 5 road)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>- Stones: The supplying source is bought at Hong Linh quarries;</td>
<td>- NH1A$^1$ – NH8B – rural road – construction site (class 2 road of 6km; class 5 of 2.5km)</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>- Other materials: the supplying source is at Xuan An town;</td>
<td>- NH8B – rural road – construction site (class 2 road of 6km; class 5 of 2.5km)</td>
<td>9</td>
</tr>
<tr>
<td>Tan Dua bridge</td>
<td>- Sand: At Phuc Trach</td>
<td>- NH15 – construction site</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>- Stones: La Khe quarries</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>- Backfilling soil: Exploitation at the hill near the subproject area</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>- Others: Cement, iron, steel, etc bought in Huong Khe town.</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>My Thuan</td>
<td>- Soil is from Ky Hoa pits</td>
<td>- NH1 – NH12 - AH131$^2$</td>
<td>25</td>
</tr>
</tbody>
</table>

$^1$ NH: National Highway
$^2$ AH: Asian Highway
ESMP of “Vietnam Emergency Flood Disaster Reconstruction Project – Ha Tinh subproject”

<table>
<thead>
<tr>
<th>Items</th>
<th>Material supplying places</th>
<th>Transportation route</th>
<th>Distance (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>bridge</td>
<td>- Sand: at Ky Lam pit</td>
<td>- NH1 – NH12 - AH131 – district road - construction site</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>- Stone: Ky Tan quarries</td>
<td>- AH131 – district road - construction site</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>- Others: Cement, iron, steel etc., bought at Ky Anh town</td>
<td>- AH1 – NH12 – AH131 – district road - construction site</td>
<td>20</td>
</tr>
</tbody>
</table>

Disposal site

Some of construction waste will be used for leveling and the rest is dumped at the disposal site. All disposal locations had been permitted by the local governments.

**Table 5: Locations and distance of disposal transportation**

<table>
<thead>
<tr>
<th>Items</th>
<th>Disposal places</th>
<th>Transportation route</th>
<th>Distance (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spillway, outlet on Phuc Long – Nhuong dyke</td>
<td>The lowland in Cam Long commune, near the discontinued Titanium exploit site. The area is 20,000m², storage capacity is 50,000m³. It is fully enough for disposal demand of this item</td>
<td>Construction site - rural road – province road 551 - rural road</td>
<td>3.3</td>
</tr>
<tr>
<td>Khe Tria Outlet</td>
<td>The site in hamlet 4, Xuan Linh. It was previously used as borrow pit for the Hong Linh brick factory. The area is 15,000m², storage capacity is 38,000m³. It is fully enough for disposal demand of this item</td>
<td>Construction site – rural road – NH8B</td>
<td>5</td>
</tr>
<tr>
<td>Tan Dua bridge</td>
<td>Lowland near Huong Trach CPC, which is no use for agriculture. It is currently used to contain construction waste from nearby households. The area is 10,000m², storage capacity is 25,000m³. It is fully enough for disposal demand of this item</td>
<td>Construction site – rural – disposal site</td>
<td>6</td>
</tr>
<tr>
<td>My Thuan bridge</td>
<td>Lowland in Hamlet 7, which is no use for agriculture. It is currently used to contain construction waste from nearby households. The area is 7,000m², storage capacity is 18,000m³. It is fully enough for disposal demand of this item</td>
<td>Construction site - district road – disposal site</td>
<td>4</td>
</tr>
</tbody>
</table>

2.5. Worker demand

Demand for workers for construction of each item is about 20-30 people/site. Most of the subproject sites are at convenient locations to gather materials as well as worker camps. However, the construction is carried out at many places of Ha Tinh province, with limited supply of water and electricity, the number of workers is not high and constructing in short time, so the simple camps will be setup to ensure the daily living conditions for workers.
2.6. Auxiliary works
For each auxiliary work, worker camps, warehouse and material yards are included.

Worker camps are erected by steel column, surrounding wall by corrugated iron sheets, canvas; the roof is covered by the corrugated iron sheets or fibrocement; cement floor.

The warehouse near the worker camp is the place to gather construction materials such as cements, grease, and steel. The warehouse’s specifications: steel column, corrugated iron roof, the surrounding wall is made of steel B40, cement floor. Sand, stone, brick are stored at the site.

2.7. Investment Capital
Total investment for construction items is about 88.7 billion VND (3.9 million USD) (detail in Table 6).

<table>
<thead>
<tr>
<th>Table 6: Total investment for construction items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Items</strong></td>
</tr>
<tr>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dyke</td>
</tr>
<tr>
<td>Khe Tria Outlet</td>
</tr>
<tr>
<td>Tan Dua bridge &amp; My Thuan bridge</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

(Source: FS, 2017)

2.8. Implementation Schedule
Each item will be constructed within 18 months, from 6/2017 -12/2018.

2.9. Organization of the subproject implementation
- **Subproject employer:** Ha Tinh provincial Subproject Management Unit of Construction works for Agriculture and Rural Development.
- **Compensation and site clearance:** Signing contract with Land Fund Development Centre of Ha Tinh province – district/city branch to prepare plan and carry out the payment of compensation for each work item.
- **Appraisal and approval:** Ha Tinh Provincial People’s Committee is the competent authority to appraise and approve.
- **Operation and management agency:** The subproject is small scope and as decentralization, subproject district People’s committee will assign ward/commune People’s committee to establish the agency for operation and management of the works.

3. NATURAL ENVIRONMENT AND SOCIO-ECONOMIC CONDITIONS

3.1. Natural conditions

3.1.1. Topographic characteristics
Ha Tinh is located in East of Truong Son mountain range. The mountainous terrain covers 80% natural area, the plain area makes up only small area and is separated by mountain ranges and rivers and streams. The subproject area is characterized by two main terrains as follows:

- **Tectonic valley- intrusion:** This terrain makes up a small area but brings huge advantages for agricultural production. The height is less than 300m, including Ngan Sau river valley, paralleling to the mountain range. The terrain is formed by crumbled sediment and prone to intrusion. The terrain of Khe Tria Outlet, Tan Dua bridge and My Thuan bridge belongs to
this type.

- **Plain area**: Ha Tinh is located along the coastal area with an average height of under 3 m. The terrain is lowly undulated from the mountainous area to the West and narrows down toward the South. In general, the terrain is relatively plain, especially the region formed by large rivers in the province. The province’s soil mechanics is argillaceous soil from medium to low. The terrain of the Spillway and Outlet on Phuc-Long-Nhuong Dike belongs to this type.

3.1.2. **Geological characteristics**

Ha Tinh Investment Consultant and Construction JSC drilled to take samples. The result shows that the construction locations have a stable geological foundation. Detail geological drilling results are shown in the Table 7.

**Table 7: Geological condition at the plain subproject area**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer 1</td>
<td>Sand mixed yellow gray medium tight;</td>
</tr>
<tr>
<td>Layer 2</td>
<td>Crushed sand, gravel, pebbles, yellowish medium;</td>
</tr>
<tr>
<td>Layer 3</td>
<td>Clay gray clay gray to flexible state;</td>
</tr>
<tr>
<td>Layer 3a</td>
<td>Black-brown clay, yellowish-gray to hard-edged;</td>
</tr>
<tr>
<td>Layer 4</td>
<td>Gray and white gray stone, strongly strong, split layer;</td>
</tr>
<tr>
<td>Layer 4a</td>
<td>Claystone weathered strongly to full, hard to hard anymore;</td>
</tr>
<tr>
<td>Layer 5</td>
<td>Stone weathered gray textured black and white clumps;</td>
</tr>
<tr>
<td>Layer 5a</td>
<td>Claystone weathered strongly to complete clusters of clay black clay dark brown clay;</td>
</tr>
<tr>
<td>Layer 5b</td>
<td>Claystone clay strongly strongly cracked clumps alternating yellow clay</td>
</tr>
<tr>
<td>Layer 6</td>
<td>Stone gray black, white hardness, hardness grade IV - VI.</td>
</tr>
</tbody>
</table>

3.1.3. **Climate characteristics**

Ha Tinh is located in the tropical monsoon which is characterized by cold winter as the North Vietnam. The climate is distinguished into 02 distinct seasons: cold and hot. The average temperature in Ha Tinh is relatively high, average temperature in years is about 23.8°C. June is the hottest month with the highest temperature up to 40.1°C. The lowest temperature recorded is 6.8°C on 28/12/1982 *(Source: Centre for Hydro - Meteorological Forecasting, 2015)*.

The flood season is same with rain season from August to November. Average monthly rainfall is from 500 – 600mm. According to the rainfall measurement data in the rainy flood 10/2016 at the construction sites, the largest rainfall up to 220mm/day in Ky Anh district and 350mm/day in Huong Khe district.

Total evaporation of the year is up to 783.7mm. The maximum evaporation month is in June, 6mm/day. The minimum is in December, 0.01 mm *(Source: Centre for Hydro - Meteorological Forecasting, 2015)*.

Wind: In the summer, the main wind direction is Northwest to North with average speed is about 1-1.4 m/s. In the winter, wind direction is Northeast with the average speed is about 1.0-1.5m/s.

3.1.4. **Characteristics of rivers and lakes**

The subproject area involves 3 rivers and one lake:

- 19/5 River: length 8km run through communes: Cam yen, Cam Nam and Cam Phuc flow into
Gia Hoi river and flow to Cua Nhuong (distance from the spillway to Gia Hoi river is 1.3km). In the dry season, maximum of discharge is 0.466m³/s with elevation by 1.25m. In the rainfall season, maximum of discharge is 196 m³/s and with elevation of 2.2m. Spillway and Outlet on Phuc-Long-Nhuong Dyke is installed in this river.

- Ngan Sau and Tri river (subproject section): In the dry season, maximum of discharge is 0.23m³/s with elevation by 0.57m. In the rainfall season, maximum of discharge is 196 m³/s with elevation by 2.2m. Tan Dua and My Thuan bridges are built cross over the two rivers.

- Dong Tray Lake: Normal water level is 12.3m; flood water level is 12.67m; V = 10⁵m³. Khe Tria Outlet and channel are designed for drainage of May-flood (Q_max =26.5m³/s) of Dong Tray lake.

3.2. Current status of environmental quality

Taking samples was carried out in the subproject area in March 2017. Specifically, total of 5 samples were taken including 5 samples of air, 4 samples of surface water and 4 samples of ground water. Samples are analyzed by Ha Tinh Technology and Monitoring Center. The results showed that air environmental quality in the area is good in accordance with the QCVN 05:2013/BTNMT and QCVN 06:2010/BTNMT. Quality of existing water surface is still good in line with QCVN 08:2015/BTNMT. The underground water is within the permissible level of the QCVN 09:2015/BTNTM. According to overall results from Ha Tinh Technology and Monitoring Center, the content of heavy materials such as Cu, Pb, As in 2016 are within the allowable level of QCVN 03:2015/BTNMT. Therefore, the environmental quality in the subproject area has not shown any signs of pollution to environmental component, the monitoring parameters are within the allowable standards.

3.3. Current status of biological resources

The subproject ecosystem around construction sites is the agricultural ecosystem; There are no national forest or protected areas near the sites. Plants in the subproject area mainly are food crops such as rice, corn, potato, cassava, fruit trees and timbers such as longan, guava, jackfruit, eucalyptus and acacia. Surrounding the subproject area, no precious plants are found. Terrestrial animals in the subproject area are those familiar to the human such as flower pecker, sparrow, lizards, frog. The aquatic ecosystem includes fish: anabas, carp, hypophthalmichthys, shrimp, crab, algae, pistia, etc. In general, the fauna and flora in the subproject area are common ones without any specious species and having no value in terms of ecology.

3.4. Socio-economic conditions

3.4.1. Features of socio-economic

The works cover 5 rural communes in Ha Tinh. These are poor communes with dispersed population which has an average density of 4000 person/1km². There is no ethnic minority people live in these areas. Local people living around the subproject area mainly rely on agriculture
Table 8: Socio-economic information of communes in the subproject area

<table>
<thead>
<tr>
<th>No.</th>
<th>Commune/Town</th>
<th>District/City</th>
<th>Areas (ha)</th>
<th>Popu. (person)</th>
<th>Household</th>
<th>Ratio of pop. increase (%)</th>
<th>Ratio of poor household (%)</th>
<th>Ratio of near poor household (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Xuan Vien</td>
<td>Nhi Xuan</td>
<td>2,124.70</td>
<td>4208</td>
<td>1322</td>
<td>0.63</td>
<td>6.22</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Huong Trach</td>
<td>Huong Khe</td>
<td>11,230.06</td>
<td>7245</td>
<td>1857</td>
<td>0.86</td>
<td>7.34</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Ky Son</td>
<td>Ky Anh</td>
<td>89.99</td>
<td>5848</td>
<td>1342</td>
<td>0.71</td>
<td>15.43</td>
<td>8.73</td>
</tr>
<tr>
<td>4</td>
<td>Cam Phuc</td>
<td>Cam Xuyen</td>
<td>57.36</td>
<td>8,113</td>
<td>1948</td>
<td>0.92</td>
<td>8.2</td>
<td>8.6</td>
</tr>
<tr>
<td>5</td>
<td>Thien Cam</td>
<td>Cam Xuyen</td>
<td>1,407.17</td>
<td>4939</td>
<td>968</td>
<td>-</td>
<td>11.7</td>
<td>-</td>
</tr>
</tbody>
</table>

(Source: Socio-economic development situation report of communes/towns in 2016)

3.4.2. Infrastructure characteristic

1. Water supply system

In the subproject area, there has been no hygienic water system. Domestic water of local people is from drilled wells. Water for the subproject use is from wells of households near the site.

Water for the construction is from rivers: 19/5, Ngan Sau, Tri and from Dong Tray lake. At the region which is hard to access water sources, the contractor may discuss with neighboring households for using their water or drilled wells at the site.

2. Water drainage

Currently, the subproject areas don’t have drainage and wastewater treatment system. Stormwater and effluent are released into 19/5, Ngan Sau, Tri river. Wastewater of households near the site is treated through squat toilets. By this, water will be evaporated and absorbed into the soil and flow to the river and stream. Overflow stormwater run along the slope terrain and absorb into the soil before flowing into the streams and rivers.

3. Electricity supply

The subproject areas are equipped with national power system for domestic and construction activities.

4. Solid waste management

Environmental sanitation in 4 sites of the subproject, normally households gather domestic waste in regulated points where the waste collection team of the district/town will collect every three-four times per week. Solid waste collection at the subproject area is carried out by 4 cooperatives in the Infrastructure-Economic Division of the district, town and Ha Tinh Urban Environment Joint Stock Company.

The road system in the subproject area include inter-village concrete road (class 5 road) with allowable load as 8 tons; the road is connected to NHs (class 2 road): NH1A, NH8B, NH12, AH131, NH15. Thus, the transportation of materials to the works is very favorable. Therefore, in this subproject, contractor have to use trucks under 8 tons.
3.4.3. **Infrastructure damages due to natural disaster in Ha Tinh province**

Ha Tinh province is seriously suffered from natural disasters impacts. Annual droughts, floods and storms cause more damage to people and property. The affected area is in Ha Tinh province. According to statical data of Ha Tinh Department of Agriculture and Rural Development:

In 2016, Ha Tinh suffered from two major floods, seriously affect to the lives of people.

- **Flood from October 12th to October 16th, 2016:**
  - 108/262 communes, wards, towns with 32,372 households were flooded, some locations deeply flooded up to 3.0m and was isolated; some inter-district/commune transport roads were deeply flooded, causing congestion and difficulties for rescue
  - People: 09 deaths, 36 the injured, 32,372 households were flooded, of which 510 households were flooded above 3.0m; 08 permanent houses were severely damaged. This damage was estimated over VND 200 billion.
  - Affected agriculture: rice filed: 619 hectares, 2,530 hectares of crops, 1,030 hectares of fruit trees; 1,613 cattle units and 313,171 poultry was dead; 2,325 hectares of aquaculture ponds were flooded; This damage was estimated over VND 360 billion.
  - Damage of infrastructure structure: road: 91,687m; 2,515m of dykes and embankment was landslide; 46,452 m of canals, ditches was cracked; 61 pump stations were collapsed, 285 culverts and bridges were affected, 105 schools were inundated, 57 health facilities were impacted; 24 cultural works were demolished; 59 telecommunication poles were fractured smashed and so on. This damage was estimated over VND 505 billion.

- **Flood from November 29th to November 2nd, 2016**
  - 46 communes, wards with 4,408 households in Huong Khe, Vu Quang, Ky Anh, Cam Xuyen and Ky Anh districts, with deep flood level from 1.0m to 2.0m; some locations were flooded over 3.0m; some communes were isolated; National Highway 1A, section across Ky Anh town was inundated with deep level of 0.5m; many inter-district/commune transport roads were deeply flooded from 1.0m to 2.0m, causing congestion
  - Affected agriculture: rice field: 221 hectares, 155 hectares of fruit trees was flooded and destroyed; 79 cattle and 23,468 poultry were dead.
  - Damage of infrastructure structure: road: 4,500m was landslide and damaged; 4,883m of dykes, embankments was broken; 1,745m canals, ditches was destroyed; 43 bridges, culverts, dams were washed away and damaged.

Total damage was estimated over VND 1,285 billion by 02 flood times
3.5. Sensitive receptors

Sensitive receptors are included the descriptions as follow:

<table>
<thead>
<tr>
<th>No.</th>
<th>Sensitive receptors</th>
<th>Location/ Description</th>
</tr>
</thead>
</table>
| 1   | Duoi Church, Cam Phuc commune, Cam Xuyen district | • Distance from the church to Spillway and Outlet on Phuc-Long-Nhuong Dyke is about 1km  
• This church is the place where 400 christian come to pray in weekend and holidays (*) |
| 2   | Huong Trach Church of Tan Hoi Parish, Huong Trach commune, Huong Khe district | • The Church is located in the side of NH.15, opposite to the construction site of Tan Dua bridge. The distance from the gate of the church to the construction site is 110m.  
• This place is where local 500 christian come to pray in weekend and holidays (*) |

(*) Major religious holidays: Christmas day (25/12); the Easter (8/4/2018); Thanksgiving days (23/11/2017 & 22/11/2018); Saint Feast Days (1/11); All Souls Day (2/11); Feast of Our Lady (8/12);

4. ENVIRONMENTAL AND SOCIAL IMPACTS

In general, all work items are small and medium-sized construction, in which, the majority of negative impacts on the environment are temporary and can be mitigated through the adoption of measures to manage the construction and appropriate technological engineering, under the strict supervision of implementation process of contractors and local public consultation.
4.1. Impacts in pre-construction phase

4.1.1. Generic impacts

1. Air quality impacts

❖ Dust

Dust generation activities include (i) demolition existing works damaged by natural disaster in 03 sites (Spillway & Outlet on Phuc-Long-Nhuong Dyke; Khe Tria Outlet and My Thuan bridge); (ii) clearance of trees and bushes in all of 04 sites; (iii) transportation of waste disposal.

The results of calculating the dust content arising from the demolition of the subproject items are as follows:

Table 10: Concentration of dust arising from demolition

<table>
<thead>
<tr>
<th>No.</th>
<th>Work item</th>
<th>Demolition volume (m³)</th>
<th>Demolition (1h) (mg/m³)</th>
<th>Transportation of waste (mg/m³)</th>
<th>QCVN 05:2013/ BTNMT (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dyke</td>
<td>2293</td>
<td>0.16</td>
<td>0.23</td>
<td>0.3</td>
</tr>
<tr>
<td>2</td>
<td>Khe Tria Outlet</td>
<td>423</td>
<td>0.12</td>
<td>0.19</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Tan Dua bridge</td>
<td>35</td>
<td>0.05</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>My Thuan bridge</td>
<td>562</td>
<td>0.5</td>
<td>0.34</td>
<td></td>
</tr>
</tbody>
</table>

(i) Dust generated by demolition is calculated 1 hour at the 04 sites from 0.05 ÷ 0.16 mg/m³ less than the permitted limit of QCVN 05:2013/BTNMT (0.3 mg/m³). Except at My Thuan Bridge, the concentration is 0.5 mg/m³ larger than the standard about 1.7 time. Dust generation can affect air quality, workers and local people in neighboring area of the subproject, special in My Thuan bridge. However, distance from the nearest household to the site is 100m (04 households), this impact is small.

(ii) During the pre-construction phase, temporary traffic congestion occurs on existing temporary roads. Constructor use truck under 8 tons with volume = 5 m³. Thus, based on volume of waste and demolition time (6-12 day), number trips to transport are 72 trips/day/4 sites. The distance from construction site to the disposal site, dust emission from transportation of waste from 0.04 to 0.23, lower than QCVN 05:2013/BTNMT, except at My Thuan Bridge, the concentration is 0.34 mg/m³ larger than the standard about 1.1 times. This impact will affect to local people who live along the route. However, the transportation times is short (01-02 weeks/01 site), the impact level is low and can be mitigated.

❖ Air emission

Emission from construction

Construction of subproject items will use some construction machines and equipment. Most of the devices use Diezel, so the process of operation will emit pollutants such as: dust, CO, SO₂, NOₓ. Emission arising from the operation of machines and equipment on the construction site is shown in the Table 11

Table 11: Emission arising from construction

<table>
<thead>
<tr>
<th>No.</th>
<th>Work item</th>
<th>Concentrations (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SO₂</td>
</tr>
<tr>
<td>1</td>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dyke</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>Khe Tria Outlet</td>
<td>0.01</td>
</tr>
</tbody>
</table>
Emission concentration in all sites is lower than QCVN 05:2013/ BTNMT. This will be effect to workers but this impact is small.

**Emission from material transportation**

Air emission generated from using diesel of trucks. On average, from 72 trips/day/4 sites with the distance from the site to disposal site is 3.3 – 5km. The fuel consumption norm of 8-ton truck is about 0.0018 tons of diesel/10km; therefore, the fuel consumption is approximately: 0.1 tons of diesel/day. The calculated pollutant load from the waste transportation is showed in Table 12.

**Table 12: Emission arising from transportation**

<table>
<thead>
<tr>
<th>No</th>
<th>Work item</th>
<th>Concentrations (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SO₂</td>
</tr>
<tr>
<td>1</td>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dyke</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>Khe Tria Outlet</td>
<td>0.01</td>
</tr>
<tr>
<td>3</td>
<td>Tan Dua bridge</td>
<td>0.01</td>
</tr>
<tr>
<td>4</td>
<td>My Thuan bridge</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td><strong>QCVN 05:2013/ BTNMT</strong></td>
<td><strong>0.35</strong></td>
</tr>
</tbody>
</table>

Concentration of SO₂ and CO in all of 4 sites is lower than QCVN 05:2013/ BTNMT. However, concentration of NOₓ in 03 sites is higher than 1.5 to 10 times except at Tan Dua Bridge. This impact will impact to local people who are living along the road. However, these are rural areas, low population density; transportation happen in short time, this impact is considered minor can be mitigated.

❖ **Noise**

Noise is generated from the operation of trucks, bulldozers excavator and electric generator. Noise levels of typical machinery and equipment are presented in Table 13.

**Table 13: Noise arising during the construction process**

<table>
<thead>
<tr>
<th>No</th>
<th>Type of machines</th>
<th>Noise level over source 15m (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Heavy trucks</td>
<td>70-96</td>
</tr>
<tr>
<td>2</td>
<td>Bulldozer</td>
<td>77-95</td>
</tr>
<tr>
<td>3</td>
<td>Excavator</td>
<td>75-86</td>
</tr>
<tr>
<td>4</td>
<td>Electric generator</td>
<td>72-82</td>
</tr>
<tr>
<td></td>
<td><strong>QCVN 26/2010/ BTNMT: 6:00 to 21:00 is 70 dBA; from 21:00 to 6:00 is 55 dBA;</strong></td>
<td></td>
</tr>
</tbody>
</table>

Noise level ranges from 70-90 dBA at the position which is 15m away from the source. Noise affects life of workers on construction site and local people. Thus, according to noise level calculation as distance to source, within the scope of 120m-250m, the noise volume is under the limit in QCVN 26:2010/ BTNMT. At all 04 sites, distance from nearest household to the
sites is 50-100m. Thus worker and local people will be affected from noise. However, impacts from noise are insignificant and infrequent, which mainly from operation time of machines and equipment, the impacts are mitigable.

- **Vibration**

  The vibration happens in a short time, with vibration level of 63-99 dBA at distance of 10m from the source at the construction site. As calculated, the vibration caused by bulldozers, excavator and electric generator at the distance of 50m is lower than allowable limit in QCVN 27:2010/BTNMT. Because distance from nearest household to the sites is 50-100m, worker is the mainly impact factor by vibration. Thus, this impact is small and can be mitigable.

2. **Water quality impacts**

- **Construction wastewater**: generated from concrete curing; machine repair and facility and material washing. The wastewater volume is approximately 0.5-1 m$^3$/day/site and occur in 1-2 weeks. This wastewater contains a large amount of sediment, suspended solids and may cause negative impacts on the rivers (19/5, Ngan Sau and Tri) if it is discharged directly into the environment. This impact is considered is small due to the short construction time and can be minimized.

- **Domestic wastewater**: generated from 5-10 workers for each work item. As calculated by the water supply 80 lit/person/day, the average volume of wastewater discharged is 0.4-0.8 m$^3$/day for each work item. Ingredients of wastewater include suspended sediment, oil, grease, organic content, soluble organic matters (like BOD5, COD), nutrients (Nitrogen, Phosphorous) and bacteria. If there is no system for collecting and treating daily wastewater, there will be a source of pollutant being discharged into the environment (rivers: 19/5, Ngan Sau and Tri). This will be a considerable pollution source, directly affecting living condition of workers and people around the suproject area. This impact is considered minor because Contractor will use local labor.

- **Runoff**: Surface runoff from heavy rains can sweep soil, sand, other materials and waste... toward water bodies, causing increased suspended solids in surface water source. large surface runoff usually occur in August and November (rainy season). Pollutants from surface runoff can affect living aquatic organisms in surface water ecosystem at 15/9; Ngan Sau and Tri rivers when turbidity is increased , affecting navigation on these rivers. However, the local ecosystem is simple and the so the impact will not be significant. The impact is low, short term, in small scale and can be mitigable by suitable schedule.

3. **Solid waste and hazardous waste generation**

- **Domestic solid waste**: There are 5-10 people working at each construction site. As calculated by 0.3 kg/person/day, the total volume of domestic solid waste is 1.5-3 kg/day for each work item. Domestic solid waste generated from construction of each work item is small volume but is the main pollution source due to the decaying of organic matters causing stinky smell, wastewater and infectious bacteria. However, construction sites of the subproject are at different and scattered areas and mostly far from residential areas the impact is considered to be low and can be mitigated.

- **Construction solid waste**: Construction solid waste is mainly debris from demolition of old works, cleared plants. The volume of excavated/dredged materials generated during construction is from 35 m$^3$ to 2293 m$^3$ depend on each work item. This waste will be transported to the disposal sites. This impact is considered minor.

- **Hazardous waste**: Hazardous waste generated are mainly originated from maintenance, oil replacement and repair of construction machines at the site. The total amount of hazardous waste generated in this phase is calculated about 0.5 kg/day and total of 1 - 2 kg for during
pre-construction phase. This volume is very small but waste oil may cause pollution water and soil environment. However this phase happen in a short time and the contractor is required not to carry out these activities on site, thus this impact is low.

4. Temporary impacts on transport in the region

During the pre-construction phase, temporary traffic congestion occurs on existing temporary roads. Constructor use truck under 8 tons with volume = 5 m$^3$. Thus, base on volume of waste and demolition time (6-12 day), number trips to transport is 72 trips/day/4 sites. Therefore, this impact is low.

4.1.2. Site-specific impacts

Specific impact in the pre-construction is land acquisition. Subproject is implemented in 05 communes: Xuan Vien, Huong Trach, Ky Son, Cam Phuc, Thien Cam town. Affected land areas are shown in Table 14.

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Affected land</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Subcomponent 1</strong></td>
<td>Thien Cam Town:</td>
</tr>
<tr>
<td></td>
<td>• Reconstruct:</td>
<td>• Affected household:</td>
</tr>
<tr>
<td></td>
<td>- Spillway</td>
<td>- 06 household only lost trees and crops because they plant on construction protection corridor illegally.</td>
</tr>
<tr>
<td></td>
<td>- Outlet</td>
<td>- There is no displaced households</td>
</tr>
<tr>
<td></td>
<td>• Repair and Upgrade</td>
<td>• Affected land: 7000 m$^2$ of construction protection corridor is affected, in which:</td>
</tr>
<tr>
<td></td>
<td>- Phuc-Long-Nhuong Dyke</td>
<td>- Permanently acquired land: 3600 m$^2$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Temporarily acquired land: 3400 m$^2$</td>
</tr>
<tr>
<td></td>
<td><strong>Cam Phuc commune:</strong></td>
<td>• Affected household:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 02 household only lost trees and crops because they plant on construction protection corridor illegally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- There is no displaced households</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Affected land: 1489 m$^2$ of construction protection corridor is affected permanently.</td>
</tr>
</tbody>
</table>

| 2   | **Subcomponent 2:**  | • Affected household: |
|     | Reconstruct: Khe Tria Outlet |   - 15 household only lost trees and crops because they plant on construction protection corridor illegally. |
|     | Repair and Upgrade the Channel |   - There is no displaced households |
|     |                       | • Affected land: 4300 m$^2$ of construction protection corridor is affected, in which: |
|     |                       |   - Permanently acquired land: 3000 m$^2$ |
|     |                       |   - Temporarily acquired land: 1300 m$^2$ |

| 3   | **Subcomponent 3:**  | • Affected household: |
|     | (a) Reconstruct Tan Dua bridge |   - 02 household only lost trees and crops because they plant on construction protection corridor illegally. |
|     |                       |   - There is no displaced households |
|     |                       | • Affected land: 1800 m$^2$ of construction protection corridor is affected, in which: |
In conclusion, total 47 households are affected by construction, in which: (i) 22 households are in Ky Son commune directly affected by land acquisition for reconstruction My Thuan bridge; ii) 25 households are indirectly affected by cultivation on land area managed by PC; (iii) none of households have to relocate and resettle; (iv) 12 households fall into vulnerable households (06 poor, 01 elderly alone and 05 women headed household households), of which 06 households are severely affected (loss more than 10% land). This impact is medium and mitigable by compensation policies in RAP report of the Ha Tinh subproject.

4.1.3. Safety risks related to Unexploded ordnance (UXO)

UXO left from the war still found in many parts of Viet Nam, these can cause casualties, accidents. Mortar shells, aerial bombs, and other unexploded ordnance may exit in the grounding the subproject areas, causing safety risk for the workers and properties of the subproject. Therefore, UXO detection and clearance must be carried out before commencement of any construction work. In this subproject there are two construction sites (Spillway & Outlet on Phuc-Long-Nhuong Dyke and Tan Dua Bridge) will be UXO.

4.2. Impacts in construction phase

4.2.1. Generic impacts

1. Air quality impacts

- Dust

Dust generation activities during the construction process include (i) excavation, earthwork, leveling, (ii) transportation of construction material and waste disposal. Estimated of excavation and backfilling volume from work items is shown in the Table 15.

Table 15: Excavation and backfilling volume of work items

<table>
<thead>
<tr>
<th>No</th>
<th>Work item</th>
<th>Excavation volume (m³)</th>
<th>Backfilling volume (m³)</th>
<th>Total (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dyke</td>
<td>15345</td>
<td>16187</td>
<td>31532</td>
</tr>
<tr>
<td>2</td>
<td>Khe Tria Outlet</td>
<td>22876</td>
<td>6394</td>
<td>29270</td>
</tr>
<tr>
<td>3</td>
<td>Tan Dua bridge</td>
<td>11287</td>
<td>10035</td>
<td>21322</td>
</tr>
<tr>
<td>4</td>
<td>My Thuan bridge</td>
<td>15911</td>
<td>11349</td>
<td>27260</td>
</tr>
</tbody>
</table>

(Source: FS, 2017)

The results of calculating the dust content arising from the excavation and backfilling activities during the construction of the subproject items are as follows:
Table 16: Concentration of dust arising from excavation, backfilling and ground leveling

<table>
<thead>
<tr>
<th>No</th>
<th>Name of works</th>
<th>Q_{dust} (kg/day)</th>
<th>Surface area (m²)</th>
<th>Impact volume (m³)</th>
<th>Average concentration (1h) (mg/m³)</th>
<th>Transport (1h) (mg/m³)</th>
<th>QCVN 05:2013/BTNMT (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dyke</td>
<td>0.5</td>
<td>8489</td>
<td>84890</td>
<td>0.2</td>
<td>1.1</td>
<td>0.3</td>
</tr>
<tr>
<td>2</td>
<td>Khe Tria Outlet</td>
<td>0.84</td>
<td>4300</td>
<td>43000</td>
<td>0.8</td>
<td>1.27</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Tan Dua bridge</td>
<td>0.21</td>
<td>1800</td>
<td>18000</td>
<td>0.4</td>
<td>0.36</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>My Thuan bridge</td>
<td>0.27</td>
<td>1250</td>
<td>12500</td>
<td>0.8</td>
<td>0.54</td>
<td></td>
</tr>
</tbody>
</table>

(i) The average amount of dust generated by excavation and ground leveling is from 0.2 ÷ 0.8 mg/m³. Within construction site scope, the dust concentration exceeds the permitted limit of QCVN 05: 2013 / BTNMT (0.3mg/m³), except at the construction site: spillway and outlet on Phuc-Long-Nhuong Dyke, concentration higher than 2.6 times. It can effect on air environment and worker. The affected area is concentrated mainly at the construction site; workers are directly affected persons. However, the construction works are at different locations and periods, dust occurs only during construction period. This impact is medium and mitiagable.

(ii) Material transportation, gathering and storing, transportation and disposal: emitted dust volume ranges from 0.32 – 1.27 mg/m³, estimated dust concentration is 1.15- 4 times higher than the allowable level in the QCVN 05:2013/BTNMT; specifically, dust concentration is 4 times higher under Khe Tria Outlet. Dust will impact to air environment and local people along the routes. Dust impact will last during construction time of work items, from 8-12 months. However, most of the construction sites are far from the residential areas and the inter-commune roads are in rural or mountainous areas with sparse population density, small scope at open space so the impact level is low and can be mitigated.

Air emission

Emission from construction

Construction of subproject items will use some construction machines and equipment. Most of the devices use Diezel, so the process of operation will emit pollutants such as: dust, CO, SO₂, NOₓ, etc. Emission arising from the operation of machines and equipment on the construction site depends on quantity, quality of construction machines, equipment and construction methods. Emission arising from the operation of machines and equipment on the construction site is shown in the Table 17

Table 17: Emission arising from construction site

<table>
<thead>
<tr>
<th>No</th>
<th>Work item</th>
<th>Concentrations (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SO₂</td>
</tr>
<tr>
<td>1</td>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dyke</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>Khe Tria Outlet</td>
<td>0.01</td>
</tr>
<tr>
<td>3</td>
<td>Tan Dua bridge</td>
<td>0.00</td>
</tr>
<tr>
<td>4</td>
<td>My Thuan bridge</td>
<td>0.01</td>
</tr>
</tbody>
</table>

QCVN 05:2013/BTNMT | 0.35 | 0.2  | 30 |

(Source: Environmental Impact Assessment report of Ha Tinh subproject)
Concentration of CO and SO$_2$ is lower than QCVN 05:2013/BTNMT. However, concentrations of NO$_x$ in all of 4 sites are higher than QCVN 05:2013/BTNMT 13-19 times. Overall, emission impact on the subproject area is minor and only affects construction workers in a short term (8-12 months at each construction site), and this can be mitigated by suitable methods.

**Emission from transport material**

Air emission generated from using diesel of trucks. On average, 50 trips/day/site with the distance from the site to disposal site are 1 – 25km depend on each work. The fuel consumption norm of 8-ton truck is about 0.0018 tons of diesel/10km; therefore, the fuel consumption is approximately: 0.1 tons of diesel/day. The calculated pollutant load from the waste transportation is showed in Table 18.

<table>
<thead>
<tr>
<th>No.</th>
<th>Work item</th>
<th>Concentrations (mg/m$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SO$_2$</td>
</tr>
<tr>
<td>1</td>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dyke</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>Khe Tria Outlet</td>
<td>0.01</td>
</tr>
<tr>
<td>3</td>
<td>Tan Dua bridge</td>
<td>0.01</td>
</tr>
<tr>
<td>4</td>
<td>My Thuan bridge</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>QCVN 05:2013/ BTNMT</td>
<td>0.35</td>
</tr>
</tbody>
</table>

(Source: Environmental Impact Assessment report Ha Tinh province subproject)

Concentration of SO$_2$ and CO in all of 4 sites is lower than QCVN 05:2013/BTNMT. However, concentration of NO$_x$ in 03 sites is higher than 1.5 to 10 times except at Tan Dua Bridge (because of lack of waste). However, most of the construction sites are far from the residential areas and the inter-commune roads are in rural or mountainous areas with sparse population density, small scope at open space so the impact level is low and can be mitigated

**Noise**

Noise is generated mainly from construction machines and equipment (excavator / bulldozer, electric generator, mobile crane...). Noise levels of typical machinery and equipment are presented in the following Table 19.

<table>
<thead>
<tr>
<th>No.</th>
<th>Machines, equipment</th>
<th>Noise level with 1.5m far from source (dBA)</th>
<th>Noise level with 50m far from source (dBA)</th>
<th>Noise level with 100m far from source (dBA)</th>
<th>Noise level with 200m far from source (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8-ton tipper truck</td>
<td>Min 72 Max 84</td>
<td>Min 41.5 Max 53.5</td>
<td>Min 35.5 Max 47.5</td>
<td>Min 29.5 Max 41.5</td>
</tr>
<tr>
<td></td>
<td>Bulldozer</td>
<td>Min 93 Max 62.5</td>
<td>Min 41.5 Max 53.5</td>
<td>Min 35.5 Max 47.5</td>
<td>Min 29.5 Max 41.5</td>
</tr>
<tr>
<td></td>
<td>Excavator</td>
<td>Min 72 Max 84</td>
<td>Min 41.5 Max 53.5</td>
<td>Min 35.5 Max 47.5</td>
<td>Min 29.5 Max 41.5</td>
</tr>
<tr>
<td></td>
<td>Concrete mixer</td>
<td>Min 75 Max 88</td>
<td>Min 42.5 Max 57.5</td>
<td>Min 38.5 Max 51.5</td>
<td>Min 32.5 Max 45.5</td>
</tr>
<tr>
<td></td>
<td>Electric generator</td>
<td>Min 72 Max 82</td>
<td>Min 41.5 Max 51.5</td>
<td>Min 35.5 Max 45.5</td>
<td>Min 29.5 Max 39.5</td>
</tr>
<tr>
<td></td>
<td>Mobile crane</td>
<td>Min 76 Max 87</td>
<td>Min 45.5 Max 56.5</td>
<td>Min 39.5 Max 50.5</td>
<td>Min 33.5 Max 44.5</td>
</tr>
<tr>
<td></td>
<td>QCVN 26:2010/BTNMT (6-21h)</td>
<td>70 dBA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: QCVN 26:2010/BTNMT: National Technical Standard on Noise (6h - 21h)
Impacts of noise in the construction phase are marginal and insignificant. The workers are affected by noise during construction phase. These impacts don’t effect on local people because the construction location far from the nearest households about 50-100m. The noise impact is not great and frequent, only intermittent at certain period during operation of machines and equipments. However, this noise impact can be mitigable by suitable methods.

Vibration

The vibration is caused by machines and vehicles including excavator / bulldozer, electric generator, mobile crane. During the excavation of earthwork, transportation, leveling, compaction. Vibration level is about 63-99 dBA at distance of 10m from the sources. It will impact on worker, at the distance of 100m is lower than allowable limit in QCVN 27:2010/BTNMT. Thus, it is not impact to local people. This impact is low and can be mitigable.

2. Water quality impacts

- Construction wastewater: generated from concrete curing; machine repair and facility and material washing. The wastewater volume ia approximately 1.5 m³/day/site. This wastewater contains a large amount of sediment, suspended solids and may cause negative impacts on the receiving waterbody if it is discharged directly into the environment. However, in fact, this wastewater is re-used for curing concrete and watering the haul road and construction site. Therefore, the impacts caused by this wastewater source will be insignificant.
- **Domestic wastewater:** generated from 20-30 workers for each work item. As calculated by the water supply 80 lit/person/day, the average volume of wastewater discharged is 1.6-2.4 m$^3$/day for each work item. Ingredients of wastewater include suspended sediment, oil, grease, organic content, soluble organic matters (like BOD$_5$, COD), nutrients (Nitrogen, Phosphorous) and bacteria. If there is no system for collecting and treating daily wastewater, there will be a source of pollutant being discharged into the environment. This will be a considerable pollution source, directly affecting living condition of workers and people around the suproject area. This impact is considered minor and moderate depending on each subproject area.

- **Runoff:** Surface runoff from heavy rains can sweep soil, sand, other materials and waste... toward water bodies, causing increased suspended solids in surface water source. large surface runoff usually occur in September and October (rainy season). Pollutants from surface runoff can affect living aquatic organisms in surface water ecosystem at 15/9, Ngan Sau and Tri rivers when turbidity is increased, affecting navigation on these rivers. However, the local ecosystem is simple so the impact will not be significant. The impact is low, short term, in small scale and can be mitigable by suitable methods.

The amount of runoff is calculated on basis of formula $W = X \times S$ (X: maximum rainfall is 350mm; S: area of construction site). Hence, total amount of runoff at construction sites

<table>
<thead>
<tr>
<th>List of works</th>
<th>Total amount of runoff (m$^3$/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dyke</td>
<td>2971</td>
</tr>
<tr>
<td>Khe Tria Outlet</td>
<td>1505</td>
</tr>
<tr>
<td>Tan Dua bridge</td>
<td>630</td>
</tr>
<tr>
<td>My Thuan bridge</td>
<td>438</td>
</tr>
</tbody>
</table>

3. **Solid waste and hazardous waste generation**

- **Domestic solid waste:** There are 20-30 people working at each construction site. As calculated by 0.3 kg/person/day, the total volume of domestic solid waste is 6-9 kg/day for each work item. Domestic solid waste generated from construction of each work item is small volume but is the main pollution source due to the decaying of organic matters causing stinky smell, wastewater and infectious bacteria. However, construction sites of the subproject are at different and scattered areas and mostly far from residential areas the impact is considered to be low and can be mitigated.

- **Construction solid waste:** Construction solid waste is mainly debris from demolition of old works, cleared plants, excavated soil, dredged materials, packaging materials, pieces of irons, steels… at the site. The volume of excavated/dredged materials generated during construction is from 150 m$^3$ to 2300 m$^3$ for each work item. This waste will be transported to the disposal sties. This impact is considered minor.

- **Hazardous waste:** Hazardous waste generated are mainly originated from maintenance, oil replacement and repair of construction machines at the site. The total amount of hazardous waste generated in this phase is calculated about 0.5 kg/day and total of 104 - 156 kg for during construction phase for each work item. This volume is very small but waste oil may cause pollution water and soil environment. However, this type of waste will be collected, managed and processed in accordance with regulation for collection and management of hazardous waste. This impact can be assessed as minor.
4. Impacts on physical cultural resources

Implementation of the subproject at some phases will require soil excavation at different place as Tan Dua bridge (50m far from old bridge). When performing these activities, there will be chances to find remains or antiques. Possibility of discovering valuable antiques is average. When the antiques are discovered, the chance find procedures (ECOPs) shall be applied. This impact is low and can be mitigable.

4.2.2. Site-specific impacts

❖ Impacts on agricultural production activities of local people

These impacts might occur during construction of the following work items: (1) Spillway & Outlet on Phuc-Long-Nhuong Dyke; and (2) Khe Tria Outlet.

The construction areas are next to the rice field, dust from transportation, excavation and backfilling will affect the health of local people during rice cultivation as well as the development of rice. If not well gather and transport material, when it rain or heavy winds happen, dust and material will spill over the field, affecting the growth of rice.

However, the subproject area has many infield routes, the duration of construction takes place within 8-12 months, the impact is local and in a short time, so the impact is insignificant and can be minimized.

❖ Disruption of water supply

These impacts might occur during construction of the spillway and outlet on Phuc-Long-Nhuong dyke which is responsible for supplying water for 700ha (Cam Phuc commune and Thien Cam town). Reconstruction is likely to prevent irrigation water supply, special in the growth period of rice (from February to May and July to September), damaging economic aspects of local people. The impact level is medium but it can be minimized by applying technical measures and construction time arrangement.

❖ Impacts on water environment and aquatic communities

During the construction of Spillway & Outlet on Phuc-Long-Nhuong Dyke and Tan Dua bridge, and My Thuan bridge there will effect to water environment and aquatic communities Ngan Sau river and Tri river.

The process can increase turbidity in the river. The runoff around the subproject area will be accompanied with pollutants including construction material, soil, sand, grease and oil flowing into the river, affecting the water quality of Gia Hoi Rivers and Ngan Sau river.

In addition, during the construction, the flow cross-section can be reduced and thus leads to the increased the flow rate, especially at the time of heavy rain, which can lead to the erosion of the riverbank at the downstream.

Another factor bound to cause water source pollution is a small amount of domestic waste and wastewater (1.6-2.4 m$^3$/day) from workers’ camps. This source of pollutants, if discharged directly into river, would cause organic pollution (BOD, COD) and nutrient pollution (N, P) to the receiving waters.

Water of the subproject area does not have any species with economic value, mainly small shrimps and crabs.

The impacts only happen during construction period which last about 8 - 12 months for each embankment and would stop by operation. The level of the impacts, therefore, is low temporary and could be mitigated by good construction practices.

❖ Risk of subsidence of outlet on Phu-Long-Nhuong Dyke and Khe Tria outlet
During the under construction, if the heavy rain happens causing big flood, damage work items as sunken (spillway, outlet and dyke), eroded (wing wall of spillway and outlet, dyke, channel, bridge), broken (valve of outlet, piers of bridge). These impacts are localized, short term and avoidable via appropriate design and good construction practices.

❖ Risk of falling into rock

In dry season, water level is low, river bed has many original rocks. If careless and not equipped labor protection, workers may be injured by falls into rocks from elevation 2.5m. Location can occur at My Thuan bridge.

4.2.3. Impacts on sensitive receptors

The construction of the different items of subproject will likely impact some sensitive receptors located in close proximity to the construction sites: (i) Spillway & Outlet on Phuc-Long-Nhuong Dyke; and (ii) Tan Dua bridge.

<table>
<thead>
<tr>
<th>No.</th>
<th>Sensitive receptors</th>
<th>Location/ Description</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Duoi Church, Cam Phuc commune, Cam Xuyen district</td>
<td>Location: Duoi Church is situated in the side of the PR connecting road 551 through Cam Duong commune to Phuc Long Nhuong dike.</td>
<td>- Dust, noise and vibration during transportation impact on spiritual activities of about 400 Christian of Duoi Church and 500 Christian of Huong Trach church. - Traffic accidents can occur in the collision with construction material transportation vehicles - Concentrating workers can also cause conflicts between workers and Catholics, resulting in serious consequences, but this impact can be minimized.</td>
</tr>
<tr>
<td>2</td>
<td>Huong Trach Church of Tan Hoi Parish, Huong Trach commune, Huong Khe district</td>
<td>The Church is located in the side of NH.15, opposite to the construction site of Tan Dua bridge. The distance from the gate of the church to the construction site is 110m</td>
<td></td>
</tr>
</tbody>
</table>

These impacts on two construction sites are insignificant and can be minimized by arranging reasonable transportation and construction schedule.

4.2.4. Social impacts

❖ Workers gathering

During the construction period at the subproject area, with the concentration of workers will cause some disturbance in the area, including:

- Increase demand for commodity consumption in the region such as food and utensils.
- Arise relationships between workers at the construction site and local people. The possibility of conflicts between workers and local people will be higher if workers from other regions do not understand the customs of local people. There is also the potential for arising conflicts between workers at nearby construction sites.

- During the construction period, the concentration of large numbers of workers will increase the risk of social evils (gambling, theft, drug abuse, prostitution and so on.). The situation of security and order will become more complex and difficult to manage, making it difficult for the local police force.

In addition, the concentration of workers in the construction site is the reason for emergence and spread of disease outbreaks through water (cholera, typhoid, diarrhea) or intermediate factors (malaria, hemorrhaging, etc.) as well as social diseases (gonorrhea, syphilis, HIV, etc.), affecting the health of the local community. This impact is likely to occur without management and control measures.

This impact is small and can be minimized.

❖ Safety and health of workers and local people

The increased capacity of vehicles involved in the transportation of construction materials and heavy machines will affect the safety of drivers and traffic participants on transportation routes.

Discharge of sand and noise from vehicles can cause adverse effect on human health either indirectly or directly through the respiratory tract.

In addition, in the stage of leveling and construction: incidents of fire and explosion of temporary power system, fuel storage, etc. The construction process of excavation and backfilling roadbase can cause landslide, subsidence of adjacent works, affecting the groundwater / underground water level.

Besides, the subproject Owner as well as the construction Contractor will work closely with the local authorities in the subproject area and relevant agencies to promptly resolve problems arising in accordance with the State’s regulations and in accordance with the aspirations of local people.

This impact is small and can be minimized.

4.3. Impacts in operation phase

❖ Road Safety during the operation of Va Ranh, Dam and Dong Yen 3 bridges and Ha Rieng road

Road safety is likely to be the key impacts during operation of Tan Dua and My Thuan bridge during the first few years when transportation of rural population (bicycles, carts, etc.) are mixed with motor vehicle operations (cars, motorcycles, trucks, etc.) and levels of traffic accident could increase. Experience in the country suggested that this can be managed by improving knowledge of local people on road use regulations and practices as well as monitoring and enforcement of driver speed and behavior. In the longer term when traffic volume is high, generation of dust, exhausted gases, noise, and vibration could be an additional issue but this could be mitigated through long term planning.

❖ Induced development

There are various social impacts that may occur due to land use changes and/or induced development (increase solid waste, illegal use of right of ways, etc.); however, this is likely to be a long-term issue. During the first few years, these impacts will be minor however improving people knowledge on socio-economic development opportunity and risks related to social issues could help reducing potential negative impacts to local population.
4.4. Impacts from incidents and risks

4.4.1. Construction phase

❖ Labor accidents

In general, labor accidents may happen at any stage during construction phase, the causes include:

- Workers working on the river (constructing embankment, constructing river-cross bridge) are at risk of being drowned due to their carelessness or tiredness or not following regulations on occupational safety when performing their construction activities at these areas.
- Outdoor workers exposed to hot weather (in summer, temperature can reach 39°C - 40°C).
- Environmental pollution may cause fatigue, dizziness or fainting for workers during their work.
- Operations of machines and equipment used for loading/unloading materials and equipment, dredging, excavation., construction and transport of materials.
- Land slide at deep excavation sites.
- Injuries due to insect bites, broken grass when working in the bush during site clearance,
- Extreme weather events such as heavy rain, storms, flush flood, or extreme hot weather.
- Dismantling of the existing bridges: accidents may happen if people travel on the bridge being dismantled.

Generally, the risk of labor accident on construction sites is minor and can be mitigated by suitable solution such as training on occupational safety before and during the construction process and provision of sufficient protective equipment for workers.

❖ Traffic accidents

The fundamental causes of most traffic accidents on construction site are the failure in implementation of safety working system and workers training method. However, the most common direct cause is a combination of one of the following factors:

- Limited driving capacity;
- Carelessness or negligence of special dangerous sources, such as working near power lines or excavated/backfilled sites;
- Inadequate maintenance of means of transport;
- Overload or weak load;
- Congestion at construction site;
- Poor traffic site;
- Lack of appropriate roads (bypass roads) or rugged road surface.

This impact may happen to local people and worker. Especially when construc Tan Dua bridge because one side of it connect to Nation highway NH15 which has many means of transportation. This impact is medium and mitigable.

❖ Fire, explosion and leakage of fuel

Fire and explosion may occur in the case of transport and storage of fuel, or lack of safety of the temporary power supply system, causing the loss of life and damage to property during the construction process. The specific causes are identified as follows:

- The temporary fuel and material warehouse (gas, DO oil, FO oil, welding gas, etc.) are the
source of fire and explosion. The occurrence of such incidents can cause serious damage to people, society, economy and the environment.

- Fire risk may happen when operating construction machineries, welding and vehicles using gasoline and diesel without compliance with fire regulations.

- The subproject owner will implement the fire prevention and strictly comply with measures to prevent leakage, fire or explosion. The fire prevention shall be done regularly to minimize the possibility of incidents and the levels of impact.

In general, for the subproject, the fire and explosion risk is low because construction sites mainly on river, at open space and far from residential areas (100 - 300m). If there is any fire and explosion incidence, it will only affect workers but this impact is at low level, in small scale and can be mitigable by suitable methods.

4.4.2. Operational phase

- **Natural disasters, storm, flooding**
  
  Incidents caused by natural disaster, storms and floods during the phase of using roads, embankments, bridges, dams, have possibility of landslides, earthquakes and so on. That causes damage to works and property of the people. Design has calculated climate weather’s the abnormalities in the past, thus the impact of this situation is low.

- **Erosion, subsidence of work, blocking of the water flow**
  
  In the process of putting the works into operation, there is the possibility of embankment landslide, the edge of the road due to floods, earthquakes, sea waves, smashing, poor construction works, unensured design. This can cause damage of works if works are not solid and design is not guaranteed. This causes damage to works and property of local people. thus the impact of this situation is medium

5. MITIGATION MEASURES

5.1. Mitigation measures during preparation phase

5.1.1. Common mitigation measures

Applying the ECOPs (see 5.2.1)

5.1.2. Site specific mitigation measures (land acquisition)

During the subproject preparation, the Resettlement Consultant, Technical Consultant and PPMU have worked together, considering technical requirements and construction method, to reduce resettlement on the principle of (i) mitigating impacts from land acquisition for households in the subproject area; and (ii) prioritizing the construction option which requires the smallest land acquisition area.

Total cost for compensation, support and resettlement of the 8 work items is 651,185,600 VND, equivalent to 28,687 USD.

The estimated cost for land clearance and resettlement is calculated based on provisions set by People Committee of Ha Tinh province and the policies determined by the World Bank. The Detailed mitigation measures for land acquisition are provided in the RP of the subproject.

5.1.3. Mitigation of UXO Risks

The subproject owner (PPMU) will sign a contract with the military civil engineering agency or Ha Tinh Provincial Military Base for UXO detection and clearance at the construction sites. UXO clearance will be executed right after the completion of site compensation and before the implementation of demolition and ground leveling. The estimated cost for UXO constructions Spillway & Outlet on Phuc-Long-Nhuong Dyke and Tan Dua bridge are
approximately 200,000,000 VND and 28,896,000 VND, respectively (8,811 USD and 1,273 USD). No construction activity will be allowed until the UXO clearance is completed.

5.2. Mitigation measures during construction phase

5.2.1. Common mitigation measures

As part of the Environmental and Social Management Plan (ESMP) for the subproject these general measures have been translated into a standard environmental specification to be incorporated into bidding and contract documents. These are referred to as Environmental Codes of Practice (ECOPs), and will be applied to mitigate typical impacts of the subproject’s civil works during the pre-construction and construction phase.

The ECOPs describe typical requirements to be undertaken by contractors and supervised by the construction supervision consultant during construction. The ECOPs will be incorporated into the bidding and contract documents (BD/CD) annexes. The measures identify typical mitigation measures for the following aspects:

- Impacts of dust;
- Air pollution;
- Noise and vibration;
- Water pollution;
- Solid waste;
- Hazardous waste;
- Traffic management;
- Restoration of affected areas;
- Worker and public Safety;
- Communication with local communities about subproject environmental issues;
- Health and Safety for workers and the public;
- Chance finding procedures
### Table 22: Common mitigation measures

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<thead>
<tr>
<th>Environmental and social issues</th>
<th>Mitigation measures</th>
<th>Applicable National Regulations, Standards</th>
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</tr>
</thead>
</table>
| 1. Impacts of dust             | - The Contractor is responsible for ensuring compliance with relevant Vietnamese legislation with respect to ambient air quality.   
- The Contractor shall ensure that dust generation is mitigated and will not annoy local people and implement measures to control dust concentration in order to maintain safe working place and minimize disturbance to surrounding residences/houses.   
- Material loads shall be suitably secured during transportation to prevent the scattering of soil, sand, materials or dust.  
- Exposed soil and material stockpiles shall be protected against wind erosion and the location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors  
- Dust masks should be used where dust levels are excessive. | - Decision No. 35/2005/QD-BGTVT on inspection of quality, technical safety and environmental protection  
- QCVN 05: 2013/MONRE: National technical regulation on ambient air quality | Contractor  
PPMU, CSC |
| 2. Air pollution               | - All vehicles must comply with Vietnamese regulations controlling allowable emission limits of exhaust gases.   
- Vehicles in Vietnam must undergo a regular emissions check and get certified named: “Certificate of conformity from inspection of quality, technical safety and environmental protection” following Decision No. 35/2005/QD-BGTVT;   
- There should be no burning of waste or construction materials (for example: asphalt, etc.) on site. | - Decision No. 35/2005/QD-BGTVT on inspection of quality, technical safety and environmental protection  
- QCVN 05: 2013/MONRE: National technical regulation on ambient air quality | Contractor  
PPMU, CSC |
| 3. Noise and vibration         | - The contractor is responsible for compliance with the relevant Vietnamese legislation with respect to noise and vibration.   
- All vehicles must have appropriate “Certificate of conformity from inspection of quality, technical safety and environmental protection” following Decision No. 35/2005/QD-BGTVT; to avoid exceeding noise emission from poorly maintained machines. When needed, measures to reduce noise to acceptable levels must be implemented and could include silencers, mufflers, acoustically dampened panels or placement of noisy machines in acoustically protected areas. | - QCVN 26:2010/BTNMT: National technical regulation on noise  
- QCVN 27:2010/BTNMT: National technical regulation on vibration | Contractor  
PPMU, CSC |
### Environmental and social issues

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</thead>
<tbody>
<tr>
<td>- Avoiding or minimizing transportation through or processing material in community areas (like concrete mixing).</td>
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<td>PPMU, CSC</td>
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<tr>
<td>- The Contractor must be responsible for compliance with the relevant Vietnamese legislation relevant to wastewater discharges into watercourses.</td>
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<tr>
<td>- Portable or constructed hygienic toilets must be provided on site for construction workers. Wastewater from toilets as well as kitchens, showers, sinks, etc. shall be discharged into a conservancy tank for removal from the site or discharged into local sewerage systems; there should be no direct discharges to any water body.</td>
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<tr>
<td>- Wastewater over standards set by relevant Vietnam technical standards/regulations must be collected in a conservancy tank and removed from site by licensed waste collectors.</td>
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<tr>
<td>- Implement measure to collect, redirect or block municipal wastewater disposed from surrounding houses to properly dispose and ensure that local blocking or flooding are minimized.</td>
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<tr>
<td>- Before construction, all necessary wastewater disposal permits/licenses and/or wastewater disposal contract have been obtained.</td>
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<tr>
<td>- At completion of construction works, wastewater collection tanks and septic tanks shall be safely disposed or effectively sealed off.</td>
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<td><strong>5. Solid waste</strong></td>
<td>- Decree No. 38/2015/ND-CP on solid waste management</td>
<td>- Contractor</td>
</tr>
<tr>
<td>- Before construction, a solid waste control procedure (storage, provision of bins, site clean-up schedule, bin clean-out schedule, etc.) must be prepared by Contractors and it must be carefully followed during construction activities.</td>
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<td>PPMU, CSC</td>
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<tr>
<td>- Before construction, all necessary waste disposal permits or licenses must be obtained.</td>
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<tr>
<td>- Measures shall be taken to reduce the potential for litter and negligent behavior with regard to the disposal of all refuse. At all places of work, the Contractor shall provide litter bins, containers and refuse collection facilities.</td>
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<tr>
<td>- Solid waste may be temporarily stored on site in a designated area approved by the Construction Supervision Consultant and relevant local authorities prior to collection and disposal through a licensed waste collector, for example, local environment and sanitation companies.</td>
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<tr>
<td>Environmental and social issues</td>
<td>Mitigation measures</td>
<td>Applicable National Regulations, Standards</td>
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<tr>
<td>- Waste storage containers shall be covered, tip-proof, weatherproof and scavenger proof.</td>
<td>- No burning, on-site burying or dumping of solid waste shall occur.</td>
<td>- Decree No. 38/2015/ND-CP dated 24/04/2015 on waste and scrap management</td>
</tr>
<tr>
<td>- Recyclable materials such as wooden plates for trench works, steel, scaffolding material, site holding, packaging material, etc shall be collected and separated on-site from other waste sources for reuse, for use as fill, or for sale.</td>
<td>- If not removed off site, solid waste or construction debris shall be disposed of only at sites identified and approved by the Construction Supervision Consultant and included in the solid waste plan.</td>
<td>- Circular No. 36/2015/TT-BTNMT on management of hazardous substance</td>
</tr>
<tr>
<td>- If not removed off site, solid waste or construction debris shall be disposed of only at sites identified and approved by the Construction Supervision Consultant and included in the solid waste plan.</td>
<td>- Decree No. 38/2015/ND-CP dated 24/04/2015 on waste and scrap management</td>
<td>Contractor</td>
</tr>
<tr>
<td>6. Hazardous waste</td>
<td>- The removal of asbestos-containing materials or other toxic substances shall be performed and disposed of by specially trained and certified workers.</td>
<td>- Circular No. 36/2015/TT-BTNMT on management of hazardous substance</td>
</tr>
<tr>
<td>- Used oil and grease shall be removed from site and sold to an approved used oil recycling company.</td>
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<tr>
<td>- Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machines shall be collected in holding tanks and removed from site by a specialized oil recycling company for disposal at an approved hazardous waste site.</td>
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<tr>
<td>- Unused or rejected tar or bituminous products shall be returned to the supplier’s production plant.</td>
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<tr>
<td>- Relevant agencies shall be promptly informed of any accidental spill or incident.</td>
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<td>- Appropriate communication and training programs should be put in place to prepare workers to recognize and respond to workplace chemical hazards.</td>
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<tr>
<td>- Prepare and initiate a remedial action following any spill or incident. In this case, the contractor shall provide a report explaining the reasons for the spill or incident, remedial action taken, consequences/damage from the spill, and proposed corrective actions.</td>
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<tr>
<td>7. Traffic management</td>
<td>- Before construction, carry out consultations with local government and community.</td>
<td>- Law on traffic and transport No. 23/2008/QH12</td>
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<tr>
<td>- Significant increases in number of vehicle trips must be included in a</td>
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</table>
### Environmental and social issues

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| construction plan before approved. Routings, especially of heavy vehicles, need to take into account sensitive sites such as schools, hospitals, and markets. | - Decree 46/2016/ND-CP on administrative penalty for traffic safety violation  
- Law on construction No. 50/2014/QH13;  
- Circular No. 22/2010/TT-BXD on regulation on labor safety in construction | Implementation  
- Contractor -  
- Compliance reported by CSC |
| - Installation of lighting at night must be done if this is necessary to ensure safe traffic circulation. | | |
| - Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warning. | | |
| - Employing safe traffic control measures, including road signs and flag persons to warn of dangerous conditions | | |
| - Avoid material transportation for construction during rush hour. | | |
| - Passageways for pedestrians and vehicles within and outside construction areas should be segregated and provide for easy, safe, and appropriate access. Signpost shall be installed appropriately in both water-ways and roads where necessary. | | |
| **8. Restoration of affected areas** | - Decree No. 167/2013/ND-CP on administrative penalty for violations related to social security, order and safety issues | - Contractor -  
- Compliance reported by CSC |
| - Temporary acquired areas to make warehouse, cable pulling site, etc. are used for a short period of time, site facilities, workers’ camps, stockpiles areas, working platforms and any areas temporarily occupied during construction of the subproject works shall be restored using landscaping, adequate drainage. | | |
| - All affected areas shall be landscaped and any necessary remedial works shall be undertaken without delay. These works may be green-spacing, roads, bridges and other works to original existing etc. | | |
| - Soil contaminated with chemicals or hazardous substances shall be removed and transported and buried in waste disposal areas in accordance with regulations;  
- Restore all roads caused by the subproject activities to their original state or better. | | |
| **9. Worker and public Safety** | - Decree No. 167/2013/ND-CP on administrative penalty for violations related to social security, order and safety issues | - Contractor -  
- Compliance reported by CSC |
| - Contractor shall comply with all Vietnamese regulations regarding worker safety.  
- Prepare and implement action plan to cope with risk and emergency.  
- Preparation of emergency aid service at construction site. | | |

**Consultant:** IAC Viet Nam
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<tr>
<td></td>
<td>- Training workers on occupational safety regulations</td>
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<td>- If blasting is to be used, additional mitigation measures and safety precautions must be outlined in the ESMP.</td>
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<td></td>
<td>- Ensure that ear pieces are provided to and used by workers who must use noisy machines such as piling, explosion, mixing, etc., for noise control and workers protection.</td>
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<td></td>
<td>- During demolition of existing infrastructure, workers and the general public must be protected from falling debris by measures such as chutes, traffic control, and use of restricted access zones;</td>
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<td></td>
<td>- Install fences, barriers, dangerous warning/prohibition site around the construction area which showing potential danger to public people;</td>
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<td></td>
<td>- The contractor shall provide safety measures as installation of fences, barriers warning signs, lighting system against traffic accidents as well as other risk to people and sensitive areas</td>
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<tr>
<td>10. Communication with local communities about subproject environmental issues</td>
<td>- Maintain open communications with the local government and concerned communities; the contractor shall coordinate with local authorities (leaders of local wards or communes) for agreed schedules of construction activities at areas nearby sensitive places.</td>
<td>- Decree No. 167/2013/ND-CP on administrative penalty for violations related to social security, order and safety issues</td>
<td>Contractor</td>
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<td>- Copies in Vietnamese of these ECOPs and of other relevant environmental safeguard documents shall be made available to local communities and to workers at the site.</td>
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<td>PPMU, CSC</td>
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<td>- Disseminate subproject information to affected parties (for example local authority) through community meetings before construction commencement;</td>
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<td>- Provide a community relations contact from whom interested parties can receive information on site activities, subproject status and subproject implementation results;</td>
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<td>- Provide all information, especially technical findings, in a language that is understandable to the general public and in a form of useful to interested citizens and elected officials through the preparation of fact sheets and disclosure, when major findings become available during subproject phase;</td>
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<td>- Monitor community concerns and information requirements as the subproject progresses;</td>
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</table>
**Environmental and social issues**

<table>
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<tr>
<th>Mitigation measures</th>
<th>Applicable National Regulations, Standards</th>
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<tbody>
<tr>
<td>- Respond to telephone inquiries and written correspondence in a timely and accurate manner;</td>
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<tr>
<td>- Provide technical documents and drawings to PC’s community, especially a sketch of the construction area and the ESMP of the construction site;</td>
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<tr>
<td>- Notification boards shall be erected at all construction sites providing information about the subproject, as well as contact information about the site managers, environmental staff, health and safety staff, telephone numbers and other contact information so that any affected people can have the channel to voice their concerns and suggestions.</td>
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**11. Health and Safety for workers and the public**

- HIV/AIDS within 2 weeks prior to the commencement of packages for construction items lasting at least 6 months.
- Provide training in first-aid skill and first-aid kit to workers and site engineer
- Regularly exam worker’s health to ensure occupational health
- Provide workers with PPE such as masks, gloves, helmets, shoes/boots, goggles, safety belt, etc. and enforce wearing during working especially working at heights and in dangerous areas.
- Limit or avoid working in extreme weather conditions, e.g. too hot, heavy rain, strong wind, and dense fog.
- Provision of proper eye protection such as welder goggles and/or a full-face eye shield for all personnel involved in, or assisting, welding operations. Additional methods may include the use of welding barrier screens around the specific work station (a solid piece of light metal, canvas, or plywood designed to block welding light from others). Devices to extract and remove noxious fumes at the source may also be required.
- Special hot work and fire prevention precautions and Standard Operating Procedures (SOPs) should be implemented if welding or hot cutting is undertaken outside established welding work stations, including ‘Hot Work Permits, stand-by fire extinguishers, stand-by fire watch, and maintaining the fire watch for up to one hour after welding or hot cutting has terminated. Special procedures are required for hot work on tanks or vessels that have contained flammable materials.
- Safely install power lines at offices and in construction sites and do not lay

- Directive No. 02/2008/CT-BXD on labor safety and sanitation in construction agencies;
- Circular No. 22/2010/TT-BXD on regulation on labor safety in construction
- QCVN 18:2014/BXD: Technical regulation on safety in construction

- Contractor  
  PPMU, CSC
### Environmental and social issues

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<th>Applicable National Regulations, Standards</th>
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<tbody>
<tr>
<td>connectors on the ground or water surface. Electric wires must be with plugs. Place outdoor electric panels in protection cabinets.</td>
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<tr>
<td>- Limit vehicle speed at 5km/hour at construction site and 20km/h on transportation routes across local resident areas.</td>
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<tr>
<td>- Install fences, barriers for dangerous warning/prohibition sites around the construction area which show potential danger to the public.</td>
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<tr>
<td>- Provide safety measures as installation of fences, barriers warning signs, lighting system against traffic accidents as well as other risk to people and sensitive areas.</td>
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<td>- Provide sufficient lighting when carrying out construction activities at night.</td>
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<tr>
<td>- Locate noise-generating sources and concrete mixing plants far enough from and downwind of residential areas and camps.</td>
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<tr>
<td>- Store fuels and chemicals in areas with impermeable ground, roofs, surrounding banks, and warning signs at least 50 m far from and downwind of residential areas and the camps.</td>
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<tr>
<td>- Provide training in fire-fighting to workers and fire-extinguishers for the camps.</td>
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<tr>
<td>- Prepare an emergency plan for chemical/fuel spill incident risk before construction begins.</td>
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<tr>
<td>- Provide the camps with sufficient supplies of clean water, power, and sanitary facilities. There must be at least one toilet compartment for every 30 workers, with separate toilets for males and females. Workers’ beds must be provided with mosquito nets so as to prevent dengue fever. Temporary tents will be unacceptable.</td>
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<tr>
<td>- Clean camps, kitchens, baths, and toilets and sanitize regularly, and keep good sanitation. Provide dustbins and collect waste daily from the camps. Clear drainage ditches around the camps periodically.</td>
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<td>- Stop all construction activities during rains and storms, or upon accidents or serious incidents.</td>
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<td>- If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or</td>
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<tr>
<td>12. Chance finding procedures in case of finding objects with</td>
<td>- Law on cultural heritage No. 28/2001/QH10;</td>
<td>- Contractor, supervising consultant</td>
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Consultant: IAC Viet Nam
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<tr>
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<th>Responsibility</th>
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<tr>
<td>historical or cultural values</td>
<td>construction, the Contractor shall:</td>
<td>- Amended and supplemented Law on cultural heritage No. 32/2009/QH12; - Decree No 98/2010/ND-CP dated 21/09/2010 on guideline to implement Cultural Heritage Law.</td>
<td>cooperates to implement</td>
</tr>
<tr>
<td></td>
<td>- Stop the construction activities in the area of the chance find; - Delineate the discovered site or area; - Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Department of Culture and Information takes over; - Notify the Construction Supervision Consultant who in turn will notify responsible local or national authorities in charge of the Cultural Property of Viet Nam (within 24 hours or less); - Relevant local or national authorities would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values; - Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage; - If the cultural sites and/or relics are of high value and site preservation is recommended by the professionals and required by the cultural relics authority, the Project’s Owner will need to make necessary design changes to accommodate the request and preserve the site; - Decisions concerning the management of the finding shall be communicated in writing by relevant authorities; - Construction works could resume only after permission is granted from the responsible local authorities concerning safeguard of the heritage.</td>
<td>- - Cultural Information Department - Contractor, Owner and local Authority</td>
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</tbody>
</table>
5.2.2. Site specific mitigation measures

Table 23 presents site-specific impacts and mitigation measures for each work item of Ha Tinh subproject that are not addressed through the general measures in the ECOPs, because the severity or site-specific nature of the impacts and mitigation measures required.

In addition to ECOP, the following type-specific mitigation measures shall be applied:

- **For embankment upgrading, the following mitigation measures shall be applied**

  Avoid dredging in the rainy season, from September to December, in order to maintain drainage function of the river;

  The Contractor shall prepare a Contractor’s Dredging Management Plan (CDMP) and submit to the Supervision Consultant and PMU for review and approval before carrying out the works. The dredging plan shall indicate clearly:

  - The Scope of Works in the Contract package, dredging method and schedule,
  - Water users that may be affected by the dredging and embankment lining
  - the dredging volume, water quality and the characteristics of dredged materials; particularly water should be tested for pH, DO, TSS, BOD, salinity etc.; heavy metals including pH, Hg, As, Cd, Cu, Pb, Zn and Cr, Organic Materials and Mineral Oils must be tested for sediment, one sample of water and one sample of sediment sample must be taken and tested for each contract package
  - Process for temporary storage of dredged materials and plan for pollution control on-site
  - Materials uploading and transportation method to the final disposal site: indicate proposed route of the transport from the dredged site to the disposal area, time of operation, type of vehicles/trucks
  - Schedule to inform the nearby communities about the project, disclosure of name and contact number for possible complaints.
  - Potential social and environmental impacts, including the site-specific impacts and risks of dredging
  - Mitigation measures to address the potential impacts and risks.
  - Final disposal plan;
  - Environmental monitoring plan.

In addition to relevant mitigation measures for common construction impacts, the dredging plan shall meet the following requirements:

  - Coffer dams are built before dredging to separate the construction site from the surrounding waterbodies in order to minimise the potential impacts on river/stream water quality;
  - Disturbance to the ground and on riverbed is kept at minimal; Monitoring is carried out regularly ensure dredged materials at temporary disposal sites would not cause pollution or flooding to the surrounding; sedimentation trap is installed surrounding these temporary disposal
sites;
- Wastewater leaked from dredging materials will be led to flow back into the river;
- When storm is forecasted, dredging or embankment lining activities will be limited, site protection measures are implemented; all construction activities will be halted in stormy weather;

Provide warning signs at dangerous areas, for example, underflows, erosion points, or deep excavation;

Specified safety equipment such as lifebuoys is provided to the workers and force the use when working in the water. Assign observers throughout work shifts for timely rescue in case of emergency;

**For bridge construction, the following mitigation measures shall be applied**

The bridge works shall be scheduled to avoid the high river flow season;

The Contractor shall be required to prepare specific Environmental, Health and Safety Plan (EHSP) before the demolition of the existing bridge and construction of the new bridge. At minimum, the EHSP shall satisfy the following requirements;

- Descriptions on measures for spill prevention, and sedimentation control, surface water flow diversion, reinstatement, etc;
- Local people shall be informed about the block off and demolition of the existing bridge with at least two weeks notice;
- Signboards and fences shall be placed and maintained to safely block off access to the two ends of the existing bridge. Allocate staff to guard the site 24 hours per day. Ensure adequate lighting at night time;
- Signboard directing traffic diversion shall be installed at the two ends of each existing bridges before demolition;
- Life vests and protective equipment are provided to the workers and enforce the use when working in or above water surface, especially during construction of bridge abutments if there is 2-3 m water in the stream;
- The waste shall be controlled strictly to restrict discharge or dumping of any wastewater, slurry, waste, fuels and waste oil into the water. All these materials must be collected and disposed of on land at the banks. The slurry and sediment shall also pump to the banks for disposal and shall not be allowed to discharge to the rivers directly;
- Reinstatement of watercourse crossings;
- After bridge construction, the works area shall be reinstated;
- Concrete mixing directly on the ground shall not be allowed and shall take place on impermeable surfaces;
- All runoff from batching areas shall be strictly controlled, and cement-contaminated water shall be collected, stored and disposed of at the approved site;
- Unused cement bags shall be stored out of the rain where runoff won’t affect it; Used (empty) cement bags shall be collected and stored in
weatherproof containers to prevent windblown cement dust and water contamination;,
- All excess concrete shall be removed from site on completion of concrete works and disposed of. Washing of the excess into the ground is not allowed. All excess aggregate shall also be removed;

Table 23: Site-specific mitigation measures in the construction phase

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<th>Site-specific impacts</th>
<th>Specific mitigation measures</th>
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<th>Supervision</th>
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| Impacts on agricultural production activities of local people: (1) Spillway & Outlet on Phu-Long-Nhuong Dyke; and (2) Khe Tria Outlet | - Inform people about the time of construction so that people have plant to irrigation.  
- Must arranges a suitable schedule,  
- Mustn’t gather construction materials, and limit the excavation and backfilling in the sowing and harvesting period.  
- Must cover material and gather in the suitable place  
- At the construction site of Khe Tria Outlet: Construction of temporary bridge to ensure the smoothly transportation; it should the continuous construction without any extension or delay.  
- Ensure compliance mitigation measures in the ECOP.                                                                                     | Contractor     | PPMU, CSC   |
| Disruption of water supply: spillway and outlet on Phuc-Long-Nhuong dyke             | - Inform people about the time of construction so that people have plant to irrigation.  
- Use coffer dam for mitigating impacts incurred during the construction period on the quality of water sources and remain the water supply through the spillway and outlet.  
- For spillway and outlet on Phuc-Long-Nhuong dyke, the construction of outlet first and spillway later in combination with surrounding dyke to ensure water supply through the outlet and spillway.  
- Must arranges a suitable schedule,  
- Mustn’t gather construction materials, and limit the excavation and backfilling in the sowing and harvesting period.  
- Ensure compliance mitigation measures in the ECOP.                                                                                     | Contractor     | PPMU, CSC   |
| Impacts on water environment and aquatic communities: Spillway & Outlet on Phuc-Long-Nhuong Dyke and Tan Dua bridge, and My Thuan bridge | - Createsedimentation traps and maintain them periodically to ensure that most solids in surface runoff are retained in the traps before entering the existing drains or water sources surrounding the sites;  
- Strictly prohibit contractors to discharge waste into river                                                                                                                                  | Contractor     | PPMU, CSC   |
### Site-specific impacts

**subproject area will be accompanied with pollutants**
- Another factor bound to cause water source pollution is a small amount of domestic waste and wastewater (1.6-2.4 m³/day) from workers’ camps

**Risk of Outlet subsidence during construction process: (1) Outlet on Phu-Long-Nhuong Dyke; and (2) Khe Tria Outlet**

<table>
<thead>
<tr>
<th>Risk of Outlet subsidence during construction process</th>
<th>Specific mitigation measures</th>
<th>Responsibility</th>
<th>Supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Restrict works in the rainy season to reduce risk to water pollution accordingly;</td>
<td>- Ensure heavy equipment and loaded vehicles are parked a safe distance from all river banks;</td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
<tr>
<td>- Ensure the constant presence of supervision consultants and contractors during construction to monitor the potential risk of erosion and landslides and if necessary take the appropriate action</td>
<td>- Establish labor regulations</td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
<tr>
<td>- The river has much bed rock, it is dangerous for workers who may fall into the river during the construction period.</td>
<td>- Ensure that workers will be equipped with labor protection equipment, especially helmet</td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
<tr>
<td>- Provide emergency first aid at the site.</td>
<td>- Install handrail on both side of the bridge</td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
</tbody>
</table>

### Risk of fall into the rock in the river bed: My Thuan bridge

- The river has much bed rock, it is dangerous for workers who may fall into the river during the construction period.

<table>
<thead>
<tr>
<th>Risk of fall into the rock in the river bed: My Thuan bridge</th>
<th>Specific mitigation measures</th>
<th>Responsibility</th>
<th>Supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Establish labor regulations</td>
<td>- Ensure that workers will be equipped with labor protection equipment, especially helmet</td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
<tr>
<td>- Provide emergency first aid at the site.</td>
<td>- Install handrail on both side of the bridge</td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
</tbody>
</table>

### Risk of traffic accidents: Tan Dua and My Thuan bridge

<table>
<thead>
<tr>
<th>Risk of traffic accidents</th>
<th>Specific mitigation measures</th>
<th>Responsibility</th>
<th>Supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Do not transport material and limit the construction activities in rush hours.</td>
<td>- Install warning signs at two access ends of bridge and about 100m away from the construction sites.</td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
<tr>
<td>- Raise awareness of workers and drivers</td>
<td>- Raise awareness of workers and drivers</td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
</tbody>
</table>

### Risk of dyke subsidence and dyke erosion during construction process: 1571,1m of Phuc-Long-Nhuong Dyke in Thien Cam

<table>
<thead>
<tr>
<th>Risk of dyke subsidence and dyke erosion during construction process: 1571,1m of Phuc-Long-Nhuong Dyke in Thien Cam</th>
<th>Specific mitigation measures</th>
<th>Responsibility</th>
<th>Supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Construction in dry season</td>
<td>- Construction in accordance with technical and design requirements of the work</td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
<tr>
<td>- Not using heavy machines with large load on the dyke.</td>
<td>- Frequent inspection for subsidence and erosion</td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
</tbody>
</table>
### Mitigation measures for impacts on sensitive receptors

The construction process will be likely to affect part of these works’ activities, including the people’s safety and access to these places; smoke and dust as nuisance to residents and cultural works that can be affected by the subproject operations are listed in Table 24.

**Table 24: Impact mitigation measures on sensitive receptors at the construction site**

<table>
<thead>
<tr>
<th>Sensitive receptors</th>
<th>Impacts</th>
<th>Specific mitigation measures</th>
<th>Responsibility</th>
<th>Supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duoi church near Phuc-Long-Nhuong Dyke</td>
<td>- Dust, noise generated during the transportation of construction materials and the construction progress, causing impacts on belief of Catholics. - Gathering of crowded workers may cause the conflicts between workers and Catholics.</td>
<td>- Inform local people about construction time  - Do not transport construction materials through the church on Major religious holidays (<em>). - Do not use mechanics which have heavy noise on Major religious holidays (</em>). - Do not construct items that generate a lot of dust and noise on Major religious holidays (*). - Install fences, barriers for dangerous warning/prohibition sites around the construction area which show potential danger to the public. - Increasing watering the road near the Huong Trach church to 4 times/day - Ensure compliance mitigation measures in the ECOP. - Request workers to strictly comply with labor regulations - Recruit local labors</td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
<tr>
<td>Huong Trach church near Tan Dua</td>
<td></td>
<td></td>
<td>Contractor</td>
<td>PPMU, CSC</td>
</tr>
</tbody>
</table>

(*) **Major religious holidays**: Sundays, Christmas day (25/12); the Easter (8/4/2018); Thanksgiving days (23/11/2017 & 22/11/2018); Saint Feast Days (1/11); All Souls Day (2/11); Feast of Our Lady (8/12);
5.2.3. Social impact mitigation measures

❖ Mitigation measures for workers gathering

Mitigation measures for workers gathering during construction phase include:

- The Constructor should prioritize to recruit local workers so as for generating jobs for local people;
- Strengthening the support of the community during the period, saving costs of building camps, reducing disturbances as a result from temporary migration.
- Preparing an active plan on communication, instructing the business households to comply with the regulations which are still satisfactory with local traditions/practices.
- Implementation of community’s health management plan is proposed, including: control negative impacts and risks on the community’s health, actively prevent diseases and epidemics, and efficiently respond to the epidemics.
- To promote the communication and education in regards of risks and potentials of epidemics during the subproject construction for people and local authorities.
- Request workers to strictly comply with labor regulations

❖ Mitigation measures for safety and health of workers and local people

For events/risks that may be generated from the construction period, the Subproject Owner and the Constructor need to make commitments and take measures on monitoring the labor safety commitments. In which:

- The Contractor must comply fully with all Vietnam’s regulations on labor safety;
- Prepare and implement the action plan for responding to risks and emergency situations;
- At each construction site and worker camp, the Contractor must equip full emergency medical services at the site (medical cabinet, necessary medical objects such as bandage, first aid medicine, etc);
- Training workers of occupational safety regulations;
- In cases of using any explosive methods, mitigation measures and safety measures should be incorporated in the environmental management plan;
- Providing workers with full labor protection equipment, especially those operate noise-causing machines, welder workers, etc in order to control noise and protect workers;
- During the demolition of existing infrastructures, workers and people should be protected from fragments by installing chutes;
- Erecting fences, signs of warning surrounding the site to warn people of dangerous risks;
- The Contractor will provide safety methods such as erecting fences, signals of warning, lighting system to prevent traffic accidents as well as other risks on people and sensitive sites.

5.3. Mitigation measures during operation phase

❖ Mitigation for flooding and drainage on all 4 of constructions

- Prepare responding plans in case of flooding at the embankment area as a result of climate change and extreme weather.
- Plug instruction and traffic signs, and f people in traffic safety while circulation.

❖ Falling into rivers, stream and drowning on embankment

- Design and erect fences or barrier gate at the up and down steps to the walking paths under the embankment,
- Plug warning signs and install lighting system in the positions.

**Risks construction damages**
- Regularly check the quality of works, especially during the flood season
- Take measures and reinforce quickly when the structure shows signs of damage.
- Install overloaded sign at two heads of bridges and road on dyke

6. ROLES AND RESPONSIBILITIES FOR ESMP IMPLEMENTATION

6.1. ESMP implementation arrangement

ESMP during construction requires the involvement of several stakeholders and agencies, each with different roles and responsibilities including, PPMU, DONRE (Ha Tinh Department of Natural Resources and Environment), the Contractors, the Construction Supervision Consultant (CSC), and local communities.

To ensure effective implementation of the ESMP, the following actions will be carried out during the implementation of the subproject:

During the detailed design and tender documentation making
- During the detailed design and preparation of bidding /contractual documents for each package, the design consultant will incorporate the mitigation measures and monitoring responsibilities relevant to that bid package into the bidding and contractual documents.
- PMU make effort to inform the bidders/contractors about the subproject safeguard requirements and request them to commit to comply.

![Figure 3: ESMP implementation structure](image)

6.2. Responsibilities of Stakeholder

The roles and responsibilities of the key parties and their relationships regarding the implementation of the ESMP are described as follows:

**Table 25: Environmental protection responsibilities**

<table>
<thead>
<tr>
<th>Community/Agencies</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPMU</td>
<td>PPMU will be responsible for monitoring the overall subproject implementation, including environmental compliance of the subproject. PPMU will have the final responsibility for ESMP implementation and environmental performance of the subproject during the construction and operational phases. Specifically, the PPMU will: (i) closely coordinate with local authorities in the participation of the community during subproject preparation and implementation; (ii) monitor and supervise ESMP implementation including incorporation of ESMP into the detailed technical designs and bidding and contractual documents; (iii) ensure that an environmental management system is set up and functions properly; (iv) be in charge of reporting on ESMP implementation to the DONRE and the World Bank. In order to be effective in the implementation process, PPMU will assign...</td>
</tr>
<tr>
<td>Community/ Agencies</td>
<td>Responsibilities</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Environmental Staff(s) (ES)</td>
<td>The ES is responsible for monitoring the implementation of the subproject ESMP. Specifically, ES will be responsible for: (i) helping PPMU incorporate ESMP into the detailed technical designs and civil works bidding and contractual documents; (ii) helping PPMU incorporate responsibilities for ESMP and supervision into the TORs, bidding and contractual documents for the Construction Supervision Consultant (CSC) and other safeguard consultant (IEMC) as needed; iii) providing relevant inputs to the consultant selection process; (iv) reviewing reports submitted by the CSC and safeguard consultants; (v) conducting periodic site checks; (vi) helping the PPMU on solutions to handle social issues of the subproject; and vii) preparing environmental and social performance section on the progress and review reports to be submitted to the DONRE and the World Bank.</td>
</tr>
<tr>
<td>Construction Supervision Consultant (CSC)</td>
<td>The CSC will assign Environmental and Social Staff(s) and will be responsible for routine supervising and monitoring all construction activities and for ensuring that Contractors comply with the requirements of the contracts and the ECOP. The CSC will engage sufficient number of qualified staffs (e.g. Environmental Engineers) with adequate knowledge on environmental protection and construction subproject management to perform the required duties and to supervise the Contractor’s performance. The CSC will also assist the PPMU in reporting and maintaining close coordination with the local community.</td>
</tr>
<tr>
<td>Contractor</td>
<td>The contractor will assign Environmental and Social Staff(s) to carry out Environmental and Social mitigation measures proposed in ESMP. Based on the approved environmental specifications (ECOP) in the bidding and contractual documents, the Contractor is responsible for establishing a Contractor ESMP (CESMP) for each construction site area, submit the plan to PPMU and CSC for review and approval before commencement of construction. In addition, it is required that the Contractor get all permissions for construction (traffic control and diversion, excavation, labor safety, etc. before civil works) following current regulations. The Contractor is required to appoint a competent individual as the contractor’s on-site Safety and Environment Officer (SEO) who will be responsible for monitoring the contractor’s compliance with health and safety requirements, the CESMP requirements, and the environmental specifications (ECOP). Take actions to mitigate all potential negative impacts in line with the objective described in the CESMP. Actively communicate with local residents and take actions to prevent disturbance during construction. Ensure that all staffs and workers understand the procedure and their tasks in the environmental management program. Report to the PPMU and CSC on any difficulties and their solutions. Report to local authority and PPMU and CSC if environmental accidents occur and coordinate with agencies and keys stakeholders to resolve these issues.</td>
</tr>
<tr>
<td>Local community</td>
<td>Community: According to Vietnamese practice, the community has the right and responsibility to routinely monitor environmental performance during construction to ensure that their rights and safety are adequately protected and that the mitigation measures are effectively implemented by contractors and the PPMU. If unexpected...</td>
</tr>
<tr>
<td>Community/Agencies</td>
<td>Responsibilities</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ha Tinh People’s Committees, DONRE</td>
<td>Oversee implementation of subproject under recommendations of DONRE and PPMU to ensure compliance of Government policy and regulations. DONRE is responsible for monitoring the compliance with the Government environmental requirements.</td>
</tr>
</tbody>
</table>

7. ENVIRONMENTAL COMPLIANCE FRAMEWORK

7.1. Environmental Duties of the Contractor

The contractor firstly shall adhere to minimize the impact that may be result of the subproject construction activities and secondly, apply the mitigation measures under ESMP to prevent harm and nuisances on local communities and environment caused by the impacts in construction and operation phases.

Remedial actions that cannot be effectively carried out during construction should be carried out on completion of the works (and before issuance of the acceptance of completion of works).

The duties of the Contractor include but not limiting to:

- Compliance with relevant legislative requirements governing the environment, public health and safety;
- Work within the scope of contractual requirements and other tender conditions;
- Organize representatives of the construction team to participate in the joint site inspections undertaken by the Environmental Staffs of the CSC;
- Carry out any corrective actions instructed by the Environmental Staffs of the PPMU and CSC;
- In case of non-compliances/discrepancies, carry out investigation and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impact;
- Stop construction activities, which generate adverse impacts upon receiving instructions from the Environmental Staffs of PPMU and CSC. Propose and carry out corrective actions and implement alternative construction method, if required, in order to minimize the environmental impacts; Non-compliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the ES of PPMU and CSC.

7.2. Contractor’s Safety, Social and Environmental Officer (SEO)

The contractor shall be required to appoint competent staff(s) as the Contractor’s on-site safety, Social and environmental officer (SEO). The SEO must be appropriately trained in environmental management and must possess the skills necessary to transfer environmental management knowledge to all personnel involved in the contract. The SEO will be responsible for monitoring the contractor's compliance with the ESMP requirements and the environmental specifications. The duties of the SEO shall include but not be limited to the following:

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

7.3. Environmental and Social Supervision during Construction (CSC)

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

- Review and assess on behalf of the PPMU whether the construction design meets the requirements of the mitigation and management measures of the ESMP,
- Supervise site environmental management system of contractors including their performance, experience and handling of site environmental issues, and provide corrective instructions;
- Review the ESMP implementation by the contractors, verify and confirm environmental supervision procedures, parameters, monitoring locations, equipment and results;
- Report ESMP implementation status to PPMU and prepare the environmental supervision statement during the construction phase;

7.4. Compliance with legal and contractual requirements

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

All the works method statements submitted by the Contractor to the CSC and PPMU for approval to see whether sufficient environmental protection and pollution control measures have been included.

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

The Contractor shall copy relevant documents to the SEO and the ES of CSC and PPMU. The document shall at least include the updated work progress report, the updated work measure, and the application letters for different license/permits under the environmental protection laws, and all the valid license/permit. The SEO and the ES shall also have access, upon request, to the Site Log-Book.
After reviewing the documents, the SEO or the ES shall advise the PPMU and the contractor of any non-compliance with the contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the SEO or the ES concludes that the status on license/permit application and any environmental protection and pollution control preparation works may not comply with the work measure or may result in potential violation of environmental protection and pollution control requirements, they shall advise the Contractor and the PPMU accordingly.

7.5. Environmental claims and penalty system

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

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

7.6. Reporting Arrangements

ESMP monitoring and reporting requirements are summarized in Table 26

<table>
<thead>
<tr>
<th>No.</th>
<th>Report Prepared by</th>
<th>Submitted to</th>
<th>Frequency of Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Contractor to the Employer</td>
<td>PPMU</td>
<td>Once before construction commences and monthly thereafter</td>
</tr>
<tr>
<td>2</td>
<td>Construction Supervision consultant (CSC)</td>
<td>PPMU</td>
<td>Weekly and monthly</td>
</tr>
<tr>
<td>4</td>
<td>Community Monitoring</td>
<td>PPMU</td>
<td>When the community has any complaint about the subproject safeguards implementation</td>
</tr>
<tr>
<td>5</td>
<td>PPMU</td>
<td>DONRE</td>
<td>Every six-month</td>
</tr>
<tr>
<td>6</td>
<td>PPMU</td>
<td>WB</td>
<td>Every six-month</td>
</tr>
</tbody>
</table>

PMBs’ report on environmental performance/compliance of the subproject should be included in the progress report submitted to the NPT before each subproject implementation support mission and must include sufficient information on: i) preparation and disclosures of environmental safeguards instruments for subprojects; ii) incorporation of new subproject ESMPs in the bidding and contractual documents; iii) monitoring and supervision of ESMP implementation by the contractor, the construction supervision engineer, and the PCs; iv) any challenges in safeguard implementation, solutions, and lessons learned.

8. ENVIRONMENTAL MONITORING PROGRAM

8.1. Objectives of the environmental monitoring program

Implementation plan of monitoring program is divided into 2 phases: preparation phase and construction phase. Monitoring program in the preparation phase was shown in the section 3, this section will setup an environmental monitoring program for construction phase. Do not conduct environmental monitoring during subproject operation phase due to mostly positive impacts on this phase. Mitigation measures determined during subproject preparation must be completed by the designer before construction. The proper design results must be included into the contractor's bids.
During construction phase, some mitigation measures must be carried out before construction such as training for contractor and Construction Supervision Consultant. The detailed implementation plan for mitigation measures must be given out to be applied at site on commencement date. Such requirement is also available in the Bidding Documents and such plan shall be inspected by PPMU.

8.2. Review of contractor's documents

ESMP’s Implementation Plan must be prepared by the contractor and inspected by PPMU before the Bids are submitted. All documents submitted by the contractor are appraised in accordance with the subproject requirements and CSE. Any changes in documents must be accepted by the environmental officer and CSE. Such documents must be continuously updated.

8.3. Environmental monitoring criteria

8.3.1. Environmental monitoring plan

During subproject preparation and construction, the environmental monitoring is carried out by the Subproject Owner, concretely:

Table 27: Location, parameters and frequency of monitoring program

<table>
<thead>
<tr>
<th>No</th>
<th>Monitored items</th>
<th>Construction phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Monitoring of air quality, noise, vibration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Monitoring parameters TSP, CO, NO₂, SO₂, Noise (Lₚ₀), vibration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Monitoring frequency Measurements taken every six-months</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Monitoring positions 4 samples/time x 2 times = 8 samples (Sampling locations are presented in Appendix)</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Surface Water Quality Monitoring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Monitoring parameters pH, DO, COD, BOD, N-NH₄⁺, N-NO₂⁻, N-NO₃⁻, P-Po₄³⁻, oil &amp; grease, Coliform, Cl⁻, Fe, TSS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Monitoring frequency Measurements taken every six-months</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Applied Regulation QCVN 08-MT:2015/BTNMT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Monitoring positions 4 samples/time x 2 times = 8 samples (Sampling locations are presented in Appendix)</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Other monitoring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monitoring of solid waste Monitoring volume of waste generated and dredged materials</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monitoring of hazardous waste Monitoring volume at storage location</td>
<td></td>
</tr>
</tbody>
</table>

8.3.2. Social monitoring plan

Social monitoring plan during construction is shown in the Table 28

Table 28: Social monitoring plan during construction

<table>
<thead>
<tr>
<th>No.</th>
<th>Form</th>
<th>Site</th>
<th>Frequency</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OSH monitoring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Environmental hygiene</td>
<td>- Construction site</td>
<td>3 months/time</td>
<td>- Quantity and conditions of cleaning tools</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Worker camping area</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Material mobilization areas</td>
<td>First aid box</td>
<td>Medical works</td>
<td>Number of infectious and contamination cases</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------</td>
<td>---------------</td>
<td>--------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>2</td>
<td>Labor safety</td>
<td>- Construction site</td>
<td>- Worker camping area</td>
<td>- Material mobilization areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 months/ time</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Because construction time is 8-12 months for each work item, the social monitoring will be executed from 3-4 times at each site.

**9. CAPACITY BUILDING PROGRAM**

**9.1. Technical Assistance support for the implementation of safeguards**

An assessment of safeguards implementation capacity of existing PPMU staffs indicate that PPMU staffs have limited knowledge on WB safeguard requirements as well as limited knowledge of environment and social issues. Such lack of capacity represents a risk to subproject implementation of safeguards requirements contained in the ESMP and, as required by the WB policy, is to be addressed through capacity building. Therefore, it is proposed to provide capacity building through technical assistance that will support the PPMU during the implementation of the safeguards requirements. The technical assistance will provide the necessary technical support the PPMU in its work with contractors as well as other entities involved in the implementation of the ESMP.

The scope of the technical assistance would cover support from experts and training that would cover both the knowledge on safeguards requirements and procedures for the subproject as well as training that covers both specific knowledge on safeguard procedures and requirement for the subproject staffs, consultants, and national contractor would be important. This would include, for example, assistance in the preparation of documents and implementation of training program on environmental management and environmental monitoring for contractors, CSC and relevant staffs of PPMU (environmental staffs and coordinators of packages) to do their tasks. It would also include assisting the PPMU’s environmental staffs with the review of contract documents on the bidding packages for construction items of the subproject to ensure compliance with environmental protection policies and impact mitigation and monitoring requirements as well as provide general environmental guidance as requested by the PPMU to enhance overall subproject implementation and performance.

Given the nature, locations, and scale of construction, it is anticipated that the safeguard technical assistance support and training will be provided at least 2 times (one on pre-construction phase and another on construction phase). The WB safeguard specialists will participate in the capacity building in particular in the training activities as appropriate.

**9.2. Training programs proposed**

Table 29 below provides examples of the basic trainings for safeguards during subproject implementation. The training programs will be developed and delivered by the Technical Assistance team for the implementation of safeguards for the PPMU training. The PPMU with the support of the Technical Assistance team for the implementation of safeguards will provide the training to contractors, CSC and other groups.

Other more specific and tailored training will be developed and agreed upon between PPMU and the Technical Assistance team for the implementation of safeguards during subproject
implementation based upon an reassessment of needs and the status of safeguards implementation.

- **Target groups for the training:** include PPMU staffs, ESU staffs, field engineers, CSC, construction contractors, local authorities, and community representatives in the subproject area. Training of workers and drivers is the responsibility of the contractor.

- **Training schedule:** At least 1 month before the construction of the first contract. The training can be adjusted in line with the implementation schedule of the sub subproject/contracts.

- **Training frequency:** The basic training programs proposed in Table 29 will take place every six months on a yearly basis and its content updated and adapted to implementation issues. Training frequency and content will be reassessed during implementation depending on needs. It is foreseen that the training program for PPMU staffs will continue until year three of implementation.

**Table 29: Training programs for capacity building**

<table>
<thead>
<tr>
<th>I. Objects</th>
<th>Provincial Subproject Management Unit (PPMU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training course</td>
<td>Environmental supervision, monitoring and reporting</td>
</tr>
<tr>
<td>Participators</td>
<td>Environmental staffs and technical staffs</td>
</tr>
<tr>
<td>Training Frequency</td>
<td>Soon after subproject effectiveness but at least 1 month before the construction of the first contract. The follow-up training will be scheduled as needed.</td>
</tr>
<tr>
<td>Time</td>
<td>Four days of training twice a year to be repeated on a yearly basis until year three of implementation</td>
</tr>
</tbody>
</table>
| Content | - General environmental management relating to subproject including requirements of WB, DONRE, cooperating with relevant enterprises  
- Requirements on environmental supervision;  
- Supervision and implementation of mitigation measures;  
- Community participation in environmental supervision  
- Guide and supervise contractor, CSC, and community representatives in implementation of environmental supervision.  
- Forms used in environmental supervision;  
- Risk response and control;  
- Other areas to be determined;  
- Receiving approach and submit forms. |
| Responsibilities | PPMU, with support of the Technical Assistance team for the implementation of safeguards |

<table>
<thead>
<tr>
<th>II. Objects</th>
<th>CSC, contractor, commune/wards authorities, community representatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training course</td>
<td>Implementation of mitigation measures</td>
</tr>
<tr>
<td>Participators</td>
<td>CSC; on-site construction management staffs; environmental staffs of contractor; commune/ward/group authorities</td>
</tr>
<tr>
<td>Training frequency</td>
<td>After bidding, update based on requirements</td>
</tr>
<tr>
<td>Time</td>
<td>Three days of training for CSC and contractors and two days of training for other also to be repeated twice a year on an annual basis depending on needs</td>
</tr>
</tbody>
</table>
| Content | - Overview of environmental monitoring;  
- Requirements of environmental monitoring;  
- Role and responsibilities of contractors and CSC  
- Content and methods of environmental monitoring;  
- Response and risk control;  
- Propagate monitoring forms and guide how to fill in the forms and risk report;  
- Other areas to be determined;  
- Preparation and submission of report |
Responsibilities | PPMU with support of the Technical Assistance team for the implementation of safeguards
---|---
**III. Objects** | **Communities and workers**
Training course | Environmental sanitation and safety
Participators | Representatives of community and/or worker leaders (as appropriate)
Training frequency | As appropriate
Time | One-day presentation and one-day on-the-job training twice a year to be repeated on a per needs basis
Content | - Preliminary presentation on environmental protection and environmental overview
- Key issues that require community and workers attention to minimize safety risks (roads, equipment, machines, etc.) as well as reduce pollution (dust, fume gases, oil/grease spill, waste management, etc.)
- Management of environmental safety and sanitation in work sites and worker camps;
- Mitigation measures at construction site and work camps;
- Safety measures on electricity, mechanical, transportation, air pollution;
- Other areas to be determined;
- Procedures to deal with emergency situation
Responsibilities | Contractor, PPMU

10. ESMP COST ESTIMATION

10.1. Cost for mitigation measures by contractor

Expenditure for implementing ESMP includes the main financial resources, covering the environmental monitoring expenses and expenses for implementing the mitigation measures. The expenses of implementing the mitigation measures have been included into the expenditure for implementing construction subprojects on environmental protection works and measures.

10.2. Costs for environmental monitoring program

According to the unit price of environmental monitoring in the locality, the estimated cost for environmental quality monitoring of Ha Tinh subproject is stated in the table below:

<table>
<thead>
<tr>
<th>No</th>
<th>Name of analysis index</th>
<th>Unit</th>
<th>Quantity</th>
<th>Price (VND)</th>
<th>Sub-Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1 USD = 22,700 VND)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VND</td>
<td>VND</td>
</tr>
<tr>
<td>1</td>
<td>Air quality</td>
<td>sample</td>
<td>8</td>
<td>1,200,000</td>
<td>9,600,000</td>
</tr>
<tr>
<td>2</td>
<td>Surface water quality</td>
<td>sample</td>
<td>8</td>
<td>2,500,000</td>
<td>20,000,000</td>
</tr>
<tr>
<td>3</td>
<td>Preparing report</td>
<td>Report</td>
<td>2</td>
<td>8,000,000</td>
<td>16,000,000</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td>126,000,000</td>
<td>2,009</td>
</tr>
</tbody>
</table>

10.3. Cost for training and capacity building

Estimated cost for training program on environmental monitoring management capacity is presented in the following table.


### Table 31: Cost for capacity building training

<table>
<thead>
<tr>
<th>Training content</th>
<th>Trainee</th>
<th>Unit</th>
<th>Quantity</th>
<th>Price</th>
<th>Sub-Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VND</td>
<td>VND</td>
</tr>
<tr>
<td>Environmental monitoring and reporting</td>
<td>PPMU: Staff in charge of environmental issues; environmental managers</td>
<td>course</td>
<td>2</td>
<td>30,000,000</td>
<td>60,000,000</td>
</tr>
<tr>
<td>Implementation of mitigation measures</td>
<td>CSC; construction engineers, site construction field manager, etc</td>
<td>course</td>
<td>2</td>
<td>30,000,000</td>
<td>60,000,000</td>
</tr>
<tr>
<td>Safety and environmental sanitation</td>
<td>Representatives of workers</td>
<td>course</td>
<td>2</td>
<td>20,000,000</td>
<td>40,000,000</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td></td>
<td></td>
<td></td>
<td>160,000,000</td>
<td>320,000,000</td>
</tr>
</tbody>
</table>

### 10.4. Cost for monitoring the ESMP implementation

The following table provides a cost estimate for the implementation of environmental management plan (ESMP). The cost of ESMP implementation will include (i) the costs of implementing mitigation measures by the contractor, (ii) expenses supervised by CSC, (iii) the costs of environmental quality monitoring, (iv) the cost of safety management for the PPMU and (v) costs of environmental capacity building, including both technical assistance in implementing safety policies and training programs. The costs of implementing mitigation measures during construction will be a part of the value of construction contracts, while the costs for a site-specific environmental monitoring plan (SEMP) by the construction supervision consultant (CSC) will be provided in construction supervision contracts. The costs of the PPMU operations relating to ESMP are allocated from the subproject management budget of the PPMU, including safety training programs, and basic allowances to participants in the monitoring programs. After the subproject has been completed, the costs of environmental monitoring of constructed works will be taken from the operation and maintenance budget of the city (as if).

It should be noted that the involvement of the community in the process of ESMP implementation is completely voluntary participation for the benefit of own community and households. Therefore, communities partaking in monitoring the ESMP will not get paid. However, in order to encourage community participation, it is necessary to allocate costs of materials and instruments for monitoring activities and some remuneration for a small number of members chosen by the public to participate in monitoring activities. As stipulated in the Prime Minister’s Decision No. 80/2005/QD-TTg dated 18 April 2005 promulgating the regulations on investment supervision by the community and Joint Circular guiding the implementation of Decision 80/2005/QD-TTg, "expenses for the community’s investment monitoring in the commune/ward in are reflected in the cost estimates of the Communal Fatherland Front Committee’s budget and allocated from the communal/municipal budget; support funds for the dissemination, organization of training courses, guidance, preliminary and final report on investment monitoring by the community at provincial and district levels are balanced in the cost estimates of the Fatherland Front Committee at provincial/district level and allocated from the provincial budget”.

The following table provides the estimated costs for environmental quality monitoring and capacity building for reference purposes. However, final costs will be updated in the detailed design phase.
Table 32: Cost for ESMP implementation

<table>
<thead>
<tr>
<th>Content</th>
<th>Items of Ha Tinh sub-project (thousand USD)</th>
<th>Funded by</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Mitigation during construction</td>
<td>As a part of the contract</td>
<td>WB</td>
</tr>
<tr>
<td>(b) Monitoring safety policies during construction</td>
<td>As a part of the cost for Construction Supervision Consulting (CSC)</td>
<td>WB</td>
</tr>
<tr>
<td>(c) PPMU’s units in charge of environmental safety policies</td>
<td>As part of the costs for the PPMU</td>
<td>Counterpart funds</td>
</tr>
<tr>
<td>(d) Environmental quality monitoring</td>
<td>2,009</td>
<td>WB</td>
</tr>
<tr>
<td>(e) Capacity building programs on safeguard policies</td>
<td>7,048</td>
<td>WB</td>
</tr>
</tbody>
</table>

11. GRIEVANCE REDRESS MECHANISM (GRM)

Complaints relating to any subproject's problems will be solved through negotiations to achieve the consensus. A complaint will go through three Stages before it can be transferred to the court. The enforcement unit will pay all administrative and legal fees relating to the acceptance of complaints. This cost is included in the subproject budget.

Complaint procedures and resolution will be performed as follows:

The first level People’s Committee of ward/commune. An affected household is to take his/her complaint to any member of the People's Committee of the ward/commune, through the ward head or directly to People’s Committee of ward, in written or oral form. The said member(s) of the People's Committee will inform the People’s Committee of the ward on the complaint. The People's Committee of Ward will work directly in person with the said affected household and will decide on the settlement of the complaint 5 days after receiving such complaint. The Secretariat of the People’s Committee of the relevant ward is responsible for documenting and recording all the complaints that it is handling.

After the Ward People's Committee issues its decision, the relevant household can make an appeal within 30 days. In case a second decision has been issued but the said household is still not satisfied with such decision, such household can appeal to the municipal (city) People’s Committee (CPC).

The second level the CPC. Upon receiving a complaint from a household, the CPC will have 15 days after receiving the complaint to resolve the case. The CPC is responsible for filing and storing documents on all complaints that it handles.

When the CPC has issued a decision, the household can make an appeal within 30 days. In case a second decision has been issued and the household is still not satisfied with such a decision, they can appeal to the Hanoi People’s Committee.

The third level The Ha Tinh People’s Committee (PPC). Upon receiving a complaint from the household, the PPC will have 30 days after receiving the complaint to resolve the case. The PPC is responsible for filing and storing documents for all complaints to be submitted.

After the HPC has issued a decision, the household can appeal within 45 days. In case a second decision has been issued and the household is still not satisfied with such decision, they can appeal to the court within 45 days. The HPC will then have to pay the compensation into an account.
The Forth Level Provincial Court. In case a complainant brings his/her case to a provincial court and the court rules in favor of the complainant, the provincial authorities will have to increase the compensation up to such a rate as may be ruled by the court. In case the court’s ruling is in favor of the HPC, the complainant will be refunded the amount of money that has been paid to the court.

The decision ruling the settlement of complaints will have to be sent to complainants and concerned parties, and shall be publicly posted at the headquarters of the People's Committee of the relevant level. The complainant will receive such ruling three days after the result of complaint resolution at the ward/commune/town level has been decided upon and 7 days at the district or provincial level.

Personnel: The environmental staffs chosen by the PPMU will design and maintain a database of the subproject-related complaints from affected households, including information such as: the nature of the complaint, the source and date of receipt of the complaint, the name and address of the complainant, action plan, and current status.

For oral complaints, the receiving/mediator board will record these requests in a complaint form at the first meeting with the affected person. Contractor and Construction Supervision Consultant:

During construction, the GRM will also be managed by the contractors under supervision of the CSC. The contractors will inform the affected communities and communes about the GRM availability to handle complaints and concerns about the subproject. This will be done via the community consultation and information disclosure process under which the contractors will communicate with the affected communities and interested authorities on a regular basis. Meetings will be held at least quarterly, monthly information brochures will be published, announcements will be placed in local media, and notices of upcoming planned activities will be posted, etc.

All complaints and corresponding actions undertaken by the contractors will be recorded in subproject safeguard monitoring reports. Complaints and claims for damages could be lodged as follows:

- Verbally: direct to the CSC and/or the contractors’ safeguard staffs or representatives at the site offices.
- In writing: by hand-delivering or posting a written complaint to specified addresses.
- By telephone, fax, e-mails: to the CSC, the contractors’ safeguard staffs or representatives.

Upon receipt of a complaint, the CSC, the contractors’ safeguard staffs or representatives will register the complaint in a complaint file and maintain a log of events pertaining to it thereafter, until it is resolved. Immediately after receipt, four copies of the complaint will be prepared. The original will be kept in the file, one copy will be used by the contractor’s safeguard staffs, one copy will be forwarded to the CSC, and the fourth copy to the PPMU within 24 hours since receipt of the complaint.

Information to be recorded in the complaint log will consist of:

- The date and time of the complaint.
- The name, address and contact details of the complainant.
- A short description of the complaint.
- Actions taken to address the complaint, including contact persons and findings at each step in the complaint redress process.
- The dates and times when the complainant is contacted during the redress process.
- The final resolution of the complaint.
- The date, time and manner in which the complainant was informed thereof.
- The complainant’s signature when resolution has been obtained.

Minor complaints will be dealt with within one week. Within two weeks (and weekly thereafter), a written reply will be delivered to the complainant (by hand, post, fax, e-mails) indicating the procedures taken and progress to date.

The main objective will be to resolve an issue as quickly as possible by the simplest means, involving as few people as possible, and at the lowest possible level. Only when an issue cannot be resolved at the simplest level and/or within 15 days, will other authorities be involved. Such a situation may arise, for example, when damages are claimed, the to-be-paid amount cannot be resolved, or damage causes are determined.

World Bank Grievance Redress Mechanism: Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported subproject may submit complaints to existing subproject-level grievance redress mechanism or the WB’s Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address subproject-related concerns. Subproject affected communities and individuals may submit their complaints to the WB’s independent Inspection Panel which determines whether harms occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the WB’s attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank’s corporate Grievance Redress Service (GRS), please visit www.worldbank.org/grs. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

12. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

12.1. Objectives of public consultation

The subproject's public consultation required during ESMP was implemented. The community involvement and consultancy meetings were carried out to: Provide the useful information and better understand about the subproject and its potential impacts and improve the subproject as necessary; Allow the controversy issues to appear early; Facilitate to quickly solve the problems; Facilitate to set up the transparent procedures to implement the proposed subproject and create the accountability and awareness on local ownership during subproject performance. The affected groups and local NGOs were notified in accordance with WB’s action policy (OP 4.01) on EIAs or EPPs; the involvement was required during subproject preparation to some extent and regularly recommended as a part of implementation.

12.2. Location, date and participants

In March 2017, PPMU has coordinated with the Consultant to carry out the public consultation in 05 towns/communes in the Subproject area. The consultation is to inform the local authorities and communities of Subproject information and to gather was comments from authorities and local people on the Subproject’s policies, as well as their entitlements to be benefited from the Subproject.
Table 33: Consultation schedule

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Location</th>
<th>Consultation time</th>
<th>No. of Participants</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spillway and Outlet on Phuc-Long-Nhuong Dyke</td>
<td>Thien Cam Town PC³</td>
<td>8h00 – 31/03/2017</td>
<td>15</td>
<td>• Representatives of local authorities and unions:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Farmers’ Association,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Women Union,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Fatherland front committees,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- The Youth Union.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Representatives of AHs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Representatives of households surrounding the project area</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Representatives of PPMU</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Representatives of the consultant</td>
</tr>
<tr>
<td>2</td>
<td>Khe Trìa Outlet</td>
<td>Xuan Vien Communal PC</td>
<td>13h30 – 30/03/2017</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Tan Dua bridge</td>
<td>Huong Trach Communal PC</td>
<td>14h00 – 15/03</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>My Thuan bridge</td>
<td>Ky Son Communal PC</td>
<td>14h00 – 15/03</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

12.3. Method of public consultation

Meeting was held with the aforesaid respondents, including: local authorities, local mass organizations; households to be directly affected by the subproject. The opinions were released after the Subproject Owner presents the report: Overview about the contents and main items of the subproject, financial resources for implementation. The consultant presented the ESMP, including the mitigation measures and implementation plans. The environmental and social impacts and mitigation measures had been consulted.

12.4. Public consultation results and feedback of the subproject owner

Local authorities and people of ward/commune in the subproject area totally agreed with the implementation because it will bring many socio-economic and environmental benefits. However, it was required to ensure environmental sanitation during construction process, particularly prevention from dust, gas, damage of roads and construction needs to be fast to ensure scheduled progress. The results of public consultation in 5 communes/town are showed in Table 34.

Table 34: Specific comments and feedback of subproject owner

<table>
<thead>
<tr>
<th>Comments</th>
<th>Feedback of Subproject Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common comments</td>
<td></td>
</tr>
<tr>
<td>- Local government and people strongly agreed on the subproject and expected the subproject to be implemented soon</td>
<td>- Compensation and support policies will be carried out under the regulations of the GoV and the World Bank. Compensation and support contents must be publicized, transparent and listed at</td>
</tr>
<tr>
<td>- Local people asked PPMU to figure out methods for ensuring the smooth transportation during the construction period.</td>
<td></td>
</tr>
</tbody>
</table>

³ Consultation in Cam Phúc commune and Thien Cam town was taken in Thien Cam town People’s Committee.
- Request to publicize the satisfactory compensation policies for subproject AHs.
- Draw out clear plan to disseminate to the people before subproject implementation.
- PPMU and construction unit should strictly take mitigation measures set forth in the ESMP.
- Because the roads accessing to the subproject were only allow trucks with less than 8 tons, the overload trucks will not be allowed to use by the construction unit. If the construction cause damages on the road, PPMU and the contractor shall be responsible for repairing the road as previous state.
- Once the subproject was implemented, the dykes, bridges will not be used for travelling; it was recommended that the PPMU must take successive construction methods to ensure the travel of local people.
- The contractor must place sign warning that the construction was under progress and install warning signs, etc.

<table>
<thead>
<tr>
<th>Comments from Local people, Cam Phuc CPC and Thien Cam CPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the construction progress, water supply for irrigation must be ensured</td>
</tr>
</tbody>
</table>
| Construction material will not be allowed to transported through Duoi Church on the religious holidays. | - Contractor do not transport construction materials through the church on Major religious holidays(*).  
- Ensure compliance mitigation measures in the ECOP |

<table>
<thead>
<tr>
<th>Comments from Local people, Huong Trach CPC</th>
</tr>
</thead>
</table>
| It should limit the construction material transportation and construction on religious holiday because Huong Trach Church was opposite to the construction site of Tan Dua bridge | - Contractor do not transport construction materials through the church on Major religious holidays(*).  
- Ensure compliance mitigation measures in the ECOP |
| To ensure social safety, to register temporary residence for immigrant workers; to give priority for recruiting labor workers | - Subproject owner commits to give priority to recruit local labors;  
- Subproject owner will request construction contractor to have record of workers and contact with People’s Committee of Duc Thang commune for registration of temporary residence |

<table>
<thead>
<tr>
<th>Comments from Local people, Ky Son CPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subproject implementation should ensure subproject quality, progress and subproject should be implemented soon before flood season;</td>
</tr>
</tbody>
</table>
### Comments from Local people, Khe Tria CPC

<table>
<thead>
<tr>
<th>Action</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPMU must place adequate traffic signs when the subproject was put into operation.</td>
<td>Install signs (overloaded, traffic, warning) at two heads of bridges</td>
</tr>
<tr>
<td>PPMU must carry out the construction of Khe Tria Outlet in the shortest period so that people’s travel will soon be facilitated</td>
<td>- Construction supervision will be performed strictly ensuring quality and progress.</td>
</tr>
<tr>
<td>There should be measures to ensure traffic safety when transport vehicles run through residential were a. Vehicles need to be covered and carry with right load, not affecting the road;</td>
<td>- Subproject owner will request construction contractor to arrange at least 2 personals to regulate traffic flow at peak hours. Signboard and signal lights will be installed at the entrance of construction site.</td>
</tr>
</tbody>
</table>

Some pictures on public consultant meeting in the subproject area:

1. Meeting in Thien Cam town
2. Meeting in Huong Trach commune
3. Meeting in Ky Son commune
4. Meeting in Khe Tria commune

**Figure 4: Consultancy meeting in the subproject**

### 12.5. Information disclosure

The first draft ESMP in Vietnamese had been published at the offices of 5 communes/town and the Ha Tinh PPMU on May 2017 for public consultation. Basing themselves on the contents of the ESMP, the local people could get the Subproject information and contribute their opinions/comments on environmental issues of the Subproject. The final draft ESMP in
Vietnamese language was published at the offices of 5 communes/town and the Ha Tinh PPMU on June 12\textsuperscript{nd}, 2017. The final draft ESMP in English will be disclosed at the World Bank's internal and external websites on June 20\textsuperscript{th}, 2017.
Figure 5: Diagram of sampling locations for environmental monitoring program

Legend
A: Air quality, noise, vibration sample
S: Surface water sample