LAM DONG PROVINCIAL PEOPLE’S COMMITTEE
DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT

VIETNAM DAM REHABILITATION AND SAFETY IMPROVEMENT PROJECT
(DRASIP)

REPORT
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
SUBPROJECT: REPAIR AND UPGRADING OF DA TEH RESERVOIR – MY DUC
COMMUNE – DA TEH DISTRICT – LAMDONGPROVINCE

(Updated)

Lam Dong
August, 2018
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Lam Dong
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EXECUTIVE SUMMARY

1. Background: The “Repair and Upgrading of Da Teh Reservoir” is one of the sub-projects being proposed for funding under the World Bank-assisted Dam Rehabilitation and Safety Improvement Project (DRSIP). An Environmental and Social Impact Assessment (ESIA) was conducted in compliance with the World Bank requirements and the Vietnam's Law of Environmental Protection (LEP). This report provides a summary of the result of the ESIA.

2. The reservoir is located in My Duc commune, Da Teh district, Lam Dong province. It is about 180km and 150km far from Da Lat city and Ho Chi Minh City, respectively. The reservoir has a basin area of 198 km² and a capacity of 29.35 million cubic meters. Its head works complex and auxiliary works include following items:

- Earth dam
- Flood spillway
- Water intake
- Operation house and communication system for management purpose
- Power lines and electricity distribution system; and
- Management road.

3. The facility needs immediate rehabilitation due to lack of regular maintenance work since construction 1995. There are multiple occurrence of landslides on the embankments and water leakages and penetration have occurred at the embankment foundation. During operation, the physical structure has been damaged, degraded and disqualified with the irrigation design capacity, raising highly potential risks for the headworks and threatening the safety of downstream area. Although some damaged sections have been reinforced, the water regulation function, reservoir capacity are no longer met and safety can no longer be guaranteed.

4. Subproject description. The proposed rehabilitation and improvement of the dam and reservoir aims to: (i) assure reservoir safety during operation principally by repairing and retrofitting for extreme weather events; and (ii) meet increasing demand for water in the lowland area by restoring the initial design capacity and stable supply of irrigation water to 2,300 hectares of rice paddy field and other crops whole year round. The proposed works would involve the following:

- Earth Dam: Repair on the dams include rehabilitation and expansion of the downstream section to restore embankment at the desired compaction coefficient; reinforcement of the top of the dam by a 20-cm thick M200 concrete; repair of the upstream and downstream roofs; and fixing of the water seepages and penetration in the dam body and foundation.
- Flood Spillway: Works include expansion and upgrade of the overflow weir, rehabilitation of the chute and flanks with reinforced concrete and rebuilding of the weir bridge, among others.
- Water Intake: Various repair works including clearing and re-lining of the culvert, reinforcement of the external valve tower, repair of the tower building and service bridge, replacement of the steel gate, etc.
- Operation House and Communication System: Construction of head works operation house with 4th grade house standard and gross area of 150m² and installation of automatic reservoir water level observation system to facilitate the works management and operation.
- Power Line: Installation of 1.8 km long LV wire lines from weir shoulder to flood spillway for management and operation purpose.
- Management Road: Reinforcement of the section behind the water intake to flood spillway with specifications of 1.7km length, M200 concrete, 20cm thickness and 3m width.

5. These repair and upgrading works were identified based on the Dam Safety Assessment conducted as part of the preparation of the DRSIP project. The subproject was designed and will be implemented in accordance with the requirements of the World Bank Safety of Dam Policy (OP/BP 4.37) and the national dam safety standards of the Socialist Republic of Vietnam.
6. **Environmental and Social Screening.** The subproject underwent mandatory environmental and social screening to determine any ineligible activities from the safeguards policies point of view and determine the scope of the assessment. The results of the screening indicate that the subproject will not result in increase of the designed water storage capacity of the dam. The local residents in the area are mainly Kinh (92.7%) which is the mainstream group in Vietnam. No ethnic minority households are affected. There are no graves, temples or any structure or sites with cultural, religious or historical significance in the subproject area. The proposed civil works falls under the World Bank Environment Category B while the dam is considered “small” based on the World Bank classification. There are no critical natural habitats or protected areas of natural habitats in the area and there are no species in the rare and endangered lists in the area.

7. **Social and Environmental Impacts:** The subproject will provide benefits to the local communities in the form of stable and reliable water supply and improved safety. However, there are also negative impacts and issues that need to be addressed. There following the impacts and issues considered significant and would need to be mitigated:

8. **Loss of land** - A 1.0 hectare of public land at the dam shoulder currently under the Commune's management will be used as burrow pit for embankment materials. No household will be affected in the land acquisition.

9. **Impacts of construction activities** - The total excavated soil volume is about 80,000m³, which will be sourced within 200 m distance from the site. The backfilling soil volume required for the entire works is about 93,000 m³. Hence all excavated soils will be reused. The spoil consisting of top soil and herbage is estimated at 5,000 m³ shall disposed at the bottom of the downstream slope of the dam. Other materials such as stone and gravel will sourced at various quarry sites 10-70km away. The number of workers estimated at peak hours would be 150 persons while the total number of equipment to be mobilized is around 40.

   - Temporary increase in sedimentation of the waterways during rainy days due to earthmoving activities.
   - Increase in dusts nuisance within the construction sites;
   - Increase in noise levels within the construction site;
   - Increase health and safety risks among local residents near the dam and along construction routes due to exposure to construction-related hazards;
   - Domestic and hazardous waste - The amount of domestic wastes (i.e. wastewater and solid waste based on a peak of 150 workers) will be significant. These would require adoption of a comprehensive housekeeping and waste management system by the contractor. Standard waste containment and treatment measures (i.e. septic tank, soak pit), regular collection and disposal (i.e. solid wastes to the landfill). Hazardous materials will also require imposition of standards industry practice of storage and containment in case of spillage.

10. **Mitigation Measures.** To address these impacts, an Environmental Management Plan (ESMP) has been prepared as part of this ESIA report. The specific measures in the ESMP are as follows:

   - Careful and optimal scheduling of construction activities to coincide with fallow periods, inclose consultation with the affected farmers to minimize cropping disruptions.
   - Imposition of good housekeeping practices at the construction site in terms of storage of materials, disposal of construction spoils to the designated landfill, regular sprinkling of roads in residential areas during dry days. All these to be incorporated in Contractor's own Environmental and Occupational Health and Safety Plan (CEOHSP) together with standard construction EHS practices such as wearing of PPEs, provision of adequate water and sanitation facilities at campsite, waste management including domestic wastewater and hazardous waste, medical screening of workers, installation of fences and warning signs at dangerous areas and good community relations. Compliance with the relevant environmental protection criteria should also be included the plan.
   - Requiring the contractor to undertake site clearing, cleaning and restoration after completion of works, including the leveling of stockpiled surface soils in the burrow pit area and returning the
- Introduction and promotion by MARD of the Integrated Pest Management (IPM) technologies and approaches among the farming communities within the irrigation service areas.
- Constant communication and consultation with the stakeholders during construction to apprise them of the status and progress and also to hear complaints and problems;
- Adoption and setting up of Grievance Redress Mechanism; and,
- Adoption of Chance Find Procedure and Unexploded Ordnance Procedure.

11. Consultation: Consultants and sub-project investors organized 2 community consultations, the first one dated February 03, 2015 at the Cultural House of My Duc commune with 30 participants (Including 22 women) People’s Committee of Da Teh district, People’s Committee and Fatherland Front of communes fully support the implementation of the Project, the affected people in the project area were informed the project profile information and consultation on consensus subproject implementation, determine the scope and influence of the project. The second one dated February 04, 2015 at the Cultural House of Quang Tri commune with 30 participants (Including 6 women) People’s Committee of Da Teh district, People’s Committee and Fatherland Front of communes fully support the implementation of the Project, Consultation is to inform about the negative impact of the sub-project on the environment, society and the mitigation measures. Results: 100% of Participant agreed to implement the project and the mitigation measures by investors. In addition, the affected households recommend to: i) Provide enough water for 2,300 hectares of agricultural land in the process of building the reservoir Da Teh; ii) repair damaged roads if necessary; iii) Assessment of danger for downstream areas in case of emergency flood discharge; iv) Transport, handle the entire construction waste, household waste and construction and aesthetic avoid obstructing traffic. v) Ensure safety during the construction phase; vi) Ensure safety for the workers at construction sites, public health. Investors were receptive and committed to implement all the recommendations in consultation.

12. Resettlement Action Plan: On the basis of the proposed scope of work, no land acquisition (either permanent or temporary) are required. This, no RAP is prepared for this subproject.

13. The Ethnic Minority Development Plan (EMDP): In the project area, there are two main ethnic groups live, they are Kinh Chau Ma, and other ethnic groups such as Tay, Nung. Kinh accounted for most of the project area, with 1,472 households, accounting for 91.2%. Chau Ma live in villages 8, My Duc commune with a total of 134 households, 521 people accounted for 8.3% percentage. Other ethnic groups such as Tay, Nung come from other locations with a total of about 8 households, accounting for 0.05%. Restoring livelihoods for communities; Communication programs; Support clean water to households). With a total cost of 572 million VND proposed (26,600$). The EMDP will be further updated on the basis of the detailed design of the subproject.

14. Risk of dam broken failure: When dam break incidents occur, there would be some consequences: Demolition of buildings, infrastructure, directly affect the lives and property of approximately 1,600 households in town and 2 communes named Da Teh and My Duc, Quang Tri Province, about 10,000 people in a foot dam of downstream 500m - 600m; Cause floods, destroying ecosystems after dams; Cause the lost or lack of water resources for agriculture of around 2,300 ha; damage 10km of roads, 20km of canals; 4 schools; 2 health centers; 2 head office commune People's Committees; Cause affected people to lack water for daily life with a capacity of 10,000 m³ / day of water supply for the town of Da Teh, My Duc, Quang Tri commune.

15. Budget Allocation: Investment capital of sub-project: VND 82,695,623,000 (Eight billion six hundred and ninety five million six hundred and twenty three thousand Vietnam dong) or US$ 3,792,421 (Three million seven hundred ninety two thousand four hundred twenty one US dollars). The cost for the implementation of the ESMP would be VND 1,759,453,000 ((USD 80,565) during the construction phase and VND 500,000,000 (USD 22,900) during operation phase. However, this cost does not include the cost of coffer dam construction and plantation.
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Sub-Project: Rehabilitation and Upgrading of Da Teh Reservoir
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<th>Full Form</th>
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<tbody>
<tr>
<td>BOD</td>
<td>Biological Oxygen Demand</td>
</tr>
<tr>
<td>CPO</td>
<td>Central Project Office under Ministry of Agriculture and Rural Development (MARD)</td>
</tr>
<tr>
<td>CSC</td>
<td>Construction Supervision Consultant</td>
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<tr>
<td>CSEP</td>
<td>Contract for specific Environmental Plan</td>
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<tr>
<td>DARD</td>
<td>Department of Agriculture and Rural Development</td>
</tr>
<tr>
<td>DO</td>
<td>Demand of Oxygen</td>
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<tr>
<td>DONRE</td>
<td>Department of Natural Resources &amp; Environment</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<tr>
<td>ECOP</td>
<td>Environmental Code of Practice</td>
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<tr>
<td>EMDP</td>
<td>Ethnic Minority Development Plan</td>
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<td>EMP</td>
<td>Environmental Management Plan</td>
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<tr>
<td>ESMF</td>
<td>Environmental and Social Management Framework</td>
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<tr>
<td>ESU</td>
<td>Environmental Service Unit</td>
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<tr>
<td>GOV</td>
<td>Vietnamese Government</td>
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<tr>
<td>IMC</td>
<td>Irrigation Management Company</td>
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<tr>
<td>IPM</td>
<td>Integrated Pest Management</td>
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<tr>
<td>MARD</td>
<td>Ministry of Agriculture and Rural Development</td>
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<tr>
<td>OP</td>
<td>Operational Policy of World Bank</td>
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<tr>
<td>PEMC</td>
<td>Provincial Environment Management Consultant</td>
</tr>
<tr>
<td>PMF</td>
<td>Pest Management Framework</td>
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<tr>
<td>PPC</td>
<td>Provincial People’s Council</td>
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<tr>
<td>QCCP</td>
<td>Allowable Code</td>
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<tr>
<td>QCVN</td>
<td>National regulation</td>
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<tr>
<td>RAP</td>
<td>Resettlement Action Plan</td>
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<tr>
<td>REA</td>
<td>Regional Environment Assessment</td>
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<td>RPF</td>
<td>Resettlement Policy Framework</td>
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<td>TCVN</td>
<td>National regulation on environment</td>
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<td>TOR</td>
<td>Terms of Reference</td>
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<td>WB</td>
<td>World Bank</td>
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<td>WUO</td>
<td>Water Users’ Organization</td>
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CHAPTER I: INTRODUCTION

1.1 General information of the project

DRSIP is intended to improve the safety of the dams and related works, as well as the safety of people and socio-economic infrastructure of the downstream communities as defined in Decree 72- governing the management of dam safety in Vietnam. The project will consist of the following components:

- Component 1: Dam safety rehabilitation (US$ 412 million)
- Component 2: Dam safety management and planning (US$ 20 million)
- Component 3: Project management support (US$11 million)

DRSIP will be implemented in 34 provinces in the North, Central and Highland regions of Vietnam. Around 450 dams will be selected for consideration under the project based on agreed selection criteria aimed at prioritizing those interventions that address the safety risks within an explicit poverty and inequality framework. The project will follow a framework approach for environmental and social assessment of the project. However, environmental and social impact assessments (ESIAs) of 12 subprojects selected for first year implementation have been carried out before the Environmental and Social Management Framework (ESMF) prepared. These ESIAs have been prepared based on agreed ToR with the World Bank. This followed the legislative requirement of the government, policy requirement of the World Bank and in line with the Vietnam In-country Technical Guidance Note: Environmental and Social Management Framework Toolkit for World Bank-Financed Projects in Vietnam.

The proposed project will be implemented over a period of six years – from December 15, 2015 to December 30, 2021. The project is required to comply with applicable Vietnamese legislations and the Bank safeguard Policies. The draft Environmental and Social Impact Assessment (ESIA) of the first year subprojects and Environmental Management and Social Framework (ESMF) and will be ready for disclosure prior to Project appraisal.

The Ministry of Agriculture and Rural Development (MARD) will be responsible for overall implementation and management of the project. The PMU to be established within MARD would provide the support to all the three Ministries and responsible for overall coordination and monitoring of the project. The implementation of the rehabilitation works and preparation of dam safety plans, including safeguard and fiduciary, would be decentralized to the provincial level authorities. Provincial project management unit (PPMU) of DARD in each province will response to manage and monitor the sub-project under MARD supervision.

The project will support the physical rehabilitation of the existing irrigation dams most of which were built during the 1980s and 1990s. About 90% of the dams to be rehabilitated are earthen structures and are considered as small dams with height of less than 15m and design volume of less than 3 million cubic meters (MCM). The proposed project is not intended to support significant structural modifications or expansions beyond what is needed to ensure safety. The rehabilitation will be limited to reshaping of the main and auxiliary dams, slope stabilization by either concrete slab or in-situ or stone paving, strengthening or expansion of existing spillways to increase the discharge capacity, refurbishment of existing intake structures, replacement of mechanical and electrical systems of intakes and spillways, grouting for seepage control and improvement of existing roads (access and management roads).

The rehabilitation of the Da Teh irrigation reservoir is the one of the first year sub-projects that will be considered to implement under DRSIP. This ESIA is prepared for the subproject.
1.2 Objectives and methods of environmental and social assessment

1.2.1 Objective
- The objectives of this ESIA is to carry out the environmental and social assessment of this specific sub-project so as the sub-project’s potential social and environmental impacts can be identified at early stage of subproject preparation, the measures to avoid or mitigate the potential negative social and environmental impacts can be proposed for implementation.

- The key contents of this ESIA include assessments on the potential social and environmental impacts of the proposed rehabilitation works on the Da Teh Irrigation Reservoir; an environmental and social management plan (ESMP) which includes environmental monitoring and supervision plan, and reporting mechanisms. Through the ESIA, communication channels have been established to allow local communities to be informed about sub-project proposals and involve the decision making process.

1.2.2 Method

- **Survey and field investigation**: the Consultant team conducted 2 field surveys *(1st phase)* January 28th, 2015 to February 12th, 2015 and *(2nd phase)* on March 06th, 2015 to March 15th, 2015.

- **Sociological survey**: interview 12 households (affected directly and indirectly, benefit) My Duc commune, Da Teh district of Lam Dong province, local leaders in the level of commune/ ward and city.

- **Statistical method**: data collection, processing and analysis: (i) the meteorological, hydrological and environmental data for many years in the project area; (ii) The reports and data on the socio-economic and gender in 3 consecutive years of My Duc commune, Da Teh district of Lam Dong province.

- **Inherited method**: inherit the research results of the relevant projects.

- **Expert method**: consultancy unit participated and organized the meeting, the exposure to take comments on proposed measures to mitigate the negative impacts of the subproject of environmental experts, sociological experts, dam safety experts and gender experts.

- **Analytic and synthetic method**: analyze and synthesize the impact of the project on the components of the natural environment and socio-economic at the operational area of the project.

- **Rapid assessment method**: use the pollution factors of the World Health Organization (WHO) to estimate the amount of waste and pollution forecasting.

- **Comparison method**: the impacts are evaluated by comparison with the norms and standards for the quality of soil, water, noise, air and other relevant environmental standards.

- **Figure model method**: using Figure model to calculate and forecast the average concentration of pollutants in the exhaust gas of material transports to assess the impact of pollutants on the environment.
- **Matrix method:** to compare each activity of the project with each parameter or environmental and social component (air, water, health, economic, etc.) to assess the relationship of cause-consequences of the subproject implementation.

1.3 **Approaches and methods of social assessment**

To ensure all potential impact could be identified during project preparation, the SA was conducted through series of consultations with various project stakeholders. A particular focus was maintained on households who are potentially affected (both positively and adversely). The research techniques employed for this SA include 1) review of secondary data, 2) field observations; 3) focus groups discussions/community meetings, 4) key informant interview, and 5) households survey (Please see Appendix B1 for how the Sampling Frame). A total of 149 of respondents participated in the ESIA exercise for this subproject, of which 123 people participated in the household survey (quantitative), and 29 people participate in focus groups discussions, community meetings and key informant interview (qualitative).

In section 4, 5 we will present the findings of the SA (positive and positive impact), including the result of the gender analysis. In Section 6, we will brefly perform the results of SA along with the recommendations on the basis of the SA results. Please note that a gender action plan and gender monitoring plan are presented at Appendix B4 of this ESIA), and the public health intervention plan and public consultation and communication plan were presented at Appendix B2 and B3, respectively). Complaint settlement process were presented at Appendix B5 and Information announcement and social and monitoring accountability were presented at Appendix B6.

1.4 **Project Owner and Budget**

| Name of the consultant: | VietVuong Construction, Investment and Consulting JSC |
| Represented by: | Phung Duc Cau, M.A; Title: Director |
| Contact address: | No. 9, Duong Thanh, Hoan Kiem, Hanoi. |
| Telephone: | 04.22253288 Fax: 04.22253288 |

Total cost estimation: Investment capital of sub-project: **VND 82,695,623,000** (Eight billion six hundred and ninety five million six hundred and twenty three thousand Vietnam dong) or **US$ 3,792,421** (Three million seven hundred ninety two thousand four hundred twenty one US dollars).

List of main participants during preparing the ESIA Report of the Dam Safety Improvement Project launched in Lam Dong province; sub-project on Da Teh Reservoir as follows:

<table>
<thead>
<tr>
<th>No.</th>
<th>Full anme</th>
<th>Major</th>
<th>Expert</th>
</tr>
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<tr>
<td>1</td>
<td>Nguyen Dang Anh, M.Eng</td>
<td>Hydraulic works</td>
<td>Team leader, experts in hydraulic works</td>
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Sub-Project: Rehabilitation and Upgrading of Da Teh Reservoir
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<th>No.</th>
<th>Full name</th>
<th>Major</th>
<th>Expert</th>
</tr>
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<tbody>
<tr>
<td>2</td>
<td>Dr. Nguyen Viet Hung</td>
<td>Environmental Engineering</td>
<td>Environmental Expert</td>
</tr>
<tr>
<td>3</td>
<td>Ho Thi Huong, M.A</td>
<td>Environmental Science</td>
<td>Environmental Expert</td>
</tr>
<tr>
<td>4</td>
<td>Project Manager Quang Thu Nguyet</td>
<td>Environmental Science</td>
<td>Environmental Expert</td>
</tr>
<tr>
<td>5</td>
<td>Project Manager Tran Quy Long</td>
<td>Sociology</td>
<td>Sociological expert</td>
</tr>
<tr>
<td>6</td>
<td>Project Manager Hoang Thi Hoa</td>
<td>Sociology</td>
<td>Sociological expert</td>
</tr>
<tr>
<td>7</td>
<td>Project Manager Duong Linh Phuong</td>
<td>Economics</td>
<td>Economic expert</td>
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CHAPTER II: SUB-PROJECT DESCRIPTION

2.1 Overview of sub-project

Sub-project on “Rehabilitation and Upgrading of Da Teh Reservoir” will be implemented at My Duc commune, Da Teh district, Lam Dong province, about 200km from Da Lat City. The reservoir has been built since 1995 by the State's budget. During operation, the physical structure has been damaged, degraded and disqualified with the irrigation design capacity, raising highly potential risks for the headworks and threatening the safety of downstream area.

Project owner: Lam Dong Irrigation Investment & Management Center
Address: No. 51 Hung Vuong Street, Da Lat City, Lam Dong Province
Telephone: 063. 3828369
Fax: 063. 3834739

The sub-project is implemented at hamlet 8, My Duc commune, Da Teh district, Lam Dong province as illustrated in below map.

![Location of sub-project areas](image)

The reservoir is a large dam and was built in 1990, the designed water storage of 29.5x10^6 m^3. The catchments areas is of 198 km^2, total water surface of the reservoir is 436ha at normal water level, irrigation with P=85%, the designed flooding peak is Q_{1.5%} = 777.4m^3/s, total annual flow Q_0 = 10.04 m^3/s. The irrigation can supply irrigation water to 2300 ha of agricultural land of Da Teh village. The terrain of irrigation areas is gradually sloping toward the Dong Nai Rivers.

The objectives of the Da Teh sub-project are:
- Recover full irrigation functions of the reservoir for 2300 hectares of agricultural land in My Duc, Quang Tricommune and Da Teh towns improve the strengthen reservoir operational management.
- Enhance safety of the dam and reservoir, protect the residents and the existing infrastructures in downstream.
- Improving the landscape in the areas.

2.2 Proposed scope of work

2.2.1 Earth Dam: Repairing dams include rehabilitation and expansion of dam section towards downstream to ensure designed section by filling soil with compaction coefficient $K \geq 0.97$. Reinforce and extend the dam crest up to 5m in width by concrete M200 with 20cm thickness.

- Upstream slope: Reinforcing the riprap of the upstream slope by stone and concrete
  - From the position of 146m to deeper part: using stone to fill.
  - From position of 146m to 150m (upper part): reinforce with riprap, the material layer thickness of 25cm, and the particle layer thickness of 20cm beneath, builds in concrete cell (5 x5) m.

- Downstream slope: Repair and reinforced downstream slope. Construct drainage channels at the toe of the slope by concrete M150, grass plantation on downstream slope to prevent erosion.

- Using Jet grouting technique to treat water seepage to dam embankment and its foundation with total length is of 318m (at the section of right abutment: 110m in length and at the middle of dam embankment: 208m in length)

2.2.2 Spillway: Proposed work on the spillway:
- Extent principal chute spillway to 24m in width, the elevation of spillway crest is 150.2m, the new spillway has 3 valves layout plane with dimension (8x1.5) m of each; steel gates, opens with electric windlass gate,
- Reinforcing the spillway slope, spillway training wall by using concrete M300
- Extent the receiver canal in upper stream
- Build the bridge across the spillway with 4m in width

2.2.3 Outlet work: Proposed repair and upgrade outlet works

- Reinforce the old outlet work by using concrete M200 with thickness 7cm. Repair the regulate valve at inlet section, install the machine to open the outlet work valves. Repair the power house (outlet works). Reinforce the connected channel with 25m in length by concrete M200

2.2.4 Manager house: build manager house with total areas 150m²

2.2.5 The Access Road: It is 1.7km long, the road is 3m wide, by concrete M200
Quantity and scope of works items are described as follows:

Table 0-1: Scope of works items

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameters</th>
<th>Designation</th>
<th>Unit</th>
<th>Value</th>
<th>Present</th>
<th>After Rehabilitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Design indicators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Basin area</td>
<td>$F_v$</td>
<td>km$^2$</td>
<td>198</td>
<td>198</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Irrigation assurance frequency</td>
<td>$P$</td>
<td>%</td>
<td>75</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Designed flood frequency</td>
<td>$P$</td>
<td>%</td>
<td>0.5</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Check flood frequency</td>
<td>$P$</td>
<td>%</td>
<td>0.5</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reservoir</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Designed flood flow</td>
<td>$Q_{link}$</td>
<td>m$^3$/s</td>
<td>1,143.60</td>
<td>1,143.60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Earth dam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Dam crest elevation</td>
<td>$\n^{dd}$</td>
<td>m</td>
<td>158.0</td>
<td>159.00</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Elevation of breakwater</td>
<td>$\n^{tcs}$</td>
<td>m</td>
<td>159.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Maximum dam height (excluding cutoff dike)</td>
<td>$H_d$</td>
<td>m</td>
<td>27.5</td>
<td>28.00</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Dam length</td>
<td>$L_d$</td>
<td>m</td>
<td>600.00</td>
<td>700.00</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Dam crest width</td>
<td>$B_d$</td>
<td>m</td>
<td>5.00</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Spillway elevation</td>
<td>$\n^{nt}$</td>
<td>m</td>
<td>151.7</td>
<td>151.7</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Elevation of water slope</td>
<td>$\n^{dd}$</td>
<td>m</td>
<td>150.2</td>
<td>150.2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Jet nozzle elevation</td>
<td>$\n^{mp}$</td>
<td>m</td>
<td>146.53</td>
<td>146.53</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Discharge flow rate $Q_{max}$ 0.5</td>
<td>$Q_{max} 0.5%$</td>
<td>m$^3$/s</td>
<td>495.44</td>
<td>595.44</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Discharge flow rate $Q_{max}$ 0.1</td>
<td>$Q_{max} 0.1%$</td>
<td>m$^3$/s</td>
<td>572.97</td>
<td>772.97</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Overflow head corresponding to $p%$ designed</td>
<td>$H_{lk}$</td>
<td>m</td>
<td>6.64</td>
<td>5.35</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Overflow head corresponding to $p%$ designed</td>
<td>$H_{lt}$</td>
<td>m</td>
<td>7.60</td>
<td>6.25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water intake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Culvert length</td>
<td>$L_c$</td>
<td>m</td>
<td>118.5</td>
<td>118.5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Culvert dimensions</td>
<td>(bxh)</td>
<td>m</td>
<td>2x2 and D= 2.000mmm</td>
<td>1.8x1.8 and D= 1.800mmm</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Designed flow rate</td>
<td>$Q_{lt}$</td>
<td>m$^3$/s</td>
<td>5.7</td>
<td>5.7</td>
<td></td>
</tr>
</tbody>
</table>
2.3 Quantity of main materials

Materials are used for the works items such as earth dam, spillway, water intake, access road to dam and spillway and branch line, etc. According to the calculation of design consultant (WHECC), the main material quantity of the works items are shown in the below table:

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Macadam of various types</td>
<td>m³</td>
<td>12,972.83</td>
</tr>
<tr>
<td>2</td>
<td>Ashlars (15 x 20 x 25)</td>
<td>pcs</td>
<td>294,117.00</td>
</tr>
<tr>
<td>3</td>
<td>Quarry-stone</td>
<td>m³</td>
<td>7,562.30</td>
</tr>
<tr>
<td>4</td>
<td>Course sand</td>
<td>m³</td>
<td>12,200.53</td>
</tr>
<tr>
<td>5</td>
<td>Steel wire</td>
<td>kg</td>
<td>6,362.99</td>
</tr>
<tr>
<td>6</td>
<td>Brick of various types</td>
<td>pcs</td>
<td>8,813.00</td>
</tr>
<tr>
<td>7</td>
<td>Wood nog</td>
<td>m³</td>
<td>181.76</td>
</tr>
<tr>
<td>8</td>
<td>Tile of various types</td>
<td>pcs</td>
<td>1,565.00</td>
</tr>
<tr>
<td>9</td>
<td>Bitumen</td>
<td>kg</td>
<td>50,420.68</td>
</tr>
<tr>
<td>10</td>
<td>Roofing iron</td>
<td>m²</td>
<td>150.00</td>
</tr>
<tr>
<td>11</td>
<td>PVC sheets, type KN 92</td>
<td>m³</td>
<td>857.00</td>
</tr>
<tr>
<td>12</td>
<td>Steel shape of various type</td>
<td>ton</td>
<td>57.56</td>
</tr>
<tr>
<td>13</td>
<td>Round bar</td>
<td>ton</td>
<td>341.38</td>
</tr>
<tr>
<td>14</td>
<td>Mortar of various type</td>
<td>m³</td>
<td>195.00</td>
</tr>
<tr>
<td>15</td>
<td>Cement PC40</td>
<td>ton</td>
<td>3,866.00</td>
</tr>
<tr>
<td>16</td>
<td>Plastic pipe</td>
<td>m</td>
<td>2,727.00</td>
</tr>
<tr>
<td>17</td>
<td>Steel pipe</td>
<td>m</td>
<td>88.5</td>
</tr>
</tbody>
</table>

2.4 List of construction plants and equipment

According to the work volume, the design consultant estimates the quantity of main construction equipment as follows:

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Unit</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.7-1.3 ton excavator</td>
<td>pcs</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>10-12 ton dump truck</td>
<td>pcs</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>110CV bulldozer</td>
<td>pcs</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>500l mobile mixer plant</td>
<td>pcs</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>Concrete compactor</td>
<td>pcs</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>250m³/h water pump</td>
<td>pcs</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>10-15 ton tire crane</td>
<td>pcs</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>5m³ oil tanker</td>
<td>pcs</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>5m³ water tanker</td>
<td>pcs</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>50KVA generator</td>
<td>pcs</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>Metal cutter</td>
<td>pcs</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>Metal bending machine</td>
<td>pcs</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>Sawing machine</td>
<td>pcs</td>
<td>1</td>
</tr>
</tbody>
</table>
2.5 Raw materials and supplies for the Project

2.5.1. Backfilling materials

In order to satisfy the reserves and quality on backfilling materials for the works, the Consultant has carried out survey of the borrow pit located at the dam’s right abutment 1ha with capacity of 100,000m³, transportation distance of 200m – 1,000m to the construction site, in which the manual or mechanical exploitation and transportation are favorable. This low hilly side area is managed by the local authority. The compensation for site clearance has been successfully completed since 2009.

2.5.2. Stone

There is no quarry areas around the construction site, therefore the quarry areas from Bao Loc will be used (Quarry areas belong to a firm and it has obtained certificated to exploitoit). It is about 70km far from the works site.

2.5.3. Sand, rubble stone and gravel

Sand, rubble stone and gravel will be exploited at Da Quay River which is about 10km far from the works site.

2.5.4. Others

Other materials are taken from center of Da Teh district about 10km far from the works or transported from Ho Chi Minh City (about 150km).

2.6 Construction progress

Total expected implementation period of sub-project is 24 months; the expected time for completing the remaining parts as well as the site ground return is carried out in the last 3 months. The time to avoid rain and storm lasts about 3 months; therefore the direct construction period is 18 months.
CHAPTER III. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORKS

3.1 Country's Environmental and Social Safeguards Policies and Legislations

This chapter provides the brief of the relevant environmental and social policies of the GoV and the World Bank. Annex-I includes the detailed description and discussion.

3.1.1 Environment

Law on Environmental Protection (No.55/2014/QH13) dated June 23, 2014 and Decree on Environmental Protection Planning, Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Plans (No. 18/2015/ND-CP) dated February 14, 2015 are key legal framework for environmental management in Vietnam. Law on Environmental Protection (LEP) provides statutory provisions on environmental protection activities; measures and resources used for the purpose of environmental protection; rights, powers, duties and obligations of regulatory bodies, agencies, organizations, households and individuals who are tasked with the environmental protection task. LEP is applicable to regulatory bodies, public agencies, organizations, family households and individuals within the territory of the Socialist Republic of Vietnam, including mainland, islands, territorial waters and airspace. LEP is on regulating strategic environmental assessment, environmental impact assessment and environmental protection commitment. According to Article 10, chapter II of LEP, the responsibility for preparing the planning for environmental protection are as following:

1) The Ministry of Natural Resources and Environment shall prepare the national-level planning for environmental protection.

2) People’s Committees of centrally-governed cities and provinces (hereinafter referred to as provincial People’s Committee) shall take charge of formulating processes or preparing the local planning for environmental protection.

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

- The Ministry of Natural Resources and Environment shall consult with Ministries, regulatory agencies and provincial People’s Committees in writing and hold an official consultation with relevant regulatory agencies and organizations during the preparation of the national-level planning for environmental protection.

- Provincial People’s Committees shall consult with departments, regulatory agencies and People’s Committees of a district, town or city (hereinafter referred to as district-level People's Committee) in writing and hold an official consultation with relevant regulatory agencies and organizations during the preparation of the provincial-level planning for environmental protection.

Inspection and approval of the planning for environmental protection shall be required as follows:
The Ministry of Natural Resources and Environment shall establish a Council for interdisciplinary inspection and prepare the national-level planning for environmental protection for submission to the Prime Minister with the intent to seeking the approval for that planning.

Provincial People’s Committee shall inspect and approve the report on the provincial-level planning for environmental protection after obtaining written advice from the Ministry of Natural Resources and Environment.

Ministries, ministerial level agencies and Government bodies shall have the responsibility to establish the council or organize the selection of review service organizations to review environmental impact assessment reports of the projects within their competence of decisions and approvals, except inter-sector and inter-provincial projects.

Provincial level People’s Committees shall have the responsibility to establish the council or organize the selection of review service organizations to review environmental impact assessment reports of the projects that take place within their territories and subject to their competence of decision and approval and that of the People’s Councils of the same level.

Management: Unit for Industrial Parks, Export Processing Zones and Hi-tech Zones: Provincial people’s committee can authorize the Management Unit for Industrial Parks, Export Processing Zones and Hi-tech Zones as regulated in Decree 29/2008/ND-CP dated 14/03/2008 by the Government on industrial parks, export processing zones and economic zones.

The Section 3 of Chapter II of LEP describes the requirements of Environmental Impact Assessment. Owners of projects regulated in Clause 1 Article 18 of this Law shall carry out, on his own, or hire an advisory organization to carry out the environmental impact assessment and take statutory responsibility for the conclusive result after carrying out such assessment. The environment impact assessment must be performed in the preparatory stage of the project. The conclusive result yielded after carrying out the environment impact assessment shall be expressed in the form of the report on environmental impact assessment. Expenses incurred from the formulation and inspection of the report on environmental impact assessment, and included in total investment budget shall be covered by the project owner.

According to Article 21 of LEP, the consultation to be required in the process of environmental impact assessment is aimed at completing the report on environmental impact assessment. It emphasis that consultation helps minimize the negative impacts on the environment and human beings and ensure the sustainable development of the project. Project owners are obliged to consult with regulatory agencies, organizations and communities that are directly affected by the project.

The Article 22 of LEP describes the scope of EIA reporting. It will include: (i) origin of the project, project owners, and the competent authority's approval of the project, method of the environmental impact assessment; (ii) evaluation of technological choice, work items and any activity relating to the project which can cause bad effects on the environment; (iii) assessment of current status of natural and socio-economic environment carried out at areas where the project is located, adjacent areas and demonstration of the suitability of the selected project site; (iv) assessment and forecast of waste sources, and the impact of the project on the environment and community health; (v) assessment, forecast and determination of measures for managing the risks of the project posed to the environment and community health; (vi) waste disposal measures; (vii) measures for minimizing the impact of the project on the environment and community health; (viii) consultation result; (ix) environmental management and supervision
programs; (x) budget estimate for the construction of environmental protection facilities and measures to be taken to minimize the environmental impact; and (xi) alternatives to the application of measures for the environment protection.

The Article 23 of LEP defines the authority to verify the report on EIA. The Ministry of Natural Resources and Environment shall arrange to verify the report on environmental impact assessment in respect of the following projects: (a) Projects subject to the decision on investment intentions made by the National Assembly, Government and the Prime Minister; (b) Interdisciplinary or inter-provincial projects stipulated at Points b and c Clause 1 Article 18 in this Law, exclusive of those classified as the secret projects in the field of national defence and security; and (c) Projects verified by the Government’s authorized entities. The Ministries and quasi-ministerial agencies shall inspect the report on environmental impact assessment in respect of projects that shall be permitted under their decision and approval, but are not specified in regulations mentioned at Points b and c Clause 1 of this Article. The Ministry of National Defence and the Ministry of Public Security shall arrange to verify the report on environmental impact assessment in respect of projects that shall be permitted under their decision and approval, and those classified as the secret projects in the field of national defence and security. Provincial People’s Committees shall arrange to verify the report on environmental impact assessment in respect of investment projects within their territories that are not regulated at Clause 1, 2 and 3 of this Article.

The Article 26 of LEP describes the responsibility assumed by the project owner after being granted the approval of their report on the environmental impact assessment. These include – Clause 1: comply with the requests specified in the approval of their report on environmental impact assessment. Clause 2: where any change in the project size, capacity and technology applied in the project execution is blamed for the negative impact on the environment in comparison with the alternatives given in the approved report on environmental impact assessment, but is not too serious to make another report as stipulated at Point c Clause 1 Article 20 pf this Law, the project owner must send their explanation to the agency who grants the approval of the report on environmental impact assessment, and the project shall be commenced only after obtaining the permission from such agency.

The Article 27 of LEP explains the responsibility assumed by the project owner before bringing the project into operation. These include - Clause 1: apply measures for the environmental protection under the decision on the approval of their report on environmental impact assessment; and Clause 2: notify the agency who grants the approval of the report on environmental impact assessment of the developmental process of environmental protection works functioning as an ancillary part of major projects that can cause bad impacts on the environment in accordance with the Governmental regulations. These projects will be commenced only after the agency in charge of the approval of the report on environmental impact assessment has inspected and certified the completion of environmental protection works.

The Article 28 of LEP mentions the responsibility of the agency in charge of approving the report on the environmental impact assessment. These include – Clause 1: Bear the statutory responsibility for their conclusive result and decision on the approval of the report on environmental impact assessment. Clause 2: Within a period of 15 days as from the date on which the project owner’s report on the completion of environmental protection works under the regulations specified in Clause 2 Article 27 of this Law, the agency in charge of approving the report on environmental impact assessment must examine and issue the certificate of completion of environmental protection works. Where an analysis of complicated
environmental criteria is required, the time span for the issuance of the certificate of completion of environmental protection works can be extended for less than 30 days.

The Article 13 of the Decree (No. 18/2015/ND-CP) explains the requirement of the pertaining EIA agencies. Clause 1: the project owner or the advisory organization conducting EIA must meet all requirements – (a) there are staff members in charge of EIA meeting requirements prescribed in Clause 2 of this Article; (b) there is specialist staff members related to the project obtaining at least Bachelor’s degrees; and (c) there are laboratories, inspection and calibration devices eligible for performing measurement, sampling, processing and analysis of environmental samples serving the EIA of the project; if there is not any laboratory with decent equipment for inspection and calibration, it is required to have a contract with a unit capable of carrying out inspection and calibration. Clause 2: the staff members in charge of EIA must obtain at least Bachelor’s degrees and Certificate in EIA consultancy and Clause 3: the Ministry of Natural Resources and Environment shall manage the training and issuance of Certificates in consultancy of EIA.

In addition, the following Articles are important in the context for EIA approval and reporting.

- Article 14: the authorities for different scales of EIA report approval with deadlines
- Article 15: re-compilation of EIA reports
- Article 16: responsibility of project owners pertaining to the approved EIA reports
- Article 17: inspection and confirmation of environmental protection works serving the operation phase of the projects
- Article 21: Reporting.

3.1.2 Dam safety regulations

Decree no.72/ND-CP on date 07/05/2007 of the government of Vietnam regarding on dam safety management. According to the decree, a big dam is the dam with the height calculating from the floor face to the top of the dam equal to or greater than 15 meters or dam of water reservoirs with the scale of capacity equal to or greater than 3,000,000 m$^3$ (three million cubic meters). Small dam is the dam with the height calculating from the floor face to the top of the dam smaller than 15 meters. Dam owners are organizations and individuals owning dams to harness the benefits of water reservoirs or assigned to manage, operate and harness water reservoirs by the competent state agencies. Ministry of Agriculture and Rural Development takes responsibility before the Government for the implementation of state management of dam safety. The Ministry of Industry presides over and coordinates with ministries, branches and relative localities to appraise, approve or submit to the Prime Minister for approval of the process of operating hydropower reservoirs. The provincial-level People's Committees implement its state management on dam safety in the areas.

In chapter 4 of Decree no.18/2015/ND-CP on date 14/02/2015, from the article 12 to article 17 were specified in the formulation, evaluation and approval of environmental impact assessment reports, the implementation of projects and the designed mitigation measures to protect environment before and after a project officially operation. In the article 12 of this Decree also regards on environmental impact assessment process to the project implementation, the project owner have to organize meetings to public consultants, such as Provincial People's Committees, local authority (Commune People's Committees level- CPC), affected (direct or indirect) people or committees in the local by the project implementation, mandatory; analysis the feedbacks, comments obtained from the affected groups, and consider advantage or disadvantage the impacts of the project to community and to design the mitigation measures to reduce the negative impacts on natural environment, biodiversity, community. According to the
annex no.2 of the Decree, the project has to make EIA if the reservoir capacity is of 100,000m$^3$ or more. According to the regulations of Vietnam Government, the all proposed subprojects under DRSIP project have to perform the report of Environment Impact Assessment (ESIA).

3.1.3 Land acquisition

The GOV’s Legal Framework: The legal framework with respect to land acquisition, compensation and resettlement is based on the Constitution of the Socialist Republic of Vietnam (2013), and the Land Law 2013 (revised), and other relevant decrees/guidelines. The principal legal documents applied for this RPF include the followings:

- Constitution of Vietnam 2013
- The Land Law 45/2013/QH13 which has been effective since July 1, 2014
- Decree No.43/2014/ND-CP dated on May 15, 2014 guiding in detail some articles of Land Law 2013
- Decree No.44/2014/ND-CP dated on May 15, 2014 provides on method to determine land price; make adjusted land price brackets, land price board; valuate specific land price and land price consultancy activities
- Decree No. 47/2014/ND-CP dated on May 15, 2014 providing compensation, assistance, resettlement when land is recovered by the State
- Decree No. 38/2013/ND-CP dated on April 23, 2013, on management and use of official development assistance (ODA) and concessional loans of WB
- Decree No. 201/2013 / ND-CP dated on November, 27, 2013 of the Government detailing the implementation of some articles of the Law on Water Resources
- Circular No. 36/2014 / TT-BTNMT dated on 30 June 2014, regulating method of valuation of land; construction, land price adjustment; specific land valuation and land valuation advisory
- Circular No. 37/2014/TT-BTNMT dated on 30 June 2014, regulating compensation, assistance and resettlement when the State acquires land
- Decision No. 1956/2009/QD-TTg, dated on November 17, 2009, by the Prime Minister approving the Master Plan on vocational training for rural labors by 2020
- Decision No. 52/2012/QD-TTg, dated on November 16, 2012, on the assistance policies on employment and vocational training to farmers whose agricultural land has been recovered by the State
- Others.

Other laws, decrees and regulations relevant to land management, land acquisition and resettlement include the Construction Law 50/2014/QH13, dated on 18 Jun 2014, on construction activities, rights and obligations of organization and individual investing in civil works construction and construction activities; Decree 102/2014 / ND-CP on sanctioning of administrative violations in the field of land replaced by Decree No. 15/2013 / ND-CP dated on February, 06, 2013 on quality management of constructions; Decree No. 12/2009/ND-CP of the Government, dated 12 February 2009 on the management of construction investment projects and replacing the Decree 16/2005/ND-CP, the Decree 38/2013/ND-CP of the Government on the management and use of Official Development Assistance (ODA) fund, and Decree 126/2014/ND-CP of the Government on marriage and family Law implementation, stipulating that all documents registering family assets and land use rights must be in the names of both husband and wife; Decisions of project provinces relating to compensation, assistance and resettlement in provincial territory will be also applied for each relevant project province.
3.1.4 Indigenous/Ethnic minority people

Viet Nam has a large number of policies and programs specifically designed to assist ethnic minorities’ development. The Government of Viet Nam (GOV) has paid much attention to the welfare of ethnic minority groups. There is a ministerial-level government body, the Committee for Ethnic Minority and Mountainous Area Affairs (CEMA), which is in charge of management functions for ethnic minorities and mountainous areas. A country profile of Viet Nam published by the International Work Group for Indigenous Affairs (IWGIA) reports that:

“Indigenous peoples are full citizens of the Vietnamese state and enjoy constitutionally guaranteed rights to their languages and cultural traditions...On the legislative level, the “Council on Ethnic Minorities” has the mandate to advise the National Assembly on ethnic minority issues and to supervise and control the implementation of the government’s ethnic minority policies and development programs in ethnic minority areas.”

The document also reports that since the 1960s, a number of policies and programs have been designed specifically for ethnic minorities, but these are mainly aimed at integrating them into mainstream society rather than enabling them to strengthen their own institutions. Regarding land issues, it reports that “it is important to highlight that the present legislation in Viet Nam allows for obtaining use right certificates for land and forest and that in 2004 the National Assembly passed a new land law which, most relevant for indigenous peoples, now includes the category of “communal land”. By introducing the concept of communal land, the new law provides for the possibility of communities to apply for certificates over communal land.

3.2 Implications of National Policies and Regulations on the Proposed Project

Based on the analysis of the national legal framework, the project will have to fulfil the following minimum requirement and process:

- PPMU or the consulting firm conducting EIA must have staff members in charge of EIA must obtain at least Bachelor’s degrees and Certificate in EIA consultancy. They will also have or arrange adequate laboratory facility for performing measurement, sampling, processing and analysis of environmental samples serving the EIA (Ref. Article 13 of Decree).

- Considering the nature of the subproject, the Provincial People’s Committee (PPC) shall assess and approve EIA reports (Ref. Article 14 of Decree). PPC shall arrange to verify the report on environmental impact assessment in respect of investment projects within their territories (Ref. Article 23 of LEP).

- The assessment of EIA report shall be conducted by the EIA report assessment council established by the Heads of the EIA report assessment authority with at least 07 members. Members of EIA report assessment council shall consist of 01 President, 01 Vice President where necessary, 01 Secretary member, 02 Opponent members and other members, which at least 30 percent of the Assessment council members having at least 06 years’ experience in the EIA field (Ref. Article 14 of Decree).

- Deadlines for assessment of EIA report is within 30 working days from the date on which the satisfactory application is received (Ref. Article 14 of Decree).
PPMU will have to comply requests specified in the approval of their report on EIA. For any change, the project owner must send their explanation to PPC (Ref. Article 26 of LEP).

PPMU will have to notify PPC and the rehabilitated dam will be commenced only after the agency in charge of the approval of the report on environmental impact assessment has inspected and certified the completion of environmental protection works (Ref. Article 27 of LEP).

PPMU will prepare a completion report for environmental protection work and within 15 days of receiving the report, PPC must examine and issue the certificate of completion of environmental work (Ref. Article 28 of LEP).

The inspection of environment protection works serving the operation phase of the subproject shall be carried out by an Inspectorate which is established by the Head of PPC (Ref. Article 17 of Decree).

The PPC shall send a report on assessment and approval for EIA report, registration and inspection of specific environment protection plans, inspection and approval for environment protection works in the province of the previous year to the Ministry of Natural Resources and Environment before every January 15 (Ref. Article 21 of Decree).

MARD shall send reports on assessment and approval for EIA report, inspection and approval for environment protection works of the previous year related to project under their management to the Ministry of Natural Resources and Environment before every January 15 (Ref. Article 21 of Decree).

3.3 World Bank Safeguard Policies

The objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process. Safeguard policies provide a platform for the participation of stakeholders in project design, and act as an important instrument for building ownership among local populations.

The effectiveness and development impact of projects and programs supported by the Bank has substantially increased as a result of attention to these policies. The World Bank Safeguard policies are available in its website: http://web.worldbank.org/WEBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFEPOL/0,,menuPK:584441~pagePK:64168427~piPK:64168435~theSitePK:584435,00.html.

3.4 Implications of World Bank Safeguard Policies on the Proposed Project

Eight World Bank policies have been triggered for the main project. These are: Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Pest Management (OP/BP 4.09), Physical Cultural Resources (OP/BP 4.11), Indigenous Peoples (OP/BP 4.10), Involuntary Resettlement (OP/BP 4.12), Safety of Dams (OP/BP 4.37) and Projects on International Waterways (OP/BP 7.50).

According to WB Operational Policy (OP 4.01), the nature of environmental assessment to be carried out for a particular sub-project would largely depend on the category of the sub-project. As mentioned earlier, The World Bank Operational Policy (OP) 4.01 classifies projects into
three major categories (category A, B and C), depending on the type, location, sensitivity and scale of the project, and nature and magnitude of potential impacts. Considering the environmental risk and complexity related to a large number of subprojects to be implemented in a widespread area, the project has been classified as category ‘A’. However, the subprojects to be funded under the projects can be categorized as ‘A’ or ‘B’ or ‘C’ depending on the extent, scope and impact of the specific subproject.

The project physical activities would only work on existing dams and are not expected to lead to conversion or degradation of critical or semi-critical natural habitats. However, it is required to scope, screen and assess potential impacts to natural habitants as part of the subproject ESIA. The project will not finance any procurement of fertilizers and pesticides. However, since the dam rehabilitation work will increase the agriculture command areas, there are chances of more uses of fertilizers and pesticides in the project influence areas. The project will promote the application of Integrated Pest Management (IPM) and guidance will be included in ESMF.

Since the exact subproject locations are unknown at this stage, there is possibility that some rehabilitation work and access road may pass through areas with physical cultural resources. The impacts will be examined as part of the environmental screening/assessment of different subprojects. In addition, ‘Chance find’ procedures conforming to local legislation on heritage would be evaluated so that any physical or cultural resources are not impacted.

The project may intervene in areas where indigenous people live (specific subproject locations will be determined during implementation). In addition, the project may require land acquisition and resettlement. As such, an Ethnic Minority Policy Framework (EMPF) and Resettlement Policy Framework (RPF) are required for the project and will be prepared separately.

The project will not finance construction of any new dams or significant change in dam structure. This policy is triggered as the project will finance rehabilitation and improvement of existing dams including large dams (15 meters or more in height). Thus, it requires to arrange for one or more independent dam specialists to (a) inspect and evaluate the safety status of the existing dam, its appurtenances, and its performance history; (b) review and evaluate the owner's procedures for operations and maintenance; and (c) provide written report of findings and recommendations for any remedial work or safety-related measures necessary to upgrade the existing dam to an acceptable standard of safety. Policy and practice relating to dam safety needs to meet international benchmarks, such as those are laid out by ICOLD and the World Bank regulatory frameworks for dam safety. These measures are designed into the project, which includes the establishment of a national dam safety review panel (DSRP). Also the project will establish an independent Panel of dam safety Experts (PoE) who will carry out independent review of dam safety reports and proposed mitigation measures. This PoE will be working closely with the to-be-established DSRP to ensure the technical integrity of investment interventions. Each subproject will have separate Dam Safety Plan (DSP) in addition to the ESMP.

The WBG guidelines provide guidance on certain EHS issues, which include standards for environmental parameters (ambient air quality, water and wastewater quality, noise level, waste management), hazard and accident prevention, occupational and community health and safety (during commissioning and decommissioning works) etc. These guidelines will be directly applicable to the proposed project. As a general rule, the WBG guidelines should complement the existing Vietnam guidelines or standards. In case the Vietnam guidelines or standards differ from the WBG guidelines, project is expected to follow the more stringent ones.
The World Bank access to information policy would be directly followed. The project will make the environmental/social assessment and ESMF documents available to the public by publishing it in their websites. In addition, hard copies of these documents in English (including Vietnamese language) will be made available in the PMU and all PPMUs.
CHAPTER IV: ENVIRONMENT AND SOSIO-ECONOMIC CHARACTERISTIC OF THE PROJECT AREA

4.1. Physical conditions
4.1.1 Natural conditions

The catchment areas of Da Teh reservoir is approximately 198 km², a part of the catchment is mountain topography with its elevation of 500m, and this is also the starting point of Dong Nai river. The areas is covered by secondary forest. Downstream of the reservoirs is the irrigated area which is 2300 ha of arable land of My Duc, Quang Tri and Da Teh towns.

![Figure 4.1. Location of Da Teh reservoir and its influenced areas](image)

**Climate condition:** Da Teh Reservoir basin is located in the central areas of Vietnam. It has a tropical monsoon climate which can be divided into two distinct seasons. The dry season starts from October to April last year. During this period, highest rainfall occurs in May, caused flooding “grain full”. The wet season (rainy season) starts from September to December in the same year. The rainfall in the period covers 80%-85% of total annual rainfall. Also, from August to September the areas has receive intensive rainfall and caused a high flood risk. The rainfall in Da Teh areas has an average of 2800mm (intensive rainfall recorded in 2001).

**Temperature:** Average temperature in the areas is 21°C. Warmest month (30-35°C) is in August. The lowest temperature 4-5°C is in December and January (source:Binh Lam Dong, 2015). In general, the area represents an average high temperature range and the constantly gradient change.

**Humidity:** The average humidity in the areas is 85-86%, relative humidity varies significantly with an average of 90% in the wet season period. In addition, in summer time, the air humid value is approximately 80% due to the Foehn wind influenced.

**Table 4.1. Climate conditions in the areas- Da Teh meteor station (5years statistic)**
### Monthly Weather Data

<table>
<thead>
<tr>
<th>Month</th>
<th>Temperature (°C)</th>
<th>Humid (%)</th>
<th>Rainfall (mm)</th>
<th>Wind speed (m/s)</th>
<th>Evaporation (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>14.3</td>
<td>80</td>
<td>37.3</td>
<td>2.2</td>
<td>73.6</td>
</tr>
<tr>
<td>February</td>
<td>15.6</td>
<td>78</td>
<td>35.8</td>
<td>1.8</td>
<td>75.1</td>
</tr>
<tr>
<td>March</td>
<td>18.9</td>
<td>78</td>
<td>94.3</td>
<td>1.6</td>
<td>92.8</td>
</tr>
<tr>
<td>April</td>
<td>22.7</td>
<td>83</td>
<td>84.6</td>
<td>1.2</td>
<td>65</td>
</tr>
<tr>
<td>May</td>
<td>24.1</td>
<td>87</td>
<td>225.7</td>
<td>1.3</td>
<td>50.4</td>
</tr>
<tr>
<td>June</td>
<td>28.2</td>
<td>90</td>
<td>296.4</td>
<td>2.3</td>
<td>37.3</td>
</tr>
<tr>
<td>July</td>
<td>28.5</td>
<td>90</td>
<td>307.5</td>
<td>2.9</td>
<td>39.3</td>
</tr>
<tr>
<td>August</td>
<td>32.3</td>
<td>91</td>
<td>385</td>
<td>2.8</td>
<td>37.5</td>
</tr>
<tr>
<td>September</td>
<td>33.4</td>
<td>90</td>
<td>322.2</td>
<td>1.8</td>
<td>34.7</td>
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<tr>
<td>October</td>
<td>28.5</td>
<td>89</td>
<td>330.9</td>
<td>2.0</td>
<td>37</td>
</tr>
<tr>
<td>November</td>
<td>24.3</td>
<td>86</td>
<td>188.4</td>
<td>3.6</td>
<td>41.4</td>
</tr>
<tr>
<td>December</td>
<td>14.5</td>
<td>84</td>
<td>66.9</td>
<td>3.9</td>
<td>56.9</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>21</strong></td>
<td><strong>86</strong></td>
<td><strong>2475</strong></td>
<td><strong>2.3</strong></td>
<td><strong>641</strong></td>
</tr>
</tbody>
</table>

### Hydrological Regimes:

Water resource of Da Teh reservoir is unregulatedly fed by natural waterways of Da Teh streams. The annual average flows of to the reservoir is 10.04 (m³/s) or 267.88 x 10⁶m³ per year.

Annual peak flood discharge to Da Teh reservoir is, mainly occur in Setember to December, the designed flood peak discharge is Q = 777.4 m³/s. Annual water discharge depends on total water coming into the reservoir, with frequency of P=1%, total water flowing into reservoir in case of flood is M = 267.88 * 10⁶m³. This amount of water is the main reason of increasing water level in the reservoir up to 159m, but this is in safe condition, because the designed high flood level of reservoir is 158.1m, hence no emergency water releasing needed (spillway will operate in case of water level exceeded 150.2m).

In case of discharging flood water out of Da Teh reservoir, the flow goes freely to the spillway via the spillway channel which is connected to the Dong Nai River.

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**Figure 4.2. The buiseness bridge and spillway of the reservoir**
The flow of Da Teh streams is occur only during the rainy season. In many years of operations of the Da Teh reservoir, there is no record or evidence that Da Teh stream have been overflown as the result of flood water discharge from the Da Teh reservoir. On the other hand, along to the Da Teh stream there is no resident areas, so that releasing of floodwater have no impact to local people or infrastructures in downstream areas.

![Figure 4.3. Land scape around the reservoir](image)

**Flora:** The vicinity of Da Teh reservoir has some broadleaf trees such as com tree, bodkin, oak, and chestnut etc. In the agricultural sector, there are some natural plants and recovered plants after cultivation, such as oak, chestnut with low quality, many vines and encroached bush.

**Fonna:** Terrestrial flora and fauna in the project area primarily consist of cattle, pigs, chickens and some species of wild fauna and flora, such as squirrels, rabbits, birds, deer, wild boar, badger, mink, leaning etc. Some kinds of bird (such as shrike, starling, cuckoo, woodpeckers) and a small quantity of reptiles are inhabited in the area of upstream are also available in the area.

According to a survey in February 2015 of environmental consultancy, there are no rare animals in the Red list in need of protection inhabiting in the forests of My Duc and Quang Tri commune. There are also no ecological parks or protective areas which should be protected in the project area.

**Geological characteristics**

Da Teh dam is a homogeneous earth dam with side slopes are covered with sticky soil. Although there is no reliable data available on the minimum water level, the reservoir maintains a certain level of water throughout the year.

Based on the results of geological survey in 1993 together with the investment report by the Company of Highlands Construction Consulting and Irrigation Limited in 2009, the geological characteristics of the area are as follows:

- Layer A: Mixed rock on the dam surface, the average thickness of 0.4 m;
- Layer 1A: Clay, clay mixed with crushed with the colors of gray, yellow, white brown and gray brown, medium structure in hard plastic state with the average thickness of 0.7 ÷ 1.6 m;
- Layer 1: clay, mixed clay with yellow brown, pink colour, medium structure in hard and soft plastic state with the average thickness of 12 ÷ 14 m;
- Layer 2: Clay in yellow brown and pink brown color in medium soft plastic state with the average thickness of 12 m, distributing in the left body of the dam;
- Layer 2A: mixed sand and laterization gravel, yellow-brown with the average thickness of 3 m, distributing in the right body of the dam;
- Layer 3: clay, loam with grit with the colors of pink-brown, tan, gray-yellow, gray and white, tightly structure, hard plastic state, semi-hard, the average thickness of 1 - 25 m;
- Layer 4: Basalt gray with the colors of yellow, black and gray.

**Hydrogeological conditions**

In accordance with investment report, groundwater in the district is under two major complexes:

- Aquifer complex that is porous with Holocene sediments, including: Pebbles, calculus, siltstone, and peat, water layer thickness of 1-25 m, the volumetric flow of water can be extracted from aquifers is from 0.01 to 6.89 l/s.

- Aquifer complex with fractures of terrigenous sediments, late Jurassic and Cretaceous, volcanic late composite components include: Stone Daxit, Riolitupstairs, sandstone and siltstone downstairs. The weathered surface is sandy loam with 0.5 to 5 m of thickness, the thickness of all complex is about 450 metre, the volumetric flow of water can be extracted from aquifers is from 0.06 to 0.64 l/s.

**The quality of groundwater in the project area is as follows:**

- Shallow groundwater (wells): Shallow groundwater levels vary by region and by season. Central area of Da Teh district is regulated by Da Teh Lake. In the rainy season, the water level is within 1-2 m, but in the dry season the water level drops to 5-6 m.

- Groundwater in deep level (wells with depths > 20 m): In depth of above 20 metres, hardness and alkalinity of underground water are quite high (totality hardness of 1,950 mg CaCO₃/litre, totality alkalinity of 1,325 mg CaCO₃/litre, acidic environment of 0.8 mg oxygen/litre). Thus, if the extraction of groundwater is for water supply to residential areas such as towns and industrial areas, it requires technical measures for treatment.

**4.1.2. Current status of water environment**

**a. Water source**

*Surface water:*

The main water source in the subproject area is from Da Teh reservoir. This water source has the main role as supply for irrigation water to 2,300 ha of agricultural land of Da Teh district, with quite good water quality. Water quality is evaluated through analytical data of water samples taken in Da Teh reservoir as in Table 4.2 (and Table 4.1 shows sample location) as followed:

**Table 0-1: Location, coordinates for taking surface water samples**
Table 0-2: Analytical results of surface water in the project area

<table>
<thead>
<tr>
<th>No</th>
<th>Parameter</th>
<th>Unit</th>
<th>NM1</th>
<th>NM2</th>
<th>NM3</th>
<th>NM4</th>
<th>QCVN 08:2008/BTNMT (B1 Column)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>pH</td>
<td>-</td>
<td>6.28</td>
<td>6.40</td>
<td>6.53</td>
<td>6.22</td>
<td>5.5 - 9</td>
</tr>
<tr>
<td>2</td>
<td>TSS</td>
<td>mg/l</td>
<td>23</td>
<td>24</td>
<td>30</td>
<td>42</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>COD</td>
<td>mg/l</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>13</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>BOD</td>
<td>mg/l</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>NH₃-N</td>
<td>mg/l</td>
<td>0.31</td>
<td>0.28</td>
<td>0.33</td>
<td>0.30</td>
<td>0.5</td>
</tr>
<tr>
<td>6</td>
<td>NO₃-N</td>
<td>mg/l</td>
<td>0.058</td>
<td>0.055</td>
<td>0.062</td>
<td>0.066</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>NO₂-N</td>
<td>mg/l</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>0.04</td>
</tr>
<tr>
<td>8</td>
<td>PO₄³⁻</td>
<td>mg/l</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>0.3</td>
</tr>
<tr>
<td>9</td>
<td>Cl</td>
<td>mg/l</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>600</td>
</tr>
<tr>
<td>10</td>
<td>EC</td>
<td>µS/cm</td>
<td>11.6</td>
<td>11.7</td>
<td>11.6</td>
<td>11.6</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>TDS</td>
<td>mg/l</td>
<td>10</td>
<td>11</td>
<td>10</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>DO</td>
<td>mg/l</td>
<td>7.01</td>
<td>7.12</td>
<td>7.08</td>
<td>6.92</td>
<td>≥4</td>
</tr>
<tr>
<td>13</td>
<td>Cu</td>
<td>mg/l</td>
<td>0.08</td>
<td>0.09</td>
<td>0.09</td>
<td>0.08</td>
<td>0.5</td>
</tr>
<tr>
<td>14</td>
<td>Pb</td>
<td>mg/l</td>
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<td>0.008</td>
<td>0.007</td>
<td>0.008</td>
<td>0.05</td>
</tr>
<tr>
<td>15</td>
<td>Zn</td>
<td>mg/l</td>
<td>0.06</td>
<td>0.07</td>
<td>0.06</td>
<td>0.06</td>
<td>1.5</td>
</tr>
<tr>
<td>16</td>
<td>Dầu mỡ</td>
<td>mg/l</td>
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<td>0.08</td>
<td>0.08</td>
<td>0.09</td>
<td>0.1</td>
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<tr>
<td>17</td>
<td>Coliform</td>
<td>MPN/100ml</td>
<td>3.400</td>
<td>3.400</td>
<td>3.500</td>
<td>4.000</td>
<td>7.500</td>
</tr>
</tbody>
</table>

**Noted:**

**QCVN 08:2008/BTNMT:** National Technical regulation on surface water quality

*In which:*

**B1:** Water is used for irrigation purpose or other purposes with water quality requirement similar with using purposes as B2;

**(- -):** not yet regulation;

**KPHD:** undetected

**Evaluation of surface water quality:**

Analytical results of surface water samples in the table show that: surface water quality in the project area in general satisfies surface water standard for irrigation. Analytical parameters are under QCVN 08:2008 with BOD₅ = 4 mg/L, smaller 3 times than QCVN 08:2008, NH₃- N = 0.28 -0.31 mg/L, smaller 1.5 times than QCVN 08:2008, and other typical pollutants such as heavy metals, oil/grease, Cl⁻, PO₄³⁻, are in trace amount or undetected. DO content is in the range from 6.92 to 7.12, higher 1.5 times than QCVN 08:2008, proved that oxygen content in
water is high, ensure the development of aquatic system. Coliform parameter varies from 3,400 – 4,000 MPN/100ml, within the standard of QCVN 08:2008.

- **Underground water:**

Underground water in the project area is located in the unconfined aquifer (Quaternary aquifer, Miocene); the fissured aquifer (Pleistocene, middle Cretaceous, middle Jurassic and geological formations containing little water). Underground water quality is shown by analytical data of water samples in the project area as followed:

<table>
<thead>
<tr>
<th>No.</th>
<th>Symbol</th>
<th>Coordinates</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Latitude</td>
<td>Longitude</td>
</tr>
<tr>
<td>1</td>
<td>NN1</td>
<td>11°32'47&quot;</td>
<td>107°31'06&quot;</td>
</tr>
<tr>
<td>2</td>
<td>NN2</td>
<td>11°34'46&quot;</td>
<td>107°33'33&quot;</td>
</tr>
<tr>
<td>3</td>
<td>NN3</td>
<td>11°33’49”</td>
<td>107°33’51”</td>
</tr>
<tr>
<td>4</td>
<td>NN4</td>
<td>11°33'58&quot;</td>
<td>107°33'47&quot;</td>
</tr>
</tbody>
</table>

**Table 0-3: Location, coordinate of underground water samples**

### Table 0-4: Analytical results of underground water in the project area

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameters</th>
<th>Unit</th>
<th>NN1</th>
<th>NN2</th>
<th>NN3</th>
<th>NN4</th>
<th>QCVN 09: 2008/BTNMT</th>
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<tr>
<td>1</td>
<td>pH</td>
<td>-</td>
<td>6.08</td>
<td>5.82</td>
<td>6.02</td>
<td>7.28</td>
<td>5.5 – 8.5</td>
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<tr>
<td>2</td>
<td>NH₃-N</td>
<td>mg/l</td>
<td>0.22</td>
<td>0.14</td>
<td>0.12</td>
<td>0.48</td>
<td>0.1</td>
</tr>
<tr>
<td>3</td>
<td>NO₃-N</td>
<td>mg/l</td>
<td>0.052</td>
<td>0.032</td>
<td>0.102</td>
<td>0.056</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>NO₂-N</td>
<td>mg/l</td>
<td>KPHD</td>
<td>0.114</td>
<td>0.284</td>
<td>KPHD</td>
<td>1.0</td>
</tr>
<tr>
<td>5</td>
<td>PO₄³⁻</td>
<td>mg/l</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Fe</td>
<td>mg/l</td>
<td>0.157</td>
<td>0.096</td>
<td>0.113</td>
<td>0.748</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Hardness</td>
<td>mg/l</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>400</td>
</tr>
<tr>
<td>8</td>
<td>Sulfat</td>
<td>mg/l</td>
<td>15,0</td>
<td>26,3</td>
<td>21,1</td>
<td>160,4</td>
<td>500</td>
</tr>
<tr>
<td>9</td>
<td>Cl⁻</td>
<td>mg/l</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>250</td>
</tr>
<tr>
<td>10</td>
<td>TS</td>
<td>mg/l</td>
<td>25</td>
<td>25</td>
<td>18</td>
<td>104</td>
<td>1,500</td>
</tr>
<tr>
<td>11</td>
<td>Cu</td>
<td>mg/l</td>
<td>0.03</td>
<td>0.06</td>
<td>0.016</td>
<td>0.05</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Pb</td>
<td>mg/l</td>
<td>0.002</td>
<td>0.005</td>
<td>0.006</td>
<td>0.006</td>
<td>0.01</td>
</tr>
<tr>
<td>13</td>
<td>Zn</td>
<td>mg/l</td>
<td>0.014</td>
<td>0.009</td>
<td>0.017</td>
<td>0.011</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>Hg</td>
<td>mg/l</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>0.001</td>
</tr>
<tr>
<td>15</td>
<td>As</td>
<td>mg/l</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>0.05</td>
</tr>
<tr>
<td>16</td>
<td>Coliform</td>
<td>MPN/100ml</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

**Note:**  
QCVN 09:2008/BTNMT: National technical regulation on underground water quality;  
( - ): Not yet have regulation;
Evaluation of underground water:

Analytical results of underground water samples in the above Table illustrates that: most of monitoring parameters of underground water in the project area are in limit values of QCVN 09: 2008/BTNMT. However, NH$_3$-N parameter of all monitoring locations is over standard value. This can be explained that it is due to the fact that the soil around the project area is agricultural land, during cultivation, people use fertilizer (chemical, organic fertilizers) in order to increase production yield so that underground water quality is affected in the project area.

4.1.3 Air and Noise

The air quality in the subproject area is within the national standard. The economy is mainly agricultural production, and the industrial and service sectors are underdeveloped, thus such activities have not caused air pollution yet. According to the report on current state of the environment by Lam Dong province in 2014, the value of the parameters controlling air quality such as CO, SO$_2$, NO$_2$, dust in Da Teh district as well as in the project area are in accordance with the regulation values (QCVN 05: 2009/BTNMT).

The air quality in the project area measured by the Environmental Consultancy Unit in February 2015 is shown in the following table:

<table>
<thead>
<tr>
<th>Order</th>
<th>Code</th>
<th>Coordinates</th>
<th>Position description and sampling conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 K1</td>
<td>$11^033'20&quot;$</td>
<td>$107^032'45&quot;$</td>
<td>Flood overflow, Con O village, My Duc commune, Da Teh District. Sampling conditions: Hot and sunny weather, air humidity of 71.6%, wind speed of 0.7m/s; pressure of 100.1kPa; wind direction of East-North East.</td>
</tr>
<tr>
<td>2 K2</td>
<td>$11^034'00&quot;$</td>
<td>$107^032'54&quot;$</td>
<td>Earth dam, Con O village, My Duc commune, Da Teh District. Sampling conditions: Hot and sunny weather, air humidity of 70.3%, wind speed of 0.8m/s; pressure of 100.1kPa; wind direction of East – North East.</td>
</tr>
<tr>
<td>3 K3</td>
<td>$11^033'47&quot;$</td>
<td>$107^032'56&quot;$</td>
<td>Road to earth dam, Con O village, My Duc commune, Da Teh District. Sampling conditions: Hot and sunny weather, air humidity of 70.3%, wind speed of 0.5m/s; pressure of 100.2kPa; wind direction of East – North East.</td>
</tr>
</tbody>
</table>

Table 0-6: Results of air quality monitoring in the project area
<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>Unit</th>
<th>K1</th>
<th>K2</th>
<th>K3</th>
<th>TC 3733 /2002</th>
<th>QCVN 05:2009</th>
<th>QCVN 26:2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Temperature</td>
<td>°C</td>
<td>29.7</td>
<td>28.8</td>
<td>28.5</td>
<td>32</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Humidity</td>
<td>%</td>
<td>71.6</td>
<td>70.3</td>
<td>70.3</td>
<td>80</td>
<td>-</td>
<td>70</td>
</tr>
<tr>
<td>3</td>
<td>Vibration</td>
<td>cm/s</td>
<td>0.01</td>
<td>0.013</td>
<td>0.014</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Temporary noise (Leq)</td>
<td>dBA</td>
<td>41.4</td>
<td>50.7</td>
<td>51.2</td>
<td>85</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>CO</td>
<td>mg/m³</td>
<td>1.02</td>
<td>1.11</td>
<td>1.58</td>
<td>40</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>NO₂</td>
<td>mg/m³</td>
<td>0.011</td>
<td>0.021</td>
<td>0.025</td>
<td>10</td>
<td>0.2</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>SO₂</td>
<td>mg/m³</td>
<td>0.025</td>
<td>0.019</td>
<td>0.029</td>
<td>10</td>
<td>0.35</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Dust PM₁₀ (TSP)</td>
<td>mg/m³</td>
<td>0.04</td>
<td>0.02</td>
<td>0.09</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**
- **TC 3733/2002/QD-BYT:** Standard of microclimate and noise in working area;
- **QCVN 05:2009/BTNMT:** National Technical Regulations on ambient air quality (average 1 hour);
- **QCVN 26:2010/BTNMT:** National Technical Regulations on noise;
- **(-):** No regulations.

Most monitoring indicators are within the limits allowed under Vietnam regulations (QCVN 05:2009/BTNMT, QCVN 26:2010/BTNMT, QCVN 05:2013/BTNMT). At all monitored locations, PM₁₀ dust appears (suspended dust with aerodynamic diameter less than equal to 10 µm) within the range of 0.02-0.04 mg/m³. At position K₃, total suspended particulates are up to 0.09 mg/m³ as they are located on the route to the dam where some vehicles participate in transportation leading to increasing of the amount of dust in the air.

Noise in the project area is low, the concentration of pollutants in all samples are low. All values are within the permitted standards for ambient air quality and noise.

Thus, the air quality inside and outside the sub-project area is pretty clean and still relatively fresh.

### 4.1.4 Soil

The project is located in the area of My Duc commune, Quang Tri commune with total natural area is 16.679,10 ha, mainly for agricultural development in the region. The project area has plantation area of riverhead protective forest, flat land along edges of the hills and mountains for rice cultivation to ensure food for the communes. It also has semi-mountainous regions for development of forest and valuable special forest products.

Because the project is to upgrade, repair, ensure the safety of Da Teh reservoir, the project will not change the area of land use in the region. The project will upgrade a number of items such as dam, flood spillay, water drain. Soil sample have also been tested in the subproject area (Table 4.7 for location and Table 4.8 for soil sample results).

| Table 0-7: Location and coordinates of soil sample in the project area |

Sub-Project: Rehabilitation and Upgrading of Da Teh Reservoir
Table 0-8: Results of the soil analysis in the project area

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>Unit</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>QCVN 03: 2008/BTNMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>pH KCl</td>
<td>-</td>
<td>6.29</td>
<td>6.62</td>
<td>6.08</td>
<td>6.74</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Total soluble salt</td>
<td>%</td>
<td>0.17</td>
<td>0.24</td>
<td>0.33</td>
<td>0.16</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Total N</td>
<td>%</td>
<td>0.11</td>
<td>0.09</td>
<td>0.13</td>
<td>0.11</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Total P</td>
<td>%</td>
<td>0.06</td>
<td>0.05</td>
<td>0.08</td>
<td>0.06</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Total copper (Cu)</td>
<td>mg/kg</td>
<td>12.33</td>
<td>12.81</td>
<td>12.17</td>
<td>12.79</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>Total lead (Pb)</td>
<td>mg/kg</td>
<td>17.1</td>
<td>17.2</td>
<td>17.5</td>
<td>13.7</td>
<td>300</td>
</tr>
<tr>
<td>7</td>
<td>Cadimi (Cd)</td>
<td>mg/kg</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>KPHD</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>Zinc (Zn)</td>
<td>mg/kg</td>
<td>34.2</td>
<td>31.6</td>
<td>36.4</td>
<td>33.2</td>
<td>300</td>
</tr>
<tr>
<td>9</td>
<td>Asen (As)</td>
<td>mg/kg</td>
<td>0.14</td>
<td>0.13</td>
<td>0.17</td>
<td>0.19</td>
<td>12</td>
</tr>
</tbody>
</table>

Note:
- QCVN 03:2008/BTNMT: National technical regulation on content of heavy metals in soil;
- ( - ): No regulation;
- KPHD: Undetectable (content is too small or in the form of traces)

According to the analysis, results in the table above, the indicators analyzed are within the permissible limits of QCVN 03:2008/BTNMT for agricultural land. In conclusion, the quality of land in the project area at the time of observation, measurement is quite good, no signs of contamination by heavy metals.

4.2. Socio-economic and cultural characteristics

4.2.1 Population

According to the statistics of Da Teh District Statistical Department, the total population in the project area is 6,606 people, 1,614 households with a low population density of about 39.61 people/km². The population growth rate is 1.15% on average. The population is unevenly distributed; people mainly live in the central of commune which follows the provincial road axis, while sparsely populated in mountainous area.

In the project area, there are two main ethnic groups living, they are the Kinh and the Chau Ma, and other ethnic groups such as Tay, Nung. The Kinh present at all villages in the project area, with 1,472 households, accounting for 91.2%. The Chau Ma only live in group 8, My Duc commune with a total of 134 households, 521 people accounting for 8.3% percentage. The other ethnic groups such as Tay, Nung come from other locations to do business, get married with a total of about 8 households, making up 0.05%.
Current status of the population of the commune in the subproject area is presented in the following table:

Table 0-1: Population of communes in the project area

<table>
<thead>
<tr>
<th>No.</th>
<th>Commune</th>
<th>Total population (person)</th>
<th>No. of household</th>
<th>Male (person)</th>
<th>Female (person)</th>
<th>Population density (person/km²)</th>
<th>Rural (person)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quang Tri</td>
<td>2,702</td>
<td>609</td>
<td>1,370</td>
<td>1,332</td>
<td>42.97</td>
<td>2,702</td>
</tr>
<tr>
<td>2</td>
<td>My Duc</td>
<td>3,904</td>
<td>1,005</td>
<td>1,977</td>
<td>1,927</td>
<td>37.57</td>
<td>3,904</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>6,606</td>
<td>1,614</td>
<td>3,347</td>
<td>3,259</td>
<td>39.61</td>
<td>6,606</td>
</tr>
</tbody>
</table>

Source: The 2014 Statistical Yearbook Da Teh District

4.2.2 Economic condition

In accordance with the 2014 statement of economic and social development and Statistical Yearbook Da Teh districts, economic structure of the district in the past years is respectively agriculture - forestry, fishery - services – industry, construction with corresponding output value as follows:

- Agriculture – Forestry and Fishery: 1,111.209 mil VND, making up 46.49%;
- Services: 800.690 mil VND, making up 33.49%;
- Industry and Construction: 478.512 mil VND, making up 20.02%.

Rice and crops:

Annual rice cultivation area of the district is 7,038 hectares, the average productivity of 47.29 quintals per hectare. Annual rice cultivation area of the two communes in the project area is 433 hectares with the gross productivity varies from 553 to 766 tons. In addition to the main crops on agricultural land, there are also typical industrial plants of Lam Dong province such as tea, coffee, cashew, durian, etc.

Area, productivity and output of some plants in the project area is as follows:

Table 0-2: Productivity, output of main plants in the project area

<table>
<thead>
<tr>
<th>No.</th>
<th>Plant</th>
<th>Quang Tri commune</th>
<th>My Duc commune</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Area (ha)</td>
<td>yield (quintal/ha)</td>
<td>Output (ton)</td>
</tr>
<tr>
<td>1</td>
<td>Corn</td>
<td>49</td>
<td>66.54</td>
<td>326.05</td>
</tr>
<tr>
<td>2</td>
<td>Sweet potato</td>
<td>5</td>
<td>66.50</td>
<td>33.25</td>
</tr>
<tr>
<td>3</td>
<td>Cassava</td>
<td>64</td>
<td>209.00</td>
<td>1,337.60</td>
</tr>
<tr>
<td>4</td>
<td>Vegetables</td>
<td>14</td>
<td></td>
<td>205.00</td>
</tr>
<tr>
<td>5</td>
<td>Beans</td>
<td>19</td>
<td>16.00</td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td>Cane</td>
<td>34.3</td>
<td>2,675.00</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Cashew</td>
<td>72</td>
<td>39.00</td>
<td>1,152.0</td>
</tr>
<tr>
<td>8</td>
<td>Café</td>
<td>35</td>
<td>49.00</td>
<td>23</td>
</tr>
<tr>
<td>9</td>
<td>Pepper</td>
<td>6.4</td>
<td>17.00</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>Rubber</td>
<td>2</td>
<td>2.99</td>
<td>29</td>
</tr>
<tr>
<td>11</td>
<td>Mulberries</td>
<td>7</td>
<td>97.00</td>
<td>31</td>
</tr>
</tbody>
</table>
Livestock:

In recent years, the livestock sector in Da Teh district has developed quite slowly, the value of livestock production continued declining both in the number of livestock, poultry and meat production. Buffalo and cow have the slowest rate of growth except goats, pigs and poultry are growing regularly. Number of livestock, poultry in communes in the project area is shown in the following table:

<table>
<thead>
<tr>
<th>No.</th>
<th>Section</th>
<th>Livestock</th>
<th></th>
<th></th>
<th>Poultry</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Buffalo</td>
<td>Cow</td>
<td>Goat</td>
<td>Pig</td>
<td>Total</td>
<td>Chicken</td>
</tr>
<tr>
<td>1</td>
<td>Quang Tri commune</td>
<td>25</td>
<td>357</td>
<td>0</td>
<td>1,458</td>
<td>20,690</td>
<td>9,420</td>
</tr>
<tr>
<td>2</td>
<td>My Duc commune</td>
<td>43</td>
<td>422</td>
<td>55</td>
<td>1,854</td>
<td>47,040</td>
<td>26,500</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>68</td>
<td>779</td>
<td>55</td>
<td>3,312</td>
<td>67,730</td>
<td>35,920</td>
</tr>
</tbody>
</table>

Source: The 2014 Statistical Yearbook of Da Teh District

The use of chemicals in agriculture

According to survey data of Environmental Consultancy, the annual amount of fertilizer manured crops in the project area is less than in the plain area. However, the use of chemicals in agriculture still affects to soil, water and air. The volume of pesticides and fertilizers used for a crop is as follows:

- Nitrogen: 153 kg per ha
- Phosphates: 252 kg per ha
- Potassium: 80 kg per ha
- Pesticides: 1 litre per ha.

Due to farming practices, people in the communes often make use of manure and green manure (the easy rotten grass is chopped and then stripped out all fields) leading to the reduction of the use of chemical fertilizers and pesticides.

The pesticides that are commonly used are: Padan, Bassa Ofatoc and Monitor for vegetables. The use of pesticides is in compliance with the guidance of Plant Protection Station - Da Teh district

4.2.3 Social condition
Healthcare
Every commune in the sub-project area has one clinic with 8 beds, using clean water resource and sufficient medical instruments. Medical equipment has been equipped to meet the need of normal healthcare and medicine delivery. To date, children under 1 year of age in the communes of project area were fully immunized vaccines with a high rate: 96.2% in Quang Tri commune and 83.8% in My Duc commune.

- Malaria: with low rate recently, mainly in the mountainous areas.
- Dengue: does not appear for long time.

Number of Clinics in the sub-project area is stated as table below:

<table>
<thead>
<tr>
<th>No.</th>
<th>Section</th>
<th>No. of Clinics</th>
<th>No. of beds</th>
<th>No. of Medical staffs</th>
<th>Total</th>
<th>Doctors</th>
<th>Physicians</th>
<th>Nurses</th>
<th>Midwives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quang Tri commune</td>
<td>1</td>
<td>8</td>
<td>5</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>My Duc commune</td>
<td>1</td>
<td>8</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2</td>
<td>16</td>
<td>10</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Source: Environmental Consultancy, February 2015

Education
Communes in the sub-project area only have preschools and elementary schools. Students who are at secondary school and high school level will have to study in the neighboring villages and Da Teh town. The district has totally 8 secondary schools (located in 7 communes and towns) and 3 middle schools (located in Ha Dong commune and and Da The town). The number of educational establishments in the subproject area as stated in the table below:

<table>
<thead>
<tr>
<th>No.</th>
<th>Section</th>
<th>No. of primary school</th>
<th>No. of classroom</th>
<th>No. of pupil</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>Permanent</td>
</tr>
<tr>
<td>1</td>
<td>Quang Tri</td>
<td>1</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>My Duc</td>
<td>1</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2</td>
<td>27</td>
<td>16</td>
</tr>
</tbody>
</table>

Source: 2014 Statistical Yearbook of Da Teh District

Household income and poverty
As mentioned above, the main income source of people in the subproject area is from agriculture and forestry. Income per capita has reached 14.8 million/person/year. According to the 2014 Statistical Yearbook of Da Teh districts, the poverty rate falls to 8.29% in the district and 11.28% in the project area. Under the leadership of provincial and district leaders, a lot of poor household in the district has come out of poverty in a sustainable manner, but there is still 23 households falling back into poverty, including 1 household of Quang Tri commune. The main reason is the lack of land and water for production. Besides, there is also a number of causes such as social evils, laziness, lack of means of production, low level of education.

Table 0-6: Poor and near-poor households in the project area

<table>
<thead>
<tr>
<th>No.</th>
<th>Section</th>
<th>The poor</th>
<th>The near-poor</th>
<th>Poverty return</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of household (%)</td>
<td>No. of household (%)</td>
<td>No. of household (%)</td>
</tr>
<tr>
<td>1</td>
<td>Quang Tri commune</td>
<td>68</td>
<td>11.18</td>
<td>52</td>
</tr>
<tr>
<td>2</td>
<td>My Duc commune</td>
<td>114</td>
<td>11.34</td>
<td>123</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>182</strong></td>
<td><strong>11.28</strong></td>
<td><strong>175</strong></td>
</tr>
</tbody>
</table>

Source: 2014 Statistical Yearbook of Da Teh District

4.2.4 Gender issue in project site

a. Population by gender

In the project area, the average proportion of women constitutes 50.67% of the population (3,259 women out of 6,606 people), the proportion of men constitutes 49.33% (3,347 men out of 6,606 people). Thus, the proportion of women is higher than men.

b. Roles of gender in community activities

According to the survey, women actively participate in the training courses such as agriculture, integrated pest management (IPM) and community healthcare. Besides the usual role in the family, women also play an important role in the production. They assume most of the agricultural work such as sowing, weeding, trans-planting and selling products. Men often take on the job as plowing, irrigating and harvesting. Previously, men often take over plowing, buying seeds and raw materials such as fertilizers, pesticides and borrowing loans but now women are also involved in these activities. If having affect by flooding, the women have to be responsible for a lot of consequences of flooding.

c. Roles of gender in other income-generating activities

In order to increase income for the family, both men and women seek more jobs or participate in income-generating activities other than farming. According to a survey of Environmental Consultancy February 2015 in Da The District, there is 2,963 female employees of 4,750 employees working in the individual non-agricultural economic units (communes in the project has 149 female employees). Thus, the number of female workers in the district accounts for 62.38% of the employees working in the individual non-agicultural economic units. See detail in the table below:

Table 0-7: Labors working in the individual non-agricultural economic unit
<table>
<thead>
<tr>
<th>No.</th>
<th>Section</th>
<th>Total of labor</th>
<th>Male</th>
<th>%</th>
<th>Female</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quang Tri commune</td>
<td>79</td>
<td>62</td>
<td>78.48</td>
<td>17</td>
<td>21.52</td>
</tr>
<tr>
<td>2</td>
<td>My Duc commune</td>
<td>190</td>
<td>58</td>
<td>30.53</td>
<td>132</td>
<td>69.47</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>269</strong></td>
<td><strong>120</strong></td>
<td><strong>44.61</strong></td>
<td><strong>149</strong></td>
<td><strong>55.39</strong></td>
</tr>
</tbody>
</table>

*Source: 2014 Statistical Yearbook of Da Teh District*

**Domestic water and environmental sanitation**

According to Da Teh Statistical Department, so far, there is about 74.35% of the households in the subproject area has been using clean waters supplied from small water supply plants in the area, the remaining households use water from wells, from natural streams, surface water... In general, water resource is not hygienic. Especially when the flood occurs, most of the wells, latrines and cattle shed are flooded leading to a serious impact on the environment and health of people in the region even though sanitation has been implemented. Therefore, people in the subprojects easily get some kind of diseases such as trachoma, rashes, intestinal, particularly high percentage of gynecology in women.

Percentage of households has used salubrious toilets is about 67.41% and the proportion of households has access to power reached 98.57%. Current use of water and sanitation in rural communes in the subproject area is presented in the table below:
CHAPTER V: ENVIRONMENTAL AND SOCIAL IMPACTS ASSESSMENT

5.1. Environmental and social eligibility screening of the sub-project

5.1.1. Environmental and social impacts screening

The scope of work under this subproject include: (i) dam repair, seepage treatment, excavation, harden dam surface, upstream and downstream slopes reinforcement for erosion control; termite treatment; (ii) build or repair new drainage system at the toe downstream slopes; (iii) spillway rehabilitation, stilling basin extension, spillway crest repair; (iv) outlet works replacement; (v) upgrading access roads.

According to the result obtained from environmental and social screening of the sub-project (see Table 4.1 in Appendix A.5) and the result from potential impacts screening for environmental and social (see Table 4.2 in Appendix A.5), in the sub projects areas, there are no ecotourism activities, navigation, aquaculture, fishing or nature reserve, the rare animal and special plant species, there is also no importance physical cultural resources, no household impacted by residential land acquisition or relocation, no minority households are affected by the project implementation.

Extending the principal chute spillway from 18m to 24m will not have any major impact especially in terms the volume of water release via spillway to receiving channel. Because the receiving channel behind spillway is a large stream with its cross section 25-30m in width, slope 10-15%, hence the receiver can handle a large volume of flood discharge. The maximum flood discharge makes the head water in the receiver rising up 1-2cm only. Around the flood discharge corridor of Da Teh reservoir (5km long), there are no resident areas, no cultivation fields, or special ecological system. There is only bush and shrub. Therefore, the extension of spillway does not impact the local resident, infrastructures, and ecosystems in downstream of the project area.

Given the scope of subproject i.e, rehabilitation of dam and the currently proposed measures (in the ESIA) that aims to avoid water cut, the potential adverse impact (due to lack of water) on farming activities could be avoided, or minimized. In addition, as part of mitigation measures, dam repair activities would be done during dry season when the cropping area are minimal, and when the type of crops grown by farmers does not rely on large quantity of water to sustain the crops. However, this issue will be further assessed during the detailed design. The potential loss of income, as well as loss of other economic opportunities of local people as a result of the water restriction (to allow dam repair) has been analyzed and compensation measures have been included in RAP. This will be updated to reflect the nature and scope of impact, consultation outcomes, and relevant compensation and support packages to ensure the affected people are not worsened off, in economic term, as a result of the subproject implementation.

Most potential impacts of the proposed sub-project are mainly in land acquisition (production land), material transportation assessed at medium to low level and reverseable.

5.1.2. Ethnic minority screening

As part of the social assessment, where ethnic minority (EM) peoples are present in the subproject area— as confirmed by the EM screening (as per Bank’s OP 4.10), consultation were carried out in a free, prior, and informed manner, to confirm if there is broad community support from affected EM peoples for the subproject implementation. EM screening was conducted as
per Bank’s OP 4.10, and was done the scope and coverage of the social assessment vis-à-vis the environmental assessment (OP 4.01).

The results of ethnic minority screening showed that there are not any ethnic minority people living in the subproject area (including affected communities and beneficiaries). Therefore, it need not to prepare an ethnic minority development plan for this subproject.

A gender analysis was also done as part of the SA to understand underlying gender dimensions (from project impact perspective), and to enable gender mainstreaming to promote gender equality, enhance further the development effectiveness of the subproject, as well as the whole project. A gender action plan was prepared in the Appendix B4 of this Report).

There are 1614 EM beneficiaries households present in the sub-project area. In pursuing the development purpose of the project, these ethnic households are entitled to certain supports that are set for them in the Ethnic Minority Development Plan (EMDP) that was prepared for this subproject (please, refer to EMDP for this subproject for more details).

5.2. Positive impacts on environment and social of sub-project

Da Teh sub-project implementation provides some potential positive impacts to environment and social aspects, they are:

**Enhance Safety for the dam.** The rehabilitation of the dam under the sub-project will reduce the safety risk related to dam failure and improve their reliability of existing irrigation service.

**Improved irrigation service:** The repair of the headwork will contribute to regulate the flow of water in rainy and dry season, provide improved water supply for agricultural production and domestic use in dry season.

Besides, the phenomenon leak outlet is overcome, therefore, the water supply for agriculture and domestic use are ensure according to the original design, the initiative provides irrigation water for 2,300 hectares of crop land of My Duc commune and Quang Tri commune.

Ensuring water supply for agricultural production activities generate increased business opportunities, increase crop yields, increased labor demand in local agriculture, matching the capacity of women. On the other hand when agricultural growth and create more development opportunities in other industries.

Landscape: after the works, the landscape around the reservoir becomes more spacious and clean. Beautiful views coupled with convenient transportation will attract visitors, tourism hence increase the local incomes.

Improvement of ecological environment: Area construction ground, reservoir and upstream areas of flora, the vegetation of the ecological environment will be significantly improved by the planting of trees, forest plantation ecosystem restoration after construction works is complete.

Upstream forests and lakeside forest will be protected as well as planting, growing forest trees plus the tranquility will be a positive factors that attracting many species, especially small and medium sized mammals, birds to come to live.
**Impact on socio-economic improvement:**

Livestock and poultry will have strong development momentum. Alter the fundamental quality of life, including cultural life, life in the region will be enhanced.

Stable water supply from the reservoir to the region will contribute to stabilizing production practices and crop structure will change, increase the coefficient of land use. Upon completion of the entire canal system, canal network traffic creates smooth travel.

### 5.3. The potential negative social and environmental impacts

#### 5.3.1 The historical negative impacts and mitigation actions

*The historical accidents:* Da Teh reservoir was built in 1995. Since then, there is no serious accident happened. However, since 2008, the appurtenant structures of dam have been deteriorated and it not working at full the designed function:

The original outlet works was not designed properly, it was not safe and contribute the risk to the downstream areas, a large amount of water was leak and it was not possible to control water for irrigation.

The original width of the spillway was 24 m and was insufficient for flood water release during flood. The downstream of the spillway has been eroded deeply due to the floodwater discharged through the spillway.

Leakage through the outlet work reduced the reservoir’s storage capacity. The reservoir only has enough water to irrigate the first half of the summer – autumn crop. Water for the winter-spring - summer collection is dependent on rain water thus unrealiable, affect the crop productivity and livelihood of 1,600 households in the serviced the areas.

*Crest of dam*

The dam is a part of the operational management route. The dam crest is 600m long, 5m wide and was laid macadam in 2010; however, many sections were peeled off, forming potholes or slope failure, poor road quality. There are no items or elements securing project safety such as lighting, wheel guard, picket or station marker.
Figure 5.1: View of the dam crest from the middle

Figure 5.2: View of the dam crest from the left abutment

Figure 5.3: Lower dam face

Figure 5.2: Upper dam face

a) Upstream slope

The upper slope of dam is structured by riprap, which is uneven due to sinking and wave impacts.

b) Downstream slope

The survey shows that in the lower dam face, plants are dense and often have deep roots, which will increase risks of instability, seepage and create conditions for animals, burden and termite cave.
c) Management road

The road to Da Teh reservoir from provincial road 725 is an aggregate road through Da Teh reservoir with a length of 1.7km. The road to the dam is quite sloped, making it difficult to travel in rainy season. Two sides of road is crop land, there is no households living in there and no public construction or local infrastructures.

d) Spillway

Flood overflow discharge is arranged about 1,420m away from the dam, stone structure covered with reinforced concrete; joint by water slope and drained by tank. Overflow surface and water slope bottom are covered with good reinforced concrete, the end section is quite sloped.

The wall on overflow site was built of stone a long time ago, water drainage equipment is damaged, forming seepage flows along the wall foot both inside and outside. Some positions are peeled off. The wall is low, making soil and stone on both side flow into the water slope, plants grow alternately the wall structure. On both sides of the wall, many erosion holes appear due to surface flow and seepage flow. Lower derivation is narrow and plants are dense, which limit water drainage.

The receiver canal behind spillway is a large stream with its cross section 25-30m in width, slope 10-15%, hence the receiver can handle a large volume of flood discharge. The maximum flood discharge makes the head water in the receiver rising up 1-2cm only. Around the flood discharge corridor of Da Teh reservoir (5km long), there are no resident areas, no cultivation fields, or special ecological system. There is only bush and shrub. Therefore, the extension of spillway does not impact the local resident, infrastructures, and ecosystems in downstream of the project area.

The proposed rehabilitation works will not alter the hydrologic regime of the reservoir and the receiving downstream channel. It will merely strengthen the existing dam structures to improve safety. During construction, there will be no release of water into the La stream as the spillway overflow height is fixed and has no control gate. Expansion of the spillway will enable flood discharge capacity, ensure safety of the reservoir in case of larger flood or equivalent to design flood. As the result of hydraulic calculation, the stream segment to the receiver can ensure flood water discharge from Da Teh reservoir corresponding to design flood water level.
e) Intake

The water intake is arranged at the right abutment by reinforced concreted. Formally, it is a box culvert with control valve on upper side. The control valve is in quite good condition, the valve gate is not water-tight or leak. The wall and water apron bottom and derivation face of the intake are all peeled off.

f) Management house

According to the inspection of the reservoir actual state, no management house is arranged to the reservoir. The reservoir operator is using the head office of the factory which is 5km away for management. A worker living near the contact area is assigned to be in charge of the intake opening and closing.

5.3.2. Land Acquisition and Gender Impacts

There is no change in the scope of land acquisitions at the detailed design stage compared with FS stage.

Land acquisition and resettlement

To ensure safety of the work and prevent incidents, the Sub-project will acquire an amount of land owned by 12 HHs: along the road resulting from expansion of the dam and concreting of roads. Total permanently land acquisition is 10,000 m².

- Payment of compensation will be as follows: full payment to be made to all affected persons sufficiently before land acquisition;
- Assistance for APs who have to build their houses in the new place;
- Support people for recovering the income sources;
- Public consultation and compensation policy making: APs should be fully informed and consulted about land acquisition plan, leasing and relocation activities;
- Affected persons should be monitored regarding the restoration of production activities. (Presently, the relocated households are stable and continue production.)

Results of survey and proposals

The affected household agreed with the compensation policies and move to another place for project since 12/07/2010. All households now are settled, but some moved to other places.

Impacts on Income and living standard of local resident: The rapid number of worker in the areas, (150 workers) could increase the additional pressure on the existing infrastructures and community services of the local such as on medical care, emergency, safety, etc.), markets sanitation service, food and water supply.

5.3.3 Construction Impacts

The subproject will have some construction related impacts. Landscape will be altered by construction works, exploitation of construction materials and waste disposal. Trees and vegetation cover will be removed from the land to be acquired. Dust, noise and vibration will be generated from dam and access road rehabilitation and transportation. Solid waste and wastewater will be generated from construction sites and workers camps. Irrigation service will be disrupted during the replacement of the water intake. Loss of vegetation cover, changes in drainage pattern, erosion potential and possible sedimentation would be issues of concerns at
borrow pits. The introduction of workers and construction plants to the project area would cause social disturbance to local community. Construction activities, transportation, unloading or disposal of construction materials and wastes would cause safety risks to both local communities and the workers.

Impacts assessment has been made based on the resources to be mobilised and the volume of work under subproject listed in Table 5.1.

Table 5.1: Estimation of construction volume

<table>
<thead>
<tr>
<th>Work item</th>
<th>Number of Worker</th>
<th>Equip. (set)</th>
<th>Excavated materials (m³)</th>
<th>Filling (m³)</th>
<th>Other materials (tone)</th>
<th>Transport distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam rehabilitation</td>
<td>40</td>
<td>20</td>
<td>59,688</td>
<td>59,280</td>
<td>156,518</td>
<td>Soil: from borrow pit 200 m to construction site Construction materials: 10 km Stone: 70 km</td>
</tr>
<tr>
<td>Outlet works</td>
<td>20</td>
<td>15</td>
<td>0</td>
<td>28,940</td>
<td>22,135</td>
<td>Soil: 200m Construction materials: 10 km</td>
</tr>
<tr>
<td>Spillway</td>
<td>20</td>
<td>10</td>
<td>0.23</td>
<td>7,985</td>
<td>42,055</td>
<td>Soil: 500 m Construction materials: 10 km</td>
</tr>
<tr>
<td>Access road</td>
<td>30</td>
<td>18</td>
<td>71,039</td>
<td>83,788</td>
<td>21,746</td>
<td>Soil: 500m; Construction materials: 10 km Stone: 70 km</td>
</tr>
<tr>
<td>Management house</td>
<td>40</td>
<td>10</td>
<td>0.0181</td>
<td>0</td>
<td>4,616</td>
<td>Soil: 1 km Construction materials: 10 km</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>73</strong></td>
<td><strong>130,727</strong></td>
<td><strong>180,000</strong></td>
<td><strong>247,070</strong></td>
<td></td>
</tr>
</tbody>
</table>

The key potential impacts of the subproject are discussed below:

**Landscape modification.** Major landscape will be occurred in borrow pits and disposal areas. The potential impacts are not avoidable but manageable through engineering design measures and construction site management. In addition, the compensation for the site clearance of borrow pit has been successfully completed in 2009.

**Biological impacts.** The main biological impacts of the subproject are limited. These mainly related to tree cutting during site clearance at borrow pits, workers camp site, storage area with total land area of approximately 1.7ha including 1ha plantation production and 0.7 hectares empty land. This impact mainly occurs at pre-construction or at early stage of construction. Although these trees have economical rather than biological values, removal of trees and vegetation cover. This biological impact is insignificant as no species or areas of biological important are affected. Seasonal vegetation cover will be lost, this impact is unavoidable but reversible in temporarily acquired land.

During the rehabilitation of the dam, outlet work and the spillway, Excavation, leveling, draining the water in reservoir, spillway rehabilitation, waste generation and oil leaking, and other construction activities may cause negative impacts on water quality in the reservoir. Loose
materials falling into the reservoir may cases an increase in water turbidity, oil, greases and fuels may be leaked or washed into the upstream. These contaminants may have negative impacts on aquatic lives. However, the potential impacts will be minimal as the construction is limited in the area surrounding the dam face, outlet work and the sluices. This potential impact will be further minimized with the construction of coffer dams to be built to keep the water away from the structure but also prevent pollutants from coming into water in the main dam. Contractor will also be required to implement mitigation measures to minimise the potential impacts on the water quality of the reservoir.

Another issue from tree cutting and removal of vegetation cover will increase soil erosion progress. Dust generating from construction activity and material transportation will impact to greenbelt along the roads (access and transportation roads). The dust spreading over 400m around construction site and 500m around the transportation road. But the impact assessed at low level, because the most plant along the road are short-period cultivation plants and the rain will wash the dust on the leaves. These effects are relatively clear, but localized and short-term influence to the ecological system.

**Increased level of dust, gas emission, noise and vibration.**

- **Dust**
  Increased level of dust may be resulted from site clearance, excavation, leveling, truck hauling, loading and unloading loose material, waste disposal, road rehabilitation, and transport vehicles. Concrete batch mixing and road traffic on unpaved roads combined with idling of vehicles can generate air born dust (suspended particulate matter) and gaseous emissions such as NOx, SOx and carbon monoxide. Dust can be released from unwashed machine and transportation vehicles, especially in a sunny days or drying season the dust clouds can upraise to 200m height in the air.

  **Dam.** The volume of construction materials includes 12,200 m$^3$ of sand, 12,972m$^3$ of stone, 3,865 tons of cement, 398 tons of steel. These materials are transported from Da Teh Town with distance of 10 - 70km transportation to construction site via national high way 1A, provincial road DT 725. The transportation route will also pass the Da Teh district.

  **The outlet work.** The volume of construction material includes: 112m$^3$ of concrete, 18 tons of steel.

  **Spillway.** The volume of materials transporting to construction site 1,500m$^3$concrete, 173 m$^3$ of stone, 12 tons of steel. The material transportation routes will increase dust contents into environment of My Duc village.

  **Access road rehabilitation.** The transportation construction materials: 1,859 m$^3$ of concrete, 35 tons of steels, 2,500 m$^3$ of stone.

  Management house: The volume of materials transporting to construction site 4m$^3$concrete, 70 m$^3$ of stone, 5 tons of steel. The estimation volume of dust generating from contruction phase are 1,609 tones as shown in Table 5.2 below:

---

**Table 5.2. The estimated dust volume**
The total dust generated from these activities from construction activities is estimated at approximately 1.6 tons. It may cause decreases in air quality and also affect the health of the construction workers and the communities living in the vicinity of the project area, particularly along the access road, borrow pits and the disposal sites.

Total dust generating from those material will be 32kg. Dust (include high contents of NO$_2$, CO, CO$_2$) can cause respiratory and skin diseases, general suspended particles in the air maycause nuisance, constraint visuability and harm the worker health on site and local resident living nearby. The impact assessed at moderate level.

**- Gas emission**

The gas emission is expected from transport 15,724 m$^3$ of solid waste to disposal site by using diesel engine trucks with distance of 500m. Thus, in order to transport all the waste soil to disposal site, it need 2,877 trip of transportation vehicle (loading rate 7 tons per time). The construction materials (sand, cement, steel) will be transported to construction site by using 10 tons truck and so need 5,689 times of transportation. The estimated volume of exhaust gas emitted from the project is shown in Table 5.5 below.

<table>
<thead>
<tr>
<th>No.</th>
<th>Content</th>
<th>Emission (g/m$^3$)</th>
<th>Transportation volume (m$^3$)</th>
<th>Estimated volume of dust (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Earthworks, ground leveling</td>
<td>1-100</td>
<td>15,724</td>
<td>1,572</td>
</tr>
<tr>
<td>2</td>
<td>Material off load (cement, soil, sand, stone...) by using machinery.</td>
<td>0,1-1</td>
<td>32,248</td>
<td>32</td>
</tr>
<tr>
<td>3</td>
<td>Cement mixing, concrete casting</td>
<td>0,1-1</td>
<td>3.475</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Construction material falling down from transport vehicle</td>
<td>0,1-1</td>
<td>1.863</td>
<td>2</td>
</tr>
</tbody>
</table>

**TOTAL** | 53,311 | 1,609

The impact assessed at moderate level.

**Increased noise level and vibration**

In pre-construction phase, three types of construction machines will be used. Average noise of bulldozer varies from 77-95 dBA, soil excavator is 72-96 dBA and truck is 70-96 dBA, while the permitted noise for bulldozer and excavator is 90 dBA, truck is 88 dBA. Thus, the level of noise generated from these construction machines will be below the allowable level.

During construction phase, with a set of 73 machines and equipment working on site, this impacts generating from clearing, grading, excavation, levelling, truck hauling, stockpiling, waste disposal, road development, transport vehicle, and on site construction. It contributes an inconvenience condition to the people living around the sites and to the workers. If high frequency and high level of noise in long time exposure, some negative impacts will occur to
the people and worker, reduce the yield of words, causing fatigue, stress, etc. But these impacts are most likely insignificant impact due to the resident areas located from construction areas (>500 m).

The duration of impact is anticipated to be low as appropriate mitigation measures shall be applied during the construction phase.

**Solid waste from site clearance and excavation.** Solid waste will be generated from site clearance, removal of top soil layer, debris from construction and campsite;

**During pre-construction phase,** solid waste will be generated from tree cutting, removing the top soil layer, debris from camp and storage area sites; 80 m³ of waste soil, broke stone are expected to be generated by refill the excavated areas in the borrow pit. The tree cutting in the clearing areas handled by household, because the compensation plan included the cost of tree cutting to the affected household and clearing ground 20 workers are expected to work at pre-construction will generated 10 kg of solid waste each day.

**During construction phase,** the volume of soil to be excavated from construction items is 95,724 m³, the volume of soil to be reused for filling is 80,000 m³, the residual volume of 15,724 m³ will be dumped at disposal site by dump truck, 500 m distance from dam.

150 workers and staff will be working at construction site, the estimated volume of domestic waste generating is 75 kg of waste /day (equal 0.5 kg of waste/person/day).

The volume of construction solid waste generated under the subproject to be disposed of under the subproject will be approximately 15,724 cubic meters (from the dam, spillway and outlet) plus domestic waste from workers camps. With the 1,500 m² of disposal site, the dump will be approximately 5m higher than the existing ground elevation, equivalence 7,500 m³ of wastes generation dumping into landfill areas, the rest will be used to fill the excavated part in borrow pit. Social and environmental implications associated with solid waste disposal site may include:

- Loss of existing vegetation cover and trees planted at the disposal site
- Erosion potentials related to new barren soil surface exposed to win and surface runoff
- Disruption to existing drainage pattern and potential localised flooding by rain water
- Slope stabilisation issues
- Interrupt access to the nearby cultivation land, houses, and existing infrastructure, if any
- Safety risks to workers and local community along the 0.5 kilometer transporation route and nearby the disposal site

**Construction wastewater.** Construction wastewater is generated mostly from the activities such as concrete mixing, vehicle washing, machine and equipment cleaning, and construction material preparation. The estimation volume of construction wastewater at each site is from 3m³ to 5m³/d. Construction wastewater contains high suspended solid, inorganic matter and debris, low pH. The main small impacts of this wastewater are causing sedimentation in local canal systems and downstream areas and can be managed through site management measures. But with low wastewater. According to the research of Centre of environmental engineering of Ha Noi University of construction, the discharge and concentration of pollutant factors in wastewater are shown in table 5.6:

| Table 5.6: Discharge and concentration of pollution substance in construction wastewater | 50 |

Sub-Project: Rehabilitation and Upgrading of Da Teh Reservoir
Waste and wastewater from workers’ Camps. Calculation of domestic waste and wastewater generated by workers will be based on 0.5 kg of solid waste per day and 48 L of wastewater per day. As indicated in the first chapter of the report, construction of access road take place in 18 months. Taking the most disadvantage case, i.e. one group working on each work item most of the time there will be up to 150 workers working at the site.

Up to 75 kg (150 *0.5kg/day) of domestic solid waste will be generated from the camp each day, total amount of domestic solid waste during the construction phase will be 40 tones. Improper management of such waste may pose health risks to workers and cause environmental pollution. Domestic waste storage, collection and disposal should be carried out properly under camp management plan (collect, storage and transport have to follow the regulation to protect environment and sanitary)

Domestic wastewater contains high suspended solid, organic matters, nutrient (nitrogen and phosphorus), and micro organism. Discharge of untreated domestic wastewater may cause pollution to soil and water. However, even with 150 workers at the site, the daily generation rate from construction camp will be 7.2 m$^3$ (150*48L) of wastewater, the total volume of waste water during the construction phase will be 3,888 m$^3$ (18months*30days*7.2 m$^3$) which is easy to mange through camp management plan.

Table 5.7: The estimation of domestic wastewater generating in phase (Counting for 150 worker and staff on site)

<table>
<thead>
<tr>
<th>No</th>
<th>Contents</th>
<th>Unit</th>
<th>Volume$^1$</th>
<th>Estimation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BOD$_5$</td>
<td>g/person.day$^{-1}$</td>
<td>45 – 54</td>
<td>6.7 – 8.1 (kg/day)</td>
</tr>
<tr>
<td>2</td>
<td>SS</td>
<td>g/person.day$^{-1}$</td>
<td>72 – 102</td>
<td>10.8 – 15.3 (kg/day)</td>
</tr>
<tr>
<td>3</td>
<td>TSS</td>
<td>g/person.day$^{-1}$</td>
<td>70 – 145</td>
<td>10.5 – 21.7 (kg/day)</td>
</tr>
<tr>
<td>4</td>
<td>NO$_3^-$</td>
<td>g/person.day$^{-1}$</td>
<td>6 – 12</td>
<td>0.9 – 1.8 (kg/day)</td>
</tr>
<tr>
<td>5</td>
<td>Coliform</td>
<td>MPN/100 ml NT</td>
<td>106 – 109</td>
<td>15,900 – 16,35 MPN/100 ml NT</td>
</tr>
</tbody>
</table>

The subproject will manage the waste and wastewater from workers camp through contractor’s contractual obligations.

Overflow of rain water (run-off): the overflow of rainwater is likely occurring at construction site in the rainy seasons with the average rainfall in the areas is 3.300 mm/year. However the construction phase only takes place in dry season, so the wastewater generating from overflow of rain water can be negligible.

Hazardous Waste Generation.20 vehicles of different types operate regularly on the construction site. Average amount of oil used for exchange is 18 liters/vehicle, 2 times/vehicle/year on average (real construction time). With about 20 vehicles, about 2,160

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$^1$ Sources: Environmental management in developing countries, series 1
liters waste oil is discharged during the construction period. Oil overflow from construction devices or machinery cleaning water may cause pollution and reduce quality of water resources and aquatic ecosystems. The pollution level of gasoline is high volume and, the impact on the environment can limit if it applying a good hazardous waste management plan on the site before returning it to the gasoline supplier.

**Changing water flow pattern or water quality:** the activities of the project in this phase can be modified the local flows pattern due to increase water discharge into Da Teh stream. Wastewater generating from domestics activities in workers camps, washing equipments, vehicles and concrete mixing shall be a main pollutant sources to soils, surface water a and ground water resource. Wastewater containing high pollutant factors such as high TSS, organic matters, and pathogens. Also, run-off water (from construction site) can be an extra pollutant factors. The volume of wastewater generating from camp site and onsite is 3,888m³. Untreated wastewater or inadequacy treatment method can pollute water and soils resources in the local area. Hence, the mitigation measures for the issues related to site and camp management are necessary to manage the impacts of solid waste and wastewater.

**Increased risk of erosion and sedimentation and localised flooding risks.** With large amount of earth work, erosion may occur in construction phase of dam repair, spillway and access road rehabilitation, at borrow pits and disposal areas. Especially, localised flooding may happen at construction site, borrow pits or disposal areas if existing drainage pattern is disrupted. Floodwater runoff through excavated slopes may cause increases in erosion risks and that turbidity water flow cause increased turbidity and sedimentation in receiving rivers or canals downstream of My Duc commune. This potential impact and risk is manageable through site management plan.

**Traffic disturbance and increased traffic safety risk:** rapid increase in number vehicles in a small area will increase pressure on traffic condition in area, especially in the transportation routes along the 3.8km of the DT 725 road, the roads to the borrow pits and disposal site. It is estimated that 8,566 trips of vehicles with loading rate from 7 to10 tons will travel via Da Teh’s local road in 18 months, an average of 15 transportation times per day causing increased traffic safety risks to the local residents. However, this impact is manageable.

**Damage to local roads and existing rural infrastructure.** Approximately 8,566 trips of construction vehicles travelling through the access road, between the construction sites and borrow pits, disposal sites would cause damages to the existing road. Particularly, the exiting the 3.8 km local road from DT 725, local roads to borrow pits and disposal sites can be easily damaged by heavy trucks. The roads would become muddy in rainy season, dusty in hot weather, become difficult and unsafe for local people to travel. On the other hand, most of existing rural infrastructures such as power poles, drainage channels, or irrigation canal are weak can be damaged easily. The areas of worker camp, borrow pit and landfill are located in unused land areas, and therefore the local infrastructure won’t impact by the activity. The potential impacts on the road is unavoidable but reversible with road surface reinstatement when construction is completed, damages to other existing infrastructure can be avoidable or reversible.

**Health and Safety risks.** During pre-construction phase, tree cutting, site clearance and ground leveling may cause accidents to worker or local people. Health risks for workers and local people can be from a number of sources and reasons. These can be (i) Domestic waste and wastewater generated from the workers camp and other construction sites but not being managed properly; (ii) Stagnant water, wastewater attracts and create breeding ground for mosquitoes, flies, the diseases transmission vectors, infectious diseases could break out from
the polluted environment; (iii) The hazardous material such as termite chemicals, oil if not managed properly can direct enter water sources and cause harm to the health of users; (iv) Residents living along transportation route and workers at construction site can be affected by dust, noise and vibration. These impacts can be managed by applying appropriate mitigation measures.

During construction phase, heavy trucks travelling on local roads will increase the traffic accident risks, especially along sensitive parts such as schools or resident areas. Improper operations of machine may also lead to accident to workers and/or local people present at the site. This potential impact is at high level but can be minimised by an appropriate mitigation measures, particularly the application of WBG’s guidelines on Environment, Health and Safety.

On the other hand, there are also safety (fire and accidents) risk related to the generation, usage, storage or handling of electricity, flammable liquids, vapours, and gases, and combustible dusts. This risk is manageable through Site Safety measures.

**Unexploded Ordinance (UXO).** Some unexploded mines and explosive materials may be left from the war and pose safety risks to the workers if these are not cleared before construction is started. Da Teh reservoir was built in 1995, after Vietnam war, so that most areas in the project are cleaned from land mines and explosive materials. The areas of landfill, access road and borrow pit still require to clean, total expectation of land is 17,000m². In additional, these areas are in the unused land and far away from resident areas, so that risk of OXO assess at low level, just happened only to squad team. The project will have to contract specialised defence force to carry out mine clearance before construction commencement. The relevant guidelines on UXO management is provided in Appendix A.11.

**Sedimentation.** The auxiliary areas and borrow pit are located in downstream of reservoir hence it is a not sources of reservoir sedimentation. But it is a main problem to irrigation canals and Da Teh stream. However, these activities are implemented in dry season, so these impacts are assessed at low level.

**Borrow Pits.** Opening of new borrow pit will cause negative impact on the landscape, affect existing natural drainage pattern, increase erosion potentials when the existing vegetation cover is replaced with barren soils, cuts and fills, slopes are created. Landslides and sedimentation risks may also be increased in the borrow pit area. Discharges from borrow pits, dust and debris created during transportation of materials can significantly impact surface and subsurface waters because of the sediment in water and runoff from material storage and handling areas. For the Da Teh sub-project, the borrow pits are located in downstream of reservoir, thus addition of sedimentation loads from the borrow pit to the reservoir will not happen. Abandoned borrow pits might spread vector-born diseases, especially when stagnant water accumulates. These impacts can be managed by appropriated mitigation measures.

To mitigate impacts in the construction area, land gradients and drainages shall be maintained for proper discharge of wastes. Measures shall be taken to confine activities to designated locations and to minimize the creation of dust and debris during transportation. Protective measures shall be implemented during transportation (i.e. covering loads, reduced travel speeds etc.). All disturbed areas shall be properly reclaimed after construction and, slopes shall be re-contoured and proper drainage facilities will be maintained.

**Disruption to water supply.** The Da Teh reservoir only supply water for irrigation. It was built to supply water to irrigate 2300ha of agricultural land. Construction work will disrupted water and lower the water level, thus no effect to irrigation water supplies downstream. During
construction of new outlet will carry out on the dry season, and will built a coffer dam with combined diversion thus ensuring irrigation water for agriculture land.

**Termite Treatment.** Specific chemical will be used by authorised licensed consultant for termite treatment. Handling and usage of such chemical may pose health risks to the worker and the environment. Annex-Termite Treatment Procedures provide basic information on termite treatment process as well as safety requirements.

*Impact on aquaculture, tourism and inland water way transportation at downstream:* These activities are not known to be existing at downstream. Therefore the sub-project would not have any impact to these activities.

In summary some sources and some scopes of impacts during construction phase have been summarized in Table 5.8.

**Table 0-8: Sources and scope of impacts in the construction phase.**

<table>
<thead>
<tr>
<th>Sources</th>
<th>Scopes of Impacts</th>
</tr>
</thead>
</table>
| - Noise: (i) Active transport of construction materials; (ii) construction activity; (iii) operate excavation and filling; (iv) operation of construction equipment at site. | - Within the scope of 15m compared with emissions and noise from 70-96 dB  
- When the distance of 250 m, the noise reached QCVN 26:2010/ BTNMT  
- Near the site, there is no household living.  
- Affects about some households living along the transit routes.  
- Focusing workers  
  - The conflict between workers and the local people  
  - The potential risks arising of social ills.  
- Transporting building materials | - Deteriorated of road from DT 725 to site about 3.8 kilometers  
- With potentially increasing traffic accidents in the area.  
- Construction Activity | - Safety reservoir  
- Purchase and sale of construction materials and services | - Improving people's income.  
- Promote economic and social development in the region.  
- Risk cofferdam | - Affect the quality of water for 2,300 ha  
- Only occurs for a short time.  
- Risk of fire incidents | - Seriously affected 150 workers directly involved in labor  
- Risk of occupational accident | - Seriously affected 150 workers directly involved in labor  
- Risk of traffic accidents | - Due to the increase in traffic density potential risks of traffic accidents during the transport of materials.  
- Dust and gas emissions: (i) Activities earthworks, leveling; (ii) transport operations, loading and unloading of materials; (iii) equipment, | - Volume transport of building materials is 410,000 ton.  
- Total of excavated soil is 100,000 m$^3$  
- Air pollution with a radius of 400m around the site and along the route to the site from land mines.  
- Dust coated the leaves around the project area and along the transport route affecting the photosynthesis process of plants. The area affected trees about 2 ha. |
<table>
<thead>
<tr>
<th>Sources</th>
<th>Scopes of Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>construction machinery on construction sites.</td>
<td>- The health of the workers and the people, causing respiratory diseases, especially children, the elderly and women.</td>
</tr>
</tbody>
</table>
| Wastewater: (i) domestic wastewater; (ii) Waste water from construction activities; (iii) Rainwater runoff | - The amount of waste water worker is 8.1 m³/day  
- The amount of construction waste water is 1 m³/day  
- Rainwater runoff volume is 12,000 m³/year calculated for construction in dry season  
- The amount of this waste water if spilled environment will contaminate ground and surface water and groundwater in the area.  
- Affect health, causing intestinal disease of 150 workers. |
| Solid Waste: (i) domestic waste; (ii) construction waste; (iii) hazardous waste. | - Trees luminescent volume estimates 79.6 m³  
- Domestic waste: 75 kg/day  
- A negligible amount of packaging, containers of fuels such as gasoline, oil.  
- The health of 150 workers from the decomposing waste, enabling pathogenic microorganisms grow, especially infectious diseases. |
| Construction of intake repair | - Construction work mainly in reinforcing the culvert and replace the valve so that at the time of the dry season to the upstream coffer dam elevation 142.00 m combined diversion through intake by D150 PVC drainpipe should still ensure water for irrigation in the dry season farming land. |
| Impacts by lowering the water level | - Sub-projects do not lower the water level. Cofferdam will be built around the new intake position in the dry season so the water level remains normal place in the course of construction of new intake. |
| Impacts by improving the crest | The construction plans are needed to ensure the safety of the dam and does not increase the reservoir capacity for:  
- Improving the crest Zdd +158,5m to Z = +159.0m because: before, do not calculate the frequency of extreme floods, However, as recommended by the World Bank and the dam safety manuals, design consultants calculate dam safety check flood frequency according to 0.01% for results:  
- \( Z_{0.01\%} = +159.00m > Z_{dd} = +158.50m \)  
- So, if not improve, the flood crest overtopping the dam will cause unsafe ground. When raising the dam from Zdd +158.5m to Z = +159.0m is not lasted long crest that crest more: \( L_{old} = 600m; L_{new} = 700m \) was leveled by rising 100 meters of dump materials right shoulder crest of dam.  
- Before no breakwater wall, after rehabilitation elevation of breakwater wall will be 0.8m  
So improving the crest, increase the length of the main dam is only intended to improve dam safety without increasing the capacity of the reservoir or water level. |
5.3.4 Potential Impacts During operation phase

Activities
During the operational phase of the main activities related to the project is:
- Reservoir operation: opens the offtake to supply water for agricultural activities and living of the people in Quang Tri and My Duc
- Agricultural production activities mainly rice cultivation on 2,300 ha

Most of the potential impacts during operation phase are expected to be positive during operation phase. Temporary construction impacts such as dust, noise and vibration etc. will be stoped during operation phase. When the construction is completed, the land use, landscape, local income and social economic tend to be stabilised. Improved dam safety and improved irrigation service would promote socioeconomic development and livelihood improvement for downstream communities. Some will change the status quo than in the past.

Pest Management in relation to increased irrigated crop land. The area of crop land to be irrigated will be increased after the reservoir’s headworks have been rehabilitated. Meanwhile, the use of agrochemicals in agriculture is popular in Vietnam. Improper usage and handling of agrochemicals may harm the environment and cause health risks to the farmers. The sub-project will include Integrated Pest Management training for farmers to reduce the risks related to agrochemical use in extended serviced areas of the subproject.

a. Affected objects
- Landscape and ecological environment: improving the ecological environment, local traffic conditions and aquatic system.
- local economic development, increasing and stabilizing agricultural and aquatic cultivations
- Community health and safety: improving local health and safety
- Air, water and soils. May increase the pollution due to use chemical to agricultural activities.

b. Impacts on environment and social aspects

Sedimentation: during operation phase, several impacts can be occurred, such as increased sedimentation in the reservoir and may be caused alteration of existing fish species. Increased sedimentation behind impoundment will lead to downstream impacts. As the sediment load increases, fish habitats may be modified (e.g. rocky river bed to mud cover) in long run by affecting spawning areas, and reduce primary production and fish food. Measures will be implemented to protect forests of the Da Teh watershed to reduce erosion leading to sedimentation of the reservoir. Continuous monitoring and modelling of sedimentation shall also be carried out.

The duration and magnitude of the impact will be high as sediment load is expected to increase throughout the operation phase resulting in loss of fish species and poor water quality. The geographic extent of the impact will be moderate as there will be direct impacts on downstream users and aquatic life. The likelihood of occurrence of the impact will be high if sediments will decrease the quality of water and destroy breeding and spawning areas. The reversibility is considered low. The residual impact has been assessed to be high as impacts will occur throughout operations. It will bring significant changes to aquatic and human environments.

Ecological impacts: The subproject would not cause any potential negative impacts to the downstream ecosystems in operation phase. The rehabilitation of the main dam and spillway,
replacement of the outlet work would not lead to any changes in hydrology at downstream. As described earlier in the baseline section, the streams that feed water to the reservoir are also dry in dry season, there is no natural flow even the flow in these streams have not been regulated by any structure. Since construction of the dam, water from the reservoir is released either through the outlet work, or the spillway. While the outlet work is connected directly to the irrigation system, the water in the spillway channel only exists in flood water.

*Risk of dam safety:* Dam Safety Risks have been assessed and mitigation measures were proposed in detail in a separate Dam Safety Report prepared for the subproject.

In summary, Table 5.8 provides the sources and scopes of impacts during operation phase.

<table>
<thead>
<tr>
<th>Source</th>
<th>Scope of impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply and distribution of water for irrigation</td>
<td>- For irrigation of 2,300 hectares of agricultural land belonging to two commune, My Duc and Quang Tri.</td>
</tr>
<tr>
<td>Domestic wastewater operators of reservoir</td>
<td>Domestic wastewater generated in one day is about 0.32 m$^3$. This waste water is considered to be very small not affect surface water environment.</td>
</tr>
<tr>
<td>Solid waste of workers operating the reservoir</td>
<td>The amount of waste generated in one day is about 2.5 kg</td>
</tr>
<tr>
<td>The impact of the increase in irrigated area leads to increased amounts of fertilizers and plant protection drugs</td>
<td>The process of rehabilitation and upgrading only ensure dam safety without increasing irrigated area, remained at 2,300 hectares irrigated area.</td>
</tr>
</tbody>
</table>
CHAPTER VI: ALTERNATIVE ANALYSIS

Several alternative solutions were considered in the pre-feasibility study and feasibility of sub-projects, as follows:

6.1. No action alternative

6.1.1. The existing project items of the subproject

Da Teh reservoir include 01 earth dam length 600m, catchment area 198.0km², 01 spillway concrete wide 18m, 01 intake length 140m và 1,700m road. Storage capacity of the reservoir is 24,000 thousand m³, 2,300ha irrigation agricultural land. All project items are now active.

6.1.2. The safety problems of reservoir and dam

After more than 20 years has developed and exploited, works was actually serve effectively for agriculture, tourism, improve improve the lives of people. Since then has contributed promote the economic and social development, environmental rehabilitation and landscape ecological balance in the region. However the used extraction system works much expression exist:

- About the exploitation capacity is only achieved approximately 70% of the performance about irrigation
- Permeability coefficient, water permeable small dam negligible. However at the dam location right shoulder while reaching normal water level of the pure water seepage.
- Total water discharge through DaTeh The flood spillway- in the rainy season (month water storage) are great.
- In the dry season flows to small reservoirs, large water demand. The management from the headworks to the channel system is still inadequate in many aspects, irrigation canal system has not been solidified, the work also opens water craft, and spread not restrict the use of water abundance in people.

6.1.3. Situation management, reservoir operation

Da Teh irrigation systems managed by the Center for exploitation of irrigation works Lam Dong directly manage, exploit and protect.

Team management and exploitation of irrigation works DaTeh 05 peoples, the technical training have been: Water Resources University 02, University of Building 01, Intermediate Irrigation 02. The organizational structure includes: 01 leaders and 04 technical staff. Head Office of the team management and exploitation of hydraulic works Da Teh at a location is about 5km headworks.

Operating procedures and reservoirs Irrigation Works Management Center Lam Dong approval, however, until now this process has not yet been approved. The contents of this process is still based on the current state of works system as well as based on the Regulations, Standards old was no longer consistent with the current regulations.

Not to apply measures to minimize environmental and social management in reservoir.
6.2. With project implementation alternative

6.2.1. Repair and upgrade project items

- Earth dam: Filled earth downstream slope, slope reinforcement upstream, downstream grass and dam slope drainage ditch; the dam termite treatment
- Spillway: Flood discharge capacity of spillway by measures: renew The flood spillway-threshold of horseshoe style, practical section oficerop, width threshold B = 24m, levelthreshold 151,7m; concrete structures M150, Reinforced concrete covered M300 thick 30cm. Coated water slope reinforcement, side walls, side wall exalted high reinforced concrete design M300. Expanding the upstream canal of the spillway.
- Intake: Repair and renovation of houses valves, replace valves and the machine opening and closing.
- House management and information systems management service:
  - Construction house managers of headworks, a grade IV standards, total usable area is 150m².
  - Construction observation system automatic water level, service of the management and operation of works.
- Road management: Management reinforced road sections, from the intake to the The spillway length 1,7km by concrete M200, thick 20cm, width 3m.

6.2.2. Improving safety in the operation of reservoir

The works repaired the upgrade will be delivered to the Center management and exploitation of irrigation works Lam Dong managed to ensure compliance with current regulations in managing large reservoirs. Measures to ensure safe operation of the reservoir as follows:

- Installation of lighting equipment; marking base to keep track of the dam;
- Construction fencing to restrict cattle grazing on the dam;
- Arrangement of the the dam observation equipment and water levels such as seepage observation, displacements, observations water level (at intake and spillway) and even rain gauge observations.
- Preparation and approval processes reservoir operation;
- Plan emergency response EPP;
- Application of measures to minimize environmental impact, in the process of social construction and management, reservoir operation
CHAPTER VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

7.1 Public consultation

Objectives
- To get the consent of the relevant agencies, local governments and communities in the sub-project implementation
- To share information about the scope of the project and its impact on the environment and society
- To increase the encourage of the participation in the community for determining the impacts of the sub-project
- To collect information about the requirement and the responsibility of the local resident and local authority on the proposing mitigation measures of the project owner, or to improve the mitigation measure in pre-construction phase or project design

7.1.1 Consultation on environmental impacts and mitigation measures

- Summary of consultation process on environmental impacts and mitigation measures is performed in Table 7.1 (also Appendix A7).
- The response of environmental consultation is shown in table 7.1 below.

<table>
<thead>
<tr>
<th>Date</th>
<th>Venue</th>
<th>Feedback</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-4/2/2015</td>
<td>CPC My Duc, Quang Tri</td>
<td>Consider to irrigate 2,300 ha of agricultural land during construction from Da Teh reservoir</td>
<td>The project owner have to respond to the entries of non-irrigated areas during construction phase</td>
</tr>
<tr>
<td></td>
<td>headquarter</td>
<td></td>
<td>Repair the damaged road if necessary</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Remove damaged layers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Resurface and hardnosed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Assessment the risk to downstream areas in case of emergency water release</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The design flood peak at $Q_{TK} = 1,143.60 \text{ m}^3/\text{s}$. The maximum flood can discharge when its peak rise at $Q_{xa} = 580.8 \text{ m}^3/\text{s}$, it will not increase the volumetric flood in receiving water behind spillway. The Da Teh stream has a large cross section and sloppy, so that flood discharge does not making overflow to the receiver channel and hence unnecessary to build a connecting canal.</td>
</tr>
</tbody>
</table>

7.1.2 Consultation of social impact assessment

Summary of consultation on social impacts is performed in Table 7.2, (Also in Appendix A.7). The response of social consultation is summarized in table 7.2 below:
Table 7.2: Social Consultant Feedback

<table>
<thead>
<tr>
<th>Date</th>
<th>Venue</th>
<th>Feedback</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-4/2/2015</td>
<td>Quang Tri, My Duc CPC</td>
<td>All participants agreed to implement the sub-project, because it will be ensured the of Da Teh reservoir in a good condition</td>
<td>- Compensate in accordance with national regulation and law</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Compensation for affected households</td>
<td>- Register worker to CPC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Ensuring the security during construction phase</td>
<td>- Worker management and working hour plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensuring safety for workers on working site, community health.</td>
<td>Use protective gears for all workers and avoid rush hours for major transportation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In the project area, there are several vulnerable groups such as children, women, aged and disable person. The owner project should take care of these group</td>
<td>Public media, job creation, increase income and training, awareness of their need and demand, since have to develop a suitable pant to help the group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The sub-project will lead to expose disease in the small areas, from worker to local person</td>
<td>Training to local people on disease, social evil avoiding and treatment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conflicts may arise between households living in watershed and household in downstream due to unequal water supply. Conflicts may arise between the affected households with non-affected households due to compensation Ensuring sufficient water supply to domestic users and to irrigation</td>
<td>Public communication plan is needed, beside of that, the project owner have to discuss with the local people about the advantage of the sub-project and compensation of affected households, about water supply during construction phase, etc.</td>
</tr>
</tbody>
</table>

Response and commitment of Project owner

- Project Owner acquires contribution ideas and has timely adjustment in design documents and simultaneously commits doing well the measures to mitigate negative impacts by subproject’s activities
- Project Owner responses to the effected households, damaged local infrastructures, environment pollutions in accordance with Vietnam and World Bank policies and regulations
- Project Owner responses to contact with local authority regularly, prepare worker management, health and safe plans
- Project Owner responsible to local traffic condition
- Project owner committed to take water from Da Teh reservoir to irrigate 2,300 ha of agricultural land of Quang Tri commune and My Duc commune. The project owner have to response to the entire of non-irrigated areas during construction phase
Following the feasibility study, the designed plan is focus only on repair the headworks and the capacity of the reservoir does not change after completing construction. On the other hand, the design flood peak at $Q_{TFK} = 1,143.6 \text{ m}^3/\text{s}$. The maximum flood can discharge when its peak rose at $Q_{xa} = 580.8 \text{ m}^3/\text{s}$, it will not increase the volumetric flood in receiving water behind spillway, in addition Da Teh stream has a large cross section, sloppy therefore it does not make overflow to the receiver channel. From the point of view, the suggestion of the community can be solved and safe.

The public consultation document, the recommendations of the CPC’s, the commitment of Lam Dong irrigation project management Unit response to report on the evaluation of environmental and social impacts are in the appendix.

7.2 Information Disclosure Plan

Information disclosure: According to the World Bank’s policy on access to information, all draft safeguard instruments, including the ESMP/ESMoP, are disclosed locally in an accessible place and in a form and language understandable to key stakeholders and in Vietnamese and English at the CPO and Bank’s InfoShop before the appraisal mission. EMP is locally disclosed at the sites and in the Vietnam Development Information Centre of the World Bank in Hanoi.

The draft ESIA report of the sub-project was disclosed in Vietnamese language on the website of the Ministry of Agriculture and Rural Development, CPO, People's Committee of Lam Dong province on 29 May 2015. The ESIA summary was sent to the Department of Natural Resources and Environment of Lam Dong, Phu Cat District People's Committee, the CPC My Duc to the community and interested organizations can access, monitor the plan of ESMP implementation.

The draft ESIA report in English was disclosed in the Bank’s InfoShop on 28 May 2015. The updated ESIA report will be disclosed at subproject sites and on the Bank’s external website by end-August 2018.
CHAPTER VIII. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The details of negative/positive impacts of Lam Dong sub-project were discussed in part V. The Da teh sub-project will not increase the water storage capacity of the reservoir. Most of the potential impacts and risks will be in the construction phase. The negative impacts generated from site clearance, excation and other construction activities, handling and transporation of materials and waste, waste disposal, borrow pit and campoperationetc. Changes in landscape in disturbed areas, particularly the borrow pits and disposal site, generation of large amount of stockpiles, increased level of dust, noise and vibration from construction activities and transportation, domestic waste and wastewatser from camps, social disturbance related to the mobilisation of workers to the sites, safety and health risks for workes and local community, disruption of irrigataion service are the key issues of concerns during construction phase. These impacts would mostly be at low to medium level, localized and reversible, and manageable. This management plan is proposed to manage these potential negative social and environmental impacts.

The key potential impact and mitigation measures of direct construction-related impacts are summarised below:

8.1 Mitigation measures

Land acquisition. Agreed to accept the compensation and allocation for investment from day 12/07/2010. All households now most stable life, some have moved to other places to live. This preparation of investment projects is not affected by land acquisition.

Limiting risk of safety related to UXO. All works must be stopped and informed to competent authority. This issue has to follow regulations of mine clearance of Ministry of Defence (circular no. 146/2007/TT-BQP dated 4/5/2006). Singing contract with specialized forces of mine clearance at area of disposal site, borrow pit, material storage area and camp site. Informing to local authority and local people duration of mine clearance. Building fence to protect area and installing sign boards for warning.

Limiting potential conflict between workers and local people. In order to limit conflict between residents of My Duc and 150 workers at construction, the following measures should be done: registering temporary accommodation for workers; following grievance redress meachnism to address conflict; encouraging social unions to show their rights and obligations in monitoring ESMP and monitoring the compliance of the contractors; creating information network among organizations, local authority, PMU and civil contractors, monitoring contractors in accessing any information of impacts during construction of project.

Limiting impact on income of households and impact on gender. Although land acquisition is compensated according to the Resettlement policies frameworks, project owner should implement some measures to increase income and reduce impacts on gender such as: participate in unskilled job at construction site; allowing land owner harvesting plants and crops before clearing site in order to make money or use as a fuel; facilitating local people (women, the poor) desire to supply food to workers to increase their income.

Limiting risk of safety and health of workers. Complying with the safety provisions under Labour law and construction management regulations. Assigning specialized staffs on environment, safety and health; installing fence, signs, restricted area at construction site. Arranging edaquate and safey accommodation for workers with clean water and sanitation.
facilities. Providing first aid equipment at camp site. Training workers about safety and providing adequately protective clothes for workers

**Limiting risk of safety and health of community.** Installing protection fence, warning signs, traffic light at construction site to avoid/prevent accidents, especially at sensitive area

**Limiting impact on landscape.** Returning top layer at disposal site, borrow pit and other disturbed area; limiting waste volume by collecting and use of cutting tree with useful purposes

**Dust control.** To mitigate impacts in the construction area, dust control measures shall be implemented on all unpaved roads and construction surfaces, particularly during dry and windy conditions and sections crossing residential houses and buildings. Production of dust and particulate materials at all times should be minimised all the times to avoid impacts on surrounding communities, and especially to vulnerable people (children, elderly people). Dust watering shall occur only during designated hours. The dust generated from stockpiles shall be controlled by compaction and the stockpiles shall not be allowed to expose for extended periods.

**The main access road to dam site.** All trucks carrying construction materials shall be covered and no vehicles shall be left idling. Regular maintenance of vehicles (daily/weekly) shall be performed at designated areas. The traffic on access and service roads shall be regulated in order to minimize air pollution. In addition, all processes shall follow the code of practice during construction and operation phase that meets the requirements of Vietnamese standard (TCVN 5939-2005).

The duration and magnitude of the impact is anticipated to be low if appropriate mitigation measures are applied during the construction phase.

**Noise minimisation.** All construction-related traffic on project access roads should be operated within speed limits. Noise levels associated with all machinery and equipment should be maintained at or below 90db where possible. In sensitive areas (including residential neighborhoods, office, schools, etc.) Transportation during peak hours should be minimized, the vehicles shall be required to slow down and banned from using horns when passing these sensitive areas.

**Biological impacts management**

Large or significant trees in camp areas and access roads should be preserved wherever possible. The application of chemicals for vegetation clearing is not allowed. Construction shall be programmed in sequence so that the scale of earth moving activities and area of exposed surface can be minimized. Re-vegetation shall start at the earliest possible. Appropriate local species of vegetation shall be used. Restoration, of cleared areas such as borrow pits no longer in use, disposal areas, construction roads, construction camp areas, stockpiles areas, working platforms and any areas temporarily occupied during construction of the project works shall be accomplished using landscaping, adequate drainage and re-vegetation. Topsoil stripped from the work areas shall be used for landscaping works, and Watercourses, which have been temporarily diverted by the construction activities, shall be restored to their former flow paths. At the completion of construction work, all construction camp facilities shall be dismantled and removed from the site and the whole site restored to a similar condition to that prior to the commencement of the works, or to a condition agreed to with local authorities and communities.

**Construction Waste Management**
Daily site clean-up, including maintenance of adequate disposal facilities for construction debris should be implemented. Debris generated due to the dismantling of the existing structures shall be suitably reused, to the best extent feasible (e.g. as fill materials for embankments). Under no circumstances any material should be disposed on in any in environmentally sensitive areas. Ensure stabilization for disposal site.

**Hazardous waste management**

Storage areas for diesel fuel and lubricants are not located within 100 meters of the camp or watercourses. Storage are of fuel or lubricants and shall be fenced and have a compacted/impervious floor to prevent the escape of accidental spillage of fuel and or lubricants from the site. Surface water drainage from fenced areas shall be discharged through purpose designed and constructed oil traps. Empty fuel or oil drums may not be stored on site. Waste lubricants shall be recycled, and not disposed to land or adjacent water bodies.

**Erosion and Sedimentation control**

Site activities shall be carefully managed in order to avoid site erosion and sedimentation of downstream waterways. Areas disturbed by construction activities shall be maintained in their existing state. The area to be disturbed should be minimal and stabilized as soon as possible. Drainage through the area should be controlled and trap sediment onsite. Install erosion control barriers around perimeter of cuts, disposal pits, and roadways if necessary. Water shall be sprayed as needed on dirt roads, cuts, fill material and stockpiled soil to reduce wind-induced erosion and dust.

**Construction Camp Management**

Recruit the available workforce whenever possible and provide appropriate training as necessary. To address potential ethnic tensions between workers and the local communities. The following general measures should be required for construction camps:

1. Be safe, has adequate and suitable facilities for washing clothes and utensils for the use of workers. The camp should have adequate toilets and washing areas for the workers expected on site. Toilet facilities should also be provided with adequate supplies of clean or potable water, soap, and toilet paper, be conveniently accessible and kept in clean and hygienic conditions at all times.
2. Effective sediment and erosion control during construction and operation of the construction work camps
3. Safe potable water is provided for food preparation, drinking and bathing.
4. There are septic tank systems for camp without causing pollution of nearby watercourses. Wastewater should not be disposed into any water bodies without treatment, in accordance to applicable Vietnamese standards.
5. Apply acceptable storage and disposal or recycling of all solid wastes generated by the labor camp and/or base camp.
6. provide medical and first aid facilities at each camp area

**Safety management During Construction**

The subproject shall be compliance with all national and local safety requirements and any other measures necessary to avoid accidents. Vehicular speed on each section of road will be under controlled. Safe sight distance will be established in both construction areas and construction camp sites. Signs will be placed around the construction areas to facilitate traffic movement,
provide directions to various components of the works and provide safety advice and warning. In school vicinity, traffic safety personnel shall be arranged to direct traffic during school hours; Maintain a supply for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction; Conduct safety training for construction workers prior to beginning work.

**Avoid damages to local infrastructure**

The subproject will hold responsible for any damage caused to local roads and bridges due to the transportation of excessive loads and shall be responsible for repair.

**Spoil Management**

The average existing ground elevation is +40,00m. Before disposal, the 0.3 m of top soil will be removed for resurfacing this site during site reinstatement. After that, the waste will be disposed off to height 5.5 m but will be reduced further to 5.0 m after levelling and compaction [should do compaction layer by layer during the entire construction period, not at the end to reach 0.5 m reduction in height. To that stage, the ground elevation on the top of the disposal site will be equivalent to existing ground level in the surrounding area. The total volume of spoil disposed of at the disposal site will be 5.5 x 10.000 = 55,000m³ [height should be calculated based on after compaction, less should be disposed of on this site and more on the borrow pit.

The remaining excavated material will be 135,051 – 55,000 = 50,051m³ for disposal at the borrow pit, from which the volume of excavated soil would be: 113,767 x 1.16-15263= 116,707m³.

The land area of the borrow pit is 1ha. Disposal of the 55,051m³ will make the dump 0.8m high while the site would be excavated to 2m deep. Thus the borrow pit will be 1.2 m lower than the pre-construction groundlevel.

**Pest management related to termite treatment.** Training IPM for local people in project area

**Use of agricultural chemical when irrigation area is extended.** Training IPM for local people in extending irrigation area (the IPM guideline is provided in Appendix A.10)

**Sedimentation before refilling.** Collecting waste in reservoir. Planting tree at upstream to avoid erosion. Limiting activities on steep land at upstream of creeks. Collecting and transporting waste before refilling.

Table 8.1 shows the mitigation plan and Table 8.2 provides the estimation of the mitigation cost.
### Table 8.1: Environmental and Social Mitigation Plan

<table>
<thead>
<tr>
<th>Impacts/Risks</th>
<th>Mitigation measures</th>
<th>Implementation responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRE-CONSTRUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land acquisition: Agreed to accept the compensation and allocation for investment from day 12/07/2010. All households now most stable life, some have moved to other places to live. This preparation of investment projects is not affected by land acquisition</td>
<td>• Detailed in the RAP report:</td>
<td></td>
</tr>
<tr>
<td>Safety risks related to Unexploded Objects (UXO)</td>
<td>• Estimate cost</td>
<td>FS consultant</td>
</tr>
<tr>
<td></td>
<td>• Contract specialised defence force for mine clearance</td>
<td>PMU</td>
</tr>
<tr>
<td><strong>CONSTRUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disruption of water supply for irrigation</td>
<td>• The construction will be carried out when reservoir will have lowest water level.</td>
<td>FS consultant</td>
</tr>
<tr>
<td></td>
<td>• Build Coffer dam with combined diversion and ensuring irrigation water</td>
<td></td>
</tr>
<tr>
<td>Social impacts: potential conflicts with the introduction of 150 workers to the project area and construction activities; impacts on household income, gender impacts from land acquisition</td>
<td>• Register the workers to local community</td>
<td>FS consultant, PMU Compensation committee</td>
</tr>
<tr>
<td></td>
<td>• Contract obligate the use of local labour for manual work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Inform and allow land owner to collect the trees and crop before site clearance to get income from these crop products or make use of these materials</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Follow Complaint redress procedures for conflict resolution</td>
<td></td>
</tr>
<tr>
<td>Impacts/Risks</td>
<td>Mitigation measures</td>
<td>Implementation responsibility</td>
</tr>
<tr>
<td>-------------------------------</td>
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<td>---------------------------------</td>
</tr>
</tbody>
</table>
|                               | • Plan to supply food to serve workers  
|                               | • Facilitate if local people (women, poor) has willingness to supply food to worker for improved household incomes  
|                               | • Engage local mass organisations unions on rights and responsibility to the ESMP monitoring and monitor the compliant of construction contractor  
|                               | • Networking between with mass organisation and local authority, PMU, construction contractors and supervision contractor in order to receive any information on impacts on time  
| Landscape modification        | • Retain fertile top soil for reinstatement at the borrow pit, disposal areas and other disturbed areas  
|                               | • Minimise volume of waste by collecting and use cut down trees for beneficial purpose.  
|                               | Contractor                                                                                                                                  |                                 |
| Biological impacts            | • Limit site clearance within designated land area and cutting down the trees outside the approved construction area is forbidden  
|                               | • the use of chemical for site clearance is prohibited  
|                               | • Record of all tree species before site clearance  
|                               | • Plantation of same species in double number after end of construction  
|                               | FS Consultant  
|                               | Contractor  
<p>|                               | PPMU                                                                                                                                                                                                                             |                                 |</p>
<table>
<thead>
<tr>
<th><strong>Impacts/Risks</strong></th>
<th><strong>Mitigation measures</strong></th>
<th><strong>Implementation responsibility</strong></th>
</tr>
</thead>
</table>
| - Impacts on aquatic lives by underwater construction activities, changes in water quality, water level | - Maintenance of tree species  
- Build coffer dam during construction phase to minimise impacts on water quality and aquatic life |  |
| Increased level of dust and gas emission from excavation and transportation  
150 workers  
Local households along the transportation route | - Watering road surface to reduce dust  
- Water vegetation covers around the site  
- Watering transportation roads,  
- Cover the material storages areas  
- Cover the truck during transporting (avoid the materials falling down on road).  
- Cover soil and material storages areas | Contractor |
| Noise and vibration  
150 workers  
About 100 households living along the access road | - The construction site of the sub-project (dam and its subsidiary works) is mainly in hamlet 8, My Duc commune. This is thinly-populated area. Only a few households living near the construction site.  
- The road for construction material transportation is through the thinly-populated area, so this impact is assessed to be small.  
- The number of vehicles/construction devices does not cause much noise, so when going through the resident area, they will not emit a large amount of exhaust.  
- Plan the transportation time in consultation with local community | Contractor |
<p>| Solid waste management | - Reuse the removed soil layer to plantation and ground levelling | Contractor |</p>
<table>
<thead>
<tr>
<th>Impacts/Risks</th>
<th>Mitigation measures</th>
<th>Implementation responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Collect, reuse and recycle excavated materials and construction wastes where possible</td>
<td>Design/preconst.</td>
</tr>
<tr>
<td></td>
<td>• Levelling and compact the disposed waste to reduce volume and avoid subside risk</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• Dispose the waste in designated areas only;</td>
<td>Operation</td>
</tr>
<tr>
<td>Domestic waste and wastewater generation from camp</td>
<td>• Build adequate sanitation facility at the camp, including septic tank toilet and</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>drainage to ensure there is no stagnant water surrounding the camp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provide sufficient containers with lids for temporary storage of domestic waste</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(40kg/d) from the camp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Arrange for regular waste collection and disposal</td>
<td></td>
</tr>
<tr>
<td>Hazardous generation</td>
<td>• Collecting and handling wasted oil following the hazardous material management</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>regulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Waste oil are stored in safe containers and away from workers camp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Waste oil containers are stored on waterproof base and protected with roof,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>warning signs and restrict access</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Contact the recycle company for hazardous material management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Return wasted oil to fuel supplier</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Do not maintain or repair vehicles at the sites, but in workshop or service business</td>
<td></td>
</tr>
<tr>
<td>Impacts/Risks</td>
<td>Mitigation measures</td>
<td>Implementation responsibility</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Changes in flow pattern, water quality in reservoir, Dong Nai rive, Da Teh stream and canal system at downstream</td>
<td>Minimize the solid or rocks falling into reservoir</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>Install toilets on construction site and camping site.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wastewater has to collected and treated in accordance with QCVN 09-2009 before discharge to environment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>After completed construction, all toilet and recycle bin have to sealed off and move out of the construction site.</td>
<td></td>
</tr>
<tr>
<td>Increased erosion risks, sedimentation</td>
<td>Selection the site of borrow pit downstream of water sources</td>
<td>FS consultant</td>
</tr>
<tr>
<td></td>
<td>Avoid clearance activity in the rainy weather</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Create and maintain embankment around the borrow pit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cover excavated and construction materials where possible.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction must be started in dry season</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disposal areas have to compact regularly.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The disposal areas, borrow pit, workers’ camping site, material storage areas should be reset in original status</td>
<td></td>
</tr>
<tr>
<td>Traffic disturbance and increased traffic safety risks, particularly along the 3.8km access road crossing My Duc village; about 100 households</td>
<td>Announce the construction schedule on public media</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>Install and maintain instructions, warning and signage boards</td>
<td></td>
</tr>
<tr>
<td>Impacts/Risks</td>
<td>Mitigation measures</td>
<td>Implementation responsibility</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>• Install and maintain warning and lighting system at night</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Damages to existing local road and the existing rural infrastructure 400m concrete roads of Cat Son commune. | • Restrict the use of trucks with load up to 7 tons  
• Any damage to local infrastructure has to report to local authority and should be repaired as soon as possible.  
• Compensate to local roads, infrastructures if damaged. | Contractor                    |
| Health and Safety risks for workers                                          | • Comply with safety regulations according to Viet Nam Labour law and construction management regulations  
• Appoint staff responsible for environment, health and safety  
• Install barrier, fence, warning signboards, restrict access to construction areas  
• Arrange safe and adequate accommodation for workers with clean water supply and sanitation facilities  
• Routine health checking  
• Provide first aid kit at the camp  
• Provide safety training and adequate protective gears for the workers  
• Awareness training on communicable diseases and HIV/AIDS | Contractor                    |
<p>| Health and safety risks for local community                                  | • install protection fence, warning signs, traffic lights to avoid accidents, particularly in sensitive areas                                                                                                      | Contractor                    |</p>
<table>
<thead>
<tr>
<th><strong>Impacts/Risks</strong></th>
<th><strong>Mitigation measures</strong></th>
<th><strong>Implementation responsibility</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Awareness training on communicable diseases and HIV/AIDS</td>
<td></td>
</tr>
<tr>
<td>Pest management related to termite treatment</td>
<td>• Training on IMP for farmers in the area</td>
<td>Consultant</td>
</tr>
<tr>
<td><strong>OPERATION PHASE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agrochemical use in extended irrigated area</td>
<td>• Provide training on IPM for farmers in extended irrigated area</td>
<td>PPMU</td>
</tr>
</tbody>
</table>
| Sedimentation in reservoir before refill | • Collect all waste in the reservoir.  
• Plant trees in watershed of the reservoir to reduce soil erosion progress  
• Limiting activity on slope land in upper stream  
• Collect, transport and dispose all waste before refill | PPMU |
| o Due to cement packaging material, chemical container, hazardous chemical left or leaked from construction sites  
o Affect fish, aquatic habitats and aquatic life | | |

Sub-Project: Rehabilitation and Upgrading of Da Teh Reservoir
In addition to the above plan, Appendix – A.9 provides the general bid specification- the standard contractor responsibilities. Further to that, the winning contractor/bidder will prepare Contractor Environment and Occupational Health and Safety Plan (CEOHSP) taking into consideration of the subproject ESMP, the bidding document requirements and explain the construction schedule, material, equipment and manpower requirement and plan for mitigating site specific issues. This plan will be reviewed by E&S consultant firm both at Provincial level and Central level. The plan will be approved by PMU with the recommendation by Central level E&S firm.

This document also provides other relevant guidelines and plan in the Appendix.

- Environmental specification in bid document and construction contract (A.9)
- Integrated pest management-IPM (A.10)
- UXO guidelines (A.11)
- Public Health Intervention Plan (B.2)
- Public consultation, Participation and communication strategy (B.3)
- Gender Action Plan (B.4)
- Grievance Redress mechanisms (B.5)
- Information disclosure, accountability and monitoring (B.6)

### Table 8.2: Estimated cost for mitigation measures

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Budget</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Waste transportation</td>
<td>10 millions</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sheets for covering materials: Watering road surface: Signal speed</td>
<td>10 x 2 Mill/unit. = VND 20 Mill</td>
<td>included in construction cost</td>
</tr>
<tr>
<td></td>
<td>boards 4 x 1 Mill. = VND 10 Mill</td>
<td>VND 5 Mill.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>VND 4 Mill.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cover sheet for trucks</td>
<td>VND 10 Mill.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cleaning road and gathering waste during transportation</td>
<td>VND 30 Mill.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Compensation for road damaging:</td>
<td>VND 80 Mill.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cover sheets for borrow pits</td>
<td>20 x 2 Mill. = VND 40 Mill.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5 mobile toilets</td>
<td>5x 30 Mill. = VND 150 Mill.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Hazardous waste management and treatment fees</td>
<td>2 years x 20 Mill. = VND 40 Mill.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Vehicle maintenance fees</td>
<td>2 years x 15 Mill. = VND 30 Mill.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Recycle bin</td>
<td>12 x 500.000 = VND 6 Mill.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Reinstate disturbed areas</td>
<td>VND 50 Mill.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Protective gears for workers</td>
<td>2 time/year x 2 years x 10 Mill. = 40 VND Mill.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Training workers about working safety and provide personal protective</td>
<td>2 twice times per year x 2 years x 30 = VND 120 Mill.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>gears according to current regulations of Vietnam</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>VND 635 Mill. (USD 29,100)</td>
<td></td>
</tr>
</tbody>
</table>

The cost of coffer dam construction and plantation will be included separately.
8.2 Environmental Monitoring Plan

Environmental Monitoring plan includes two types of environmental monitoring:
- Routine environmental monitoring to check compliance to the project environmental management requirements, to identify non-compliance or arisen issues and propose mitigation measures.
- Environmental quality sampling for verification of the effectiveness of the mitigation measures, propose corrective measures if environmental quality exceed standards.

8.2.1 Environmental Compliance Monitoring

Environmental compliance monitoring should be carried out mostly be observation on regular basis by the construction supervisor and PMU environmental officer. Since most of the impacts are construction related, PPMU will ensure appropriate supervision and monitoring of work by their staff and consultant. Table 8.3-8.7 provides suggested action to monitor the mitigation measures.

Table 8.3: Monitoring Checklist for Air Quality

<table>
<thead>
<tr>
<th>Potential Impact Source</th>
<th>Mitigation Objective</th>
<th>Mitigation Checklist (Check the following items)</th>
</tr>
</thead>
</table>
| Material transport      | Minimization of dust during transport of construction material | • Water sprayed prior transportation of rock, sand and other dust producing material?  
  • Trucks covered with tarps?  
  • Only approved transport routes are in use? |
| Material Storage        | Minimization of dust during storage of construction material. | • Location of stockpile of materials situated in sheltered areas away from sensitive areas?  
  • Covered with tarps if required? |
| Emissions from construction equipment | Avoidance of excessive emissions due to poorly maintained equipment. | • Specification of equipment as agreed in plan?  
  • Regular maintenance of equipment and vehicle?  
  • Any visible emissions from equipment and vehicles? |
| On-site Burning         | Avoidance of smoke and gases which may constitute a nuisance. | • Random checking on on-site burning in populated areas?  
  • Double check with community? |
| Dust generating operations | Avoidance of dust generating operations during periods of high wind | • In periods of high winds, any dust generating within 200 meters of sensitive sites given the direction of the prevailing wind? |
Table 8.4: Monitoring Checklist for Water Quality and Quantity

<table>
<thead>
<tr>
<th>Potential Impact Source</th>
<th>Mitigation Objective</th>
<th>Mitigation Checklist (Check the following items)</th>
</tr>
</thead>
</table>
| Uncontrolled runoff during construction work | Avoidance of inadequately planned runoff during development of staging areas, labor camps, etc. | • Runoff from during construction works managed in a controlled manner?  
• Temporary septic tank for residential labor camp? |
| Disruption of Irrigation | Avoidance of interruption to irrigation flows due to project works. | • Interruption of irrigation systems due to subproject works?  
• Coffers dam built properly?  
• Coffers dam functioning properly?  
• Documentary evidence of compensation? |
| Effects of construction camps & staging areas | Avoidance of inappropriate wastewater disposal and runoff. | • Provisions for the location and design standards for land use, drainage, health facilities, etc., are established as per plan? |

Table 8.5: Monitoring Checklist for Soils

<table>
<thead>
<tr>
<th>Potential Impact Source</th>
<th>Mitigation Objective</th>
<th>Mitigation Checklist (Check the following items)</th>
</tr>
</thead>
</table>
| Inadequate slope stabilization | Minimizes soil loss during slope creation and due to erosion and slope failure in the longer term. | • Sideslopes standards have been established to reduce erosion potential?  
• Side slopes covered with riprap, rock gabions, or other resistant plants?  
• Embankments will be stabilized by vegetation with grazing resistant plants? |
| Uncontrolled runoff from project works & labor camps | Avoids soil runoff due to poorly designed and/or maintained constructor and labor camps. | • Runoff controlled by proper siting of camps and staging areas? |

Table 8.6: Monitoring Checklist for Noise
In addition, PPMU will conduct monitoring environmental parameters by hiring qualified consultant based on the plan described in Table 8.8.
### 8.2.2 Environmental Quality Monitoring Plan

#### Table 8.8. The content of environmental quality monitoring programs during construction

<table>
<thead>
<tr>
<th>No.</th>
<th>Sample</th>
<th>Location</th>
<th>Frequency</th>
<th>Parameter</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Air quality</td>
<td>1. The embankment areas (KK01) 2. The spill way areas (KK02) 3. The access road areas (KK03)</td>
<td>One time /three months</td>
<td>- Noise  - TSP  - Vibration</td>
<td>QCVN 05:2013/ BTNMT QCVN 26:2010/ BTNMT. QCVN 27:2010/ BTNMT</td>
</tr>
<tr>
<td>2</td>
<td>surface Water</td>
<td>1. in the reservoir (NM01) 2. at the outlet of outlet works (NM02) 3. at the land fill areas (NM03)</td>
<td>Each three months</td>
<td>pH, DO, TSS, COD, Coliform</td>
<td>QCVN 08:2008/ BTNMT:</td>
</tr>
<tr>
<td>3</td>
<td>Erosion and land slide</td>
<td>Spill way</td>
<td>1 time at quarter VI</td>
<td>Scale and size of land slide</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Operation phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>surface Water</td>
<td></td>
<td>Each three months in first year</td>
<td>pH, DO, TSS, COD, Coliform</td>
<td></td>
</tr>
</tbody>
</table>

The cost of social and environmental monitoring is estimated in the table 8.9 below

#### Table 8.9: Estimated cost for Environmental and social monitoring

<table>
<thead>
<tr>
<th>No</th>
<th>Categories</th>
<th>Unit</th>
<th>Vol.</th>
<th>Price</th>
<th>Auditing</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/</td>
<td>Expert salary</td>
<td></td>
<td></td>
<td></td>
<td>336,000</td>
</tr>
<tr>
<td>1</td>
<td>Leader</td>
<td>month</td>
<td>3.0</td>
<td>25</td>
<td>75,000</td>
</tr>
<tr>
<td>2</td>
<td>Environmental expert</td>
<td>month</td>
<td>3.0</td>
<td>18</td>
<td>54,000</td>
</tr>
<tr>
<td>3</td>
<td>Hydrology expert</td>
<td>month</td>
<td>3.0</td>
<td>18</td>
<td>54,000</td>
</tr>
<tr>
<td>4</td>
<td>Ecological expert</td>
<td>month</td>
<td>3.0</td>
<td>18</td>
<td>54,000</td>
</tr>
<tr>
<td>5</td>
<td>Social expert</td>
<td>month</td>
<td>3.0</td>
<td>18</td>
<td>54,000</td>
</tr>
<tr>
<td>6</td>
<td>Assistant (3 persons x 3 month)</td>
<td>month</td>
<td>9.0</td>
<td>5</td>
<td>45,000</td>
</tr>
<tr>
<td>II/</td>
<td>Sampling and on-site monitoring</td>
<td></td>
<td></td>
<td></td>
<td>89,000</td>
</tr>
<tr>
<td>1</td>
<td>Perdiet (8 person x 10 day x 5 times)</td>
<td>day</td>
<td>400</td>
<td>350</td>
<td>14,000</td>
</tr>
<tr>
<td>2</td>
<td>Renting vehicle (10 day x 5 times)</td>
<td>day</td>
<td>50</td>
<td>1,500</td>
<td>75,000</td>
</tr>
<tr>
<td>III</td>
<td>Sample analysis</td>
<td></td>
<td></td>
<td></td>
<td>48,330</td>
</tr>
<tr>
<td>1</td>
<td>Surface Water</td>
<td>sample</td>
<td>15</td>
<td>1,826</td>
<td>27,390</td>
</tr>
<tr>
<td>2</td>
<td>Air samples</td>
<td>sample</td>
<td>15</td>
<td>1,396</td>
<td>20,940</td>
</tr>
<tr>
<td>IV</td>
<td>Logistic</td>
<td></td>
<td></td>
<td></td>
<td>35,000</td>
</tr>
</tbody>
</table>

Sub-Project: Rehabilitation and Upgrading of Da Teh Reservoir
### 8.3 Capacity Building, Training activities

#### a) Current status of environmental management capacity of project owner

Department of Agricultural and Rural Development is project owner according to the Article no. 3 of Decree no. 12/2009/ND-CP of government, perform their function of state management in implementation of project under Article no.2 of circular no. 10/2013/TT-BXD of Ministry of Construction. Department of Agricultural and Rural Development assign Irrigation project management unit which is specialized unit under Department to perform partly function of project owner in implementation of project.

Irrigation project management unit is representative of project owner, take overall responsibility in implementation of project, is responsible for developing plan, bidding dossier, negotiation of signing contract, contract award, checking, monitoring, controlling construction quality, selecting monitoring consultant as well as monitoring detail design. Irrigation project management unit collaborate with support team of district and monitoring committee of commune in actual activities at site, collaborate with agencies, maintainance and management units, local authorities of communes and water use organizations to take responsibility in management.

People’s Committee of My Duc commune and My Duc agricultural cooperatives bear responsibility to manage and operate the completed construction. Maintenance, dredging internal canal are carried out by My Duc agricultural cooperatives under monitoring of People’s Committee of My Duc commune. In addition, community supervision should be implemented regularly for construction activities of project.

According to the survey results of consultant, There is no specialized staff on environment at both Lam Dong irrigation project management unit representative of project owner and My Duc agricultural cooperative which is management unit. Staffs of them have not been trained environmental management in construction. This is the first time that Lam Dong PPMU implement a project funded by foreign budget.

#### b) Building capacity and training activities

According to the current status of environmental management capacity of PPMU, My Duc agricultural cooperative, in order to meet the requirement of World Bank’s social and environment safety policies, the training program to improve knowledge of technique and social environment management for PPMU proposed in table 8.10 below:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Office material</td>
<td>5</td>
<td>2,000</td>
</tr>
<tr>
<td>2</td>
<td>Document printing out</td>
<td>5</td>
<td>4,000</td>
</tr>
<tr>
<td>3</td>
<td>Communication</td>
<td>5</td>
<td>1,000</td>
</tr>
<tr>
<td>V</td>
<td>Management fees (50%)</td>
<td>%</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Total (I+II+III+IV+V)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Before tax</td>
<td>%</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>VAT</td>
<td>%</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(USD 35,924)
Table 8.10: Training program on environmental management

<table>
<thead>
<tr>
<th>No.</th>
<th>Contents</th>
<th>Implementation budget (VND)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Training on Sageguards policies of environmental and social of the sub-project of WB and GoV/MARD-CPO</td>
<td>1 course * 30 participants = 20 Mill.</td>
<td>Included in contract value</td>
</tr>
<tr>
<td>2</td>
<td>Building capacity on ESMP and ESMoP</td>
<td>1 course * 50 participants = 40 Mill.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Training on HIV/AIDS protection</td>
<td>2 courses * 100 participants x 40 Mill./course = 80 Mill.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Training on improving of gender equity</td>
<td>2 courses * 100 participants x 40 Mill./course = 80 Mill.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>VND 220,000,000 (USD 10,074)</strong></td>
<td></td>
</tr>
</tbody>
</table>

8.4 Reporting Requirements

Table 8.11: Reporting Requirements for ESMoP

<table>
<thead>
<tr>
<th>Responsibility for Preparation</th>
<th>Report</th>
<th>Content</th>
<th>Frequency</th>
<th>Submission to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor</td>
<td>Risk/accidents</td>
<td>Collecting information about the risks/accidents</td>
<td>within 24 hour since the risks/accident happen</td>
<td>PPMU and Consultant</td>
</tr>
<tr>
<td></td>
<td>Violations</td>
<td>Report infringes on the environmental and social management regulations</td>
<td>Within a week</td>
<td>PPMU and Consultant</td>
</tr>
<tr>
<td>Archaeology discovery (if any)</td>
<td></td>
<td>Reporting to the relevant agencies on the new archaeology discovered</td>
<td>Within 24 hour since exposure of the object</td>
<td>PPMU and Consultant and Local Cultural Department</td>
</tr>
<tr>
<td>compliance with ESMP</td>
<td></td>
<td>Reporting on the effectiveness of ESMP mitigation measures</td>
<td>Every month</td>
<td>PPMU</td>
</tr>
<tr>
<td>CSC</td>
<td>Reporting on the ESMP mitigation measures implementation</td>
<td>Effectiveness of ESMP mitigation measures of CSC the results obtained and method applied to solve the accident and remain issues from the last report</td>
<td>Every month</td>
<td>PPMU</td>
</tr>
</tbody>
</table>
8.5 **ESMP Implementation responsibilities**

Key responsibilities of PPMU and the contractors are as follows:

a) **Lam Dong-PPMU**

Lam Dong Provincial Project Management Unit (PPMU) is representative of Lam Dong DARD and is responsible for ensuring effective implementation of subproject level safeguard measures (ESMP) in close consultation with local authorities and local communities. Department of Agricultural and Rural Development is project owner according to the Article no. 3 of Decree no. 12/2009/ND-CP of government, perform their function of state management in implementation of project under Article no.2 of circular no. 10/2013/TB-BXD of Ministry of Construction. Department of Agricultural and Rural Development assign Irrigation project management unit which is specialized unit under Department to perform partly function of project owner in implementation of project.

People’s Committee of My Duc commune and My Duc agricultural cooperatives bear responsibility to manage and operate the completed construction. Maintenance, dredging internal canal are carried out by My Duc agricultural cooperatives under monitoring of People’s Committee of My Duc commune. In addition, community supervision should be implemented regularly for construction activities of project.

b) **Consultant hired by PPMU**

Consultant will carry out, but not limited to, the following tasks:

- Before the launch of the construction, confirm that (a) all compensation for land and facilities are provided and relocation and/or land acquisition/donation has been completed; (b) the subproject ESIA and/or mitigation measures for specific site are approved by Government; and (c) the above-mentioned environmental plan have been approved by concerned parties.
- During construction, closely supervise the implementation of safeguard measures throughout the construction period.
- At the completion of the construction, confirm the compliance with the agreed environmental plan and inspect any damages incurred by the contractor. If necessary, prepare an order to compensate/restore the construction sites as specified in the contracts. Contractor safeguard performance will be included in the subproject progress report.

- During construction stage, monitor the compliance with the agreed environmental plan, and maintain close consultation with the community residents, and information disclosure and timely responsive to any possible complaints from residents and general public throughout the construction duration.

- At the completion of the construction, confirm the compliance with the agreed environmental plan and inspect any damages incurred to be paid by the contractor, including preparation of an order to compensate/restoration the construction sites as specified in the contracts.

- Prepare a periodical report to the contractor and PPMU as agreed in the ESMP.

b) Construction contractor

The construction contractors are responsible for implementing mitigation measures and the mitigation costs will be part of the contract. Take actions to mitigate all potential negative impacts in line with the objective described in the ESMP. The contractor is responsible for implementation of ESMP and CEOHSP of the subproject. The Environmental, Health and Safety Manager (EHSM) will play the key role in managing the environmental and social management of the subproject. The contractor will have to follow all environmental mitigation and management measures as defined in the technical specification, ESMP and CEOHSP. The contractor has to ensure that a comprehensive Health and Safety Program in place for the workers and also nearby community during the construction period. Prior to monsoon season during construction, the contractor will ensure that all temporary or permanent drainages are free from construction related debris.

The contractor will self-monitor the mitigation measures and prepare monthly report for submission to PPMU. The provincial E&S consultant will review the monthly report. Both Provincial E&S consultant and PPMU will review the regular implementation of the mitigation and monitoring plan. In addition, the provincial E&S consultant will prepare the quarterly monitoring report and provide recommendation to further strengthen the implementation of the mitigation and monitoring plan. Non-compliance by contractor will be reported by E&S consultant and PPMU will impose penalty for any noncompliance of agreed action plan. PPMU will submit a quarterly safeguard progress report of implementation of mitigation and monitoring plan in the province to PMU within 10 days after end of quarter.

d) Independent Environmental and Social Consultant

Independent consultant will, under the contract scope, will review the effectiveness of the environmental and social plan, the contractors plan, monitor the effectiveness of the environmental and social mitigation activities. They will monitor certain percentage of the parameters to ensure that those are within the standard. They will prepare separate monitoring report of the subproject.

e) Local Community
The community will participate in environmental supervision during construction phase. Community representatives will involve in monitoring the contractors safeguard compliance. In case of there are arising environmental problems that affect the community, they will discuss directly with the contractor for corrective action and/or report to the Supervision Consultant and/or PPMU.

_Cat So agricultural cooperative is the Reservoir management and development agency:_ Take responsibility for maintenance and periodic supervision of project works and report to Lam Dong DARD and Lam Dong DoNRE

_CPO/PMU:_ CPO/PMU will guide Lam Dong PPMU staffs to carry out environmental and social management plan of subproject. Supervising the progress of subproject during construction time.

_Province and District People’s Committees (PPCs/DPCs), Lam Dong Provincial DoNRE:_ Oversee implementation of subprojects under recommendations of Lam Dong DoNRE and PPMU to ensure compliance of Government policy and regulations. Lam Dong DoNRE is responsible for monitoring the compliance with the Government environmental requirements.

8.6 ESMP Implementation budget

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Budget (1,000 VND)</th>
<th>Construction</th>
<th>Operation</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mitigation measures</td>
<td>635,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Monitoring</td>
<td>784,543</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>IPM training</td>
<td>120,000</td>
<td>160,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Capacity Building</td>
<td>220,000</td>
<td>340,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>1,759,453</td>
<td>500,000</td>
<td>USD 80,565</td>
<td>USD 22,900</td>
</tr>
</tbody>
</table>

The above cost does not include the cost of coffer dam construction and plantation.
REFERENCES

1. FS report on sub-project of Upgrading and ensuring safety of Da Teh reservoir in Lam Dong province;
2. Dam safety report on sub-project of Upgrading and ensuring safety of Da Teh reservoir in Lam Dong province;
3. Report on socio-economic situation of My Duc commune, Da Teh district, Lam Dong province in 2014;
4. Results of analyzing ground environment samples in area of on sub-project of Upgrading and ensuring safety of Da Teh reservoir in Lam Dong province;
5. Types of map:
   - Map of project area
   - Map of land use planning of land use in project area.
APPENDIX A – Environment
Appendix A1: Drawing of the mainworks
Sub-Project: Rehabilitation and Upgrading of Da Teh Reservoir
Appendix A2: Types of Map

![Map Diagram]
Appendix A3: Policy framework, institution and regulation

A3.1. Applicable National Law and Regulations

❖ Application of environmental-related legal framework
Law on Environmental Protection (2014) No. 55/2014/QH13 on defining issues on strategic environmental assessment, environmental impact assessment and environmental protection commitment for development activities. EIA report is conducted simultaneously with preparation of investment project (feasibility research report);
The Decree No. 18/2015/ND-CP promulgated on 14th February 2015 on planning environmental protection, strategic environmental assessment, environmental impact assessment and environmental protection plan;
The Directive No. 26/CT-TTg of the Prime Minister on 25th August 2014 on implementing the Law on Environmental Protection;
The Circular No. 01/2012/TT-BTNMT dated 16th March 2012 on defining formulation, appraisal and approval, inspection and certification of implementation of detailed environmental protection plans; formulation and registration of simple environmental protection plans;
The Decree No. 29/2011/ND-CP of the Government dated 18th April 2011 on providing strategic environmental assessment, environmental impact assessment and environmental protection commitment;
The Circular No. 16/2009/TT-BTNMT of the Ministry of Natural Resources and Environment dated 7th October 2009 on defining national technical regulations on environment, air quality and some hazardous substances in the ambient air;
The Decision No. 22/2006/QD-BTNMT of the Ministry of Natural Resources and Environment dated 25th December 2006 on the compulsory application of Vietnam's standards about the environment.

❖ Application of Legislative Framework on land use and recovery in the investment projects
The Law on Land No. 45/2013/QH13 approved on 29th November 2013 by the National Assembly of the Socialist Republic of Vietnam;
The Decree No. 43/2014/ND-CP dated 15th May 2014 on guiding the implementation of 2013 Law on Land;
The Decree No. 44/2014/ND-CP dated 15th May 2014 on defining land price;
The Decree No. 47/2014/ND-CP dated 15th May 2014 on compensation, support and resettlement upon land recovery by the State;
The Decree No. 37/2014/ND-CP dated 30th June 2014 on detailing the compensation, support and resettlement upon land recovery by the State;
The Circular No. 23/2014/TT-BTNMT of the Government dated 19th May 2014 on stipulating the certificates of land use right, house ownership and other assets on land.

❖ Legislative Framework on using and managing the construction of investment projects
The Law on Construction No. 50/2014/QH13 approved on 18th August 2014 by the National Assembly of the Socialist Republic of Vietnam;
The Decree No. 15/2013/ND-CP dated 6th February 2013 on quality management of construction works;
The Decree No. 207/2013/ND-CP issued on 11th December 2013 on amending and supplementing a number of Articles of the Decree No. 48/2010/ND-CP of the Government dated 7th May 2010 on contracts in construction activities;
The Decree No. 12/2009/ND-CP dated 10th February 2009 on managing investment projects on the construction of works.

❖ Legislative framework on general exploitation of water natural resources, forest protection, cultural heritages and biodiversity
The Law on Water Resources approved on 21st June 2012 by the National Assembly of the Socialist Republic of Vietnam;
The Decree No. 42/2012/ND-CP of the Government dated 11th May 2012 on management and use of rice-farming land;
The Decree No. 112/2008/ND-CP of the Government dated 20th October 2008 on management, protection and integrated exploitation of resources and environment of hydro-power and irrigation reservoirs;
The Decree No. 120/2008/ND-CP of the Government dated 1st December 2008 on managing river basin;
The Decree No. 149/2004/ND-CP of the Government dated 27th July 2004 on issuing permits for water resource exploration, exploitation and use, or for discharge of wastewater into water sources;
The Law on Cultural Heritage No.28/2001/QH10 approved on 12th July 2001 by the National Assembly of the Socialist Republic of Vietnam. Article 13 – The following acts are strictly prohibited: Appropriating or deviating cultural heritages; Ruining or posing a danger of ruining cultural heritages; Conducting illegal excavations at archaeological sites or illegal construction, encroaching upon the land within historical-cultural relics, famous landscapes and beauty spots; Illegally purchasing, selling, exchanging and transporting vestiges, antiques, national precious objects pertaining to historical-cultural relics, famous landscapes and beauty spots; illegally taking abroad vestiges, antiques and national precious objects;
❖ National policies on dam safety
The Decree No. 72/ND-CP of the Government dated 7th February 2007 on dam safety management;
The Directive of the Government at the Statement No. 21/CT-TTg dated 14th October 2013 on strengthening management and assuring reservoir safety;
The Circular No. 33/2008/TT-BNN dated 4th February 2008 on guiding a number of Articles in the Decree No. 72/ND-CP;
The Circular No. 34/2010/TT-BCT of the Ministry of Industry and Trade dated 7th October 2010 on defining dam safety management of hydro-power plants.
❖ Resettlement Policy

The Circular No. 36/2014/TT-BTNMT dated 30th June 2014 on land pricing method; compilation and adjustment to land price lists; determination of specific land prices and consultancy on land pricing.

The Circular No. 114/2004/TT-BTC dated 16th November 2004 on guiding the implementation of the Decree No. 188/2004/ND-CP;

The Decree No. 17/2006/ND-CP of the Government dated 27th January 2006 on amending and supplementing a number of Articles of the Decree on guiding the implementation of the Law on Land and the Decree No. 187/2004/ND on transforming the State-own companies into joint stock companies.

The Decree No. 84/2007/ND-CP of the Government dated 25th May 2007 on additionally stipulating the grant of land use right certificates, recovery of land, exercise of land use rights, order and procedures for compensation, support and resettlement upon land recovery by the State, and settlement of land related complaints.

The Decree No. 123/2007/ND-CP issued on 27th July 2007 on amending and supplementing a number of Articles of the Decree No. 188/2004/ND-CP dated 16th November 2004 on methods of determining land prices and assorted-land price brackets;


The Decision No. 52/2012/QD-TTg of the Prime Minister on 16th November 2012 on employment and vocational training support policies for laborers subject to agricultural land recovery.

❖ Gender policy
The Law on 73/2006/QH11 on general equality approved on 29th November 2006 on the National Assembly;


The Decree No. 70/2008/ND-CP of the Government dated 4th June 2008 on detailing the implementation of a number of Articles of the Law on Gender Equality;

The Decree No. 55/2009/ND-CP of the Government dated 10th June 2009 on sanctioning of administrative violations of gender equality;

The Decree No. 48/2009/ND-CP of the Government dated 19th May 2009 on providing for measures to assuring gender equality;

The Circular No. 191/2009/TT-BTC of the Ministry of Finance dated 1st October 2009 on guiding the management and use of budget for gender equality and activities for the advancement of women;

The Circular No. 07/2011/TT-BTP of the Ministry of Justice dated 31st March 2011 on guiding the realization of gender equality in legal aid personnel and activities;

The Decision No. 2351/QD-TTg of the Prime Minister dated 24th December 2010 on approving the 2011-2020 national strategy for gender equality.

❖ Development policy for ethnic minority community


The Decree No. 60/2008/ND-CP of the Government dated 9th June 2008 on defining functions, duties, authorities and organizational structure of the Committee for Ethnic Minorities.

The Decision No. 06/2007/QD-UBDT of the Committee for Ethnic Minorities dated 12th January 2007 on the strategy of media for the program 135-phase 2.

The Decree No. 70/2001/ND-CP: all asset registration of the family and land use rights must be subscribed with both names of husband and wife.
The Decision No. 134/2004/CP of the Prime Minister dated 20th July 2004 on some policies to support residential land, productive land, housing and clean water for poor, disadvantaged ethnic minorities households;
The Decision No. 03/2005/QD-BNN of the Minister of Agriculture and Rural Development dated 7th January 2005 on promulgating the Regulation on exploitation of timber for providing dwelling-house support to poor ethnic minority people meeting with difficulties under the Decision No. 134/2004/QD-TTg of the Prime Minister dated 20th July 2004;
The Decision No. 33/2007/QD-TTg of the Prime Minister dated 5th March 2007 on policies on price and freight subsidy and the scheme on human resource development for ethnic minority areas;
The Decision No. 32/2007/cua/QD-TTg of the Prime Minister dated 5th March 2007 on providing loans to develop production of extremely disadvantaged ethnic minority households;
The Decision No. 1592/QD-TTg of the Prime Minister dated 12th October 2009 on constant implementation of support policies on production land, residential land and potable water for poor ethnic minority households up to 2010;
The Decision No. 05/2007/QD-UBDT of the Committee for Ethnic Minorities dated 6th September 2007 on recognizing communes of three ethnic minority and mountainous regions according to their development levels.
The Circular No. 06 of the Committee for Ethnic Minorities dated 20th September 2007 on guiding support of services, subsistence improvement to improve legislative knowledge in accordance with the Decision No. 112/2007/QD-TTg

Poverty elimination
The Decision No. 33/2007/QD-TTg of the Prime Minister dated 20th July 2007 on support policies to improve the legislative knowledge in accordance with the program No. 135, 2nd phase.
The Decision No. 1956/2009/QD-TTg of the Prime Minister dated 17th November 2009 on approving the Master Plan on vocational training for rural laborers by 2020.

Vietnam standards and codes on environmental protection
(i) Water environment:
QCVN 08:2008/BTNMT – National Technical Regulation on Surface Water Quality;
QCVN 09:2008/BTNMT – National Technical Regulation on Underground Water Quality;
QCVN 14:2008/BTNMT – National Technical Regulation on Domestic Waste Water Quality;
(ii) Air environment:
QCVN 05:2013/ BTNMT – National Technical Regulation on Ambient Air Quality;
QCVN 06:2008/BTNMT – National Technical Regulation on some hazardous substances in the ambient air.
(iii) Soil environment:
QCVN 03 : 2008/BTNMT - National Technical Regulation on Allowable Limit of Heavy Metals in soil;
QCVN 04: 2008/BTNMT – National Technical Regulation on chemical residues in soil and plant protection;
(iv) Solid waste management:
(v) Vibration and noise:
QCVN 26:2010/BTNMT – National Technology Regulation on Noise;
A3.2. World Bank Safeguards policies Triggered
According to WB’s safety policies, ESIA report must combine the economic, financial, legislation, social and technical analysis of the Project to ensure the environmental and social issues are
properly concerned regarding selection of project, location and decisions related to technological solutions. Five (05) safety policies of WB should be initiated for the Project, including:

- Environmental Assessment (OP/BP 4.01)
- Object culture source (OP/BP 4.11)
- Indigenous person (OP/BP 4.10)
- Mandatory Resettlement (OP/BP 4.12)
- Dam safety (OP/BP 4.37)
**Appendix A4: Environmental and social screening**

The environmental and social impacts are screened in following table:

<table>
<thead>
<tr>
<th>Screening questions</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Is it likely for the sub-project to have significant negative impacts on natural living environment or important natural living environment?</strong></td>
<td>-----</td>
<td>----</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Losing or degrading land and water where (i) native creatures live, and (ii) people’s activities have not significantly changed basic ecological functions of the project site.</td>
<td>✓</td>
<td></td>
<td>The construction and upgradation of the sub-project will not lose land where wild creatures live.</td>
</tr>
<tr>
<td>Losing or degrading important natural living environment such as sanctuary, area protected by traditional local community (for example, unwholesome environment), biodiversity; vulnerable and rare species, species in danger of extinction.</td>
<td>✓</td>
<td></td>
<td>Temporarily recover 1ha of hill land at the right abutment in order to form material field for banking. In addition, about 7,000m² will be used as yard and shed in hamlet 8, My Duc commune (dam lower) as unoccupied land managed by the commune; there are no valuable vegetations, but bushes and grassplots. It can only be repaired or upgraded around the reservoir contact area, including overflow, dam, drain, management road (all are available). The sub-project is located in hamlet 8, My Duc commune which is a purely agricultural area, without environmental sensitive areas such as reserve, areas protected by traditional local community, etc.</td>
</tr>
<tr>
<td><strong>2. Is the sub-project likely to have significant negative impacts on tangible cultural resources?</strong></td>
<td>-----</td>
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<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Losing or degrading tangible cultural resources, structures, groups of structures, natural characteristics and landscapes that are important to archaeology, palaeontology, history, architecture, religion, aesthetics or other cultural importance.</td>
<td>✓</td>
<td></td>
<td>There are no impacts on tangible cultural resources since the sub-project is constructed only based on the project actual state. Furthermore, there are no assets or architectural projects related to archaeology, religion and aesthetics in My Duc commune.</td>
</tr>
<tr>
<td>It can result in conflicts with national laws, or international obligations in accordance with relevant international environment agreement and convention of UNESCO or impacts on famous and important vestiges useful for scientific tourism.</td>
<td>✓</td>
<td></td>
<td>The project is repaired and upgraded based on Da Teh reservoir project built in 1995. The project is surely implemented within national legal framework and international obligations in accordance with relevant international environment conventions or agreements.</td>
</tr>
<tr>
<td><strong>3. Is the sub-project likely to have significant negative impacts on land and natural resources used by ethnic minority?</strong></td>
<td>-----</td>
<td>----</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>It can result in impacts on land or territory under traditional ownership, or used or possessed by custom, and where access to natural resources is very important to the</td>
<td>✓</td>
<td></td>
<td>At the sub-project site, there are no works or houses, yards, sheds of the residents or the government. The project does not use land or territory under traditional ownership or use or possess by custom.</td>
</tr>
</tbody>
</table>

*Sub-Project: Rehabilitation and Upgrading of Da Teh Reservoir*
<table>
<thead>
<tr>
<th>Screening questions</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>stability of culture and livelihood of ethnic minorities. It can have impacts on cultural value and spirit that symbolize such land and resources or impacts on natural resource management and long-term sustainable of influenced natural resources.</td>
<td></td>
<td></td>
<td>As presented above, hamlet 8, My Duc commune having upgraded or repaired items of the sub-project is agriculture area, most population are Kinh people, there are no relevant land area, natural resources used by ethnic minority.</td>
</tr>
</tbody>
</table>

4. **Is the sub-project likely to have significant negative impacts on the population to move?**

   It results in the people’s movement or land and asset recovery on life and difficulty in recovering livelihood. ✓

5. **Does the sub-project ask for a significant dam construction?**

   Does the sub-project ask for a significant dam construction:  
   - High from 10 to 15 m or above  
   - High from 10 to 15m, with complicated design.  
   - High less than 10m but it is expected to become a big dam during the sub-project operation? ✓

   Do the sub-project activities depend on the effectiveness of:  
   - An existing dam or a dam being constructed  
   - A substation or a water supply system taking water from the reservoir controlled by a major dam or a dam being constructed.  
   - The conduction dam or downstream hydraulic structure from an existing dam or dam being constructed, where every incident of the riverhead dam may cause huge damage to the architectural and irrigational project or the water supply project funded by World Bank, are the projects depending on capacity and operation of an existing major dam or a dam being constructed in order to supply ✓

   The sub-project temporarily recover 1ha hill land at the right abutment of the earth dam to form building material field, which is managed by People’s Committee of My Duc commune and completely compensated for the subject owner in 2010. The sub-project do not appropriate agricultural land, no households have to move, nor on livelihood of the people in the project site. No households are affected by production, agricultural land, land, housing and assets on the land.

   The biggest height of Da The dam is 28m. However, the sub-project only repairs or upgrades, not construct the major dam. The safety report on the sub-project of repairing, renovating and improving the safety of Da The reservoir was made in accordance with the principles of dam safety of Vietnamese government as well as the policies of World Bank.

   The sub-project is carried out to improve capacity, ensure safety for the dam and the residents in lowlands. While repairing and upgrading, some items of the dam and the reservoir are repaired, increasing the utilization effectiveness. The dam is constructed with its actual state, not increasing capacity or irrigation area after investment.
6. Is the sub-project likely to result in purchase of utilization of pesticide?

<table>
<thead>
<tr>
<th>Screening questions</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the product formula fall within IA and IB classification of World Bank, or Does any product formula fall within type II?</td>
<td>✓</td>
<td></td>
<td>The purchase or utilization of pesticide does not fall within the portfolio of the sub-project.</td>
</tr>
</tbody>
</table>

7. Is the sub-project likely to have irreversible impacts or uneasy to mitigate impacts?

<table>
<thead>
<tr>
<th>Screening questions</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result in losing the aquifer recharging area, affecting the quality of the water store and the water store is in charge of supplying drinking water for centers of large population.</td>
<td>✓</td>
<td></td>
<td>The construction, upgradation of the sub-project items only take place in the contact area of Da The reservoir, a very small temporarily occupied area, which will not affect the quality of the water store. The land temporarily used for construction include construction plan, shed, site management house, material yard with total area of about 2 ha, allocated along the management road in an unoccupied area. Furthermore, the residents in TDA area (74.35%) are supplied with clean water for eating, drinking and living; therefore, it is unlikely that the project will affect the water store for supplying water for the resident area. The sub-project is carried out in order to supply water better for agriculture production, not having impacts on the water quality of the water store related to domestic water.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Screening questions</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result in any impacts, the period of which is quite long, affecting a very wide geographical area or impact of strong intension.</td>
<td>✓</td>
<td></td>
<td>Total construction time of the sub-project is 24 months. The construction, upgradation and repairing of Da The reservoir are carried out in dry season; there are hardly impacts in terms of irrigational water for the beneficiary area during the construction time. The repaired reservoir will ensure safety for the residents behind the dam and supply water in a stable and effective way, which gradually contribute to the economic development of the community.</td>
</tr>
</tbody>
</table>

8. Is the sub-project likely to result in a wide diversity of significant negative impacts?

<table>
<thead>
<tr>
<th>Screening questions</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Many sites in different locations are affected, each impact cause loss of living environment, resources, land or significant degraded quality of resources.</td>
<td>✓</td>
<td></td>
<td>Area for subsidiary areas for building the sub-project construction area unoccupied yard, lakeside yard. The arrangement aims at limiting at a maximum impacts of these site activities on surrounding resources and environment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Screening questions</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant negative and potential impacts may expand beyond the construction site.</td>
<td>✓</td>
<td></td>
<td>Dust may be dispersed outside the construction site, but in a narrow scope. The construction site is rural area with lots of trees, so fume and dust are easily diluted, impacts can be limited if mitigation measures are applied well.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Screening questions</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts across boundary (in addition to small changes in activities on waterway).</td>
<td>✓</td>
<td></td>
<td>The sub-project is carried out completely in Vietnam territory with no impacts across boundary.</td>
</tr>
</tbody>
</table>
The sub-project is carried out in hamlet 8, My Duc commune, Da The district; at present, no wild animals are detected, only grazed animals such as buffalo, cow, etc. of households. The sub-project construction does not interrupt the migration cycle of animals. There are no nomads or semi-nomads in the project site.

9. Is the sub-project unprecedented?
   Unprecedented at national level? ✓ A lot of similar projects have been implemented.
   Unprecedented at provincial level? ✓ Many reservoirs with capacity of over 1 million m³ in Lam Dong province have been upgraded and repaired.

10. Is the sub-project controversial and able to attract attention of NGOs and national or international social organizations?
   Considered risky or likely to have special controversial aspects. ✓ As repairing sub-project, it has been operated for a long time with specific management unit and target of service. Therefore, it is not possible to have special controversial aspects.
   Possible to result in objections of those who want to show or prevent the construction. ✓ The consulting results show that government and residents are 100% agree and support the sub-project implementation.

The list of environmental and social impacts of the sub-project is as follows:

### Table A4-2: Potential Environmental and Social Impacts to be Solved

<table>
<thead>
<tr>
<th>No.</th>
<th>Will the sub-project have following environmental impacts?</th>
<th>Yes</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Unknown</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Violation of historical/cultural area.</td>
<td>✓</td>
<td></td>
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<td>2.</td>
<td>Violation of ecosystem (for example: sensitive natural living environment or reserve, national park, natural reserve, etc.)</td>
<td>✓</td>
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<tr>
<td>3.</td>
<td>Distort landscape and increase waste amount.</td>
<td>✓</td>
<td></td>
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</tr>
</tbody>
</table>

There are no historical/cultural vestiges in area or the project site.
The sub-project only renovates the actual state; it does not expand or violates the natural reserve, etc. Furthermore, within a radius of 20km from Da The reservoir, there are no sensitive natural reserve or natural living environment. Therefore, the sub-project activities will not violate the ecosystem.

During the construction, the sub-project will temporarily recover 1ha hill land managed by People’s Committee of My Duc commune located on the right abutment as banking material field. The project does not cause immigration and re-settlement. There are 3 sources of solid water discharged from the construction, including: (i) construction waste such as...
<table>
<thead>
<tr>
<th>No.</th>
<th>Will the sub-project have following environmental impacts?</th>
<th>Yes</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Unknown</th>
<th>Comments</th>
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<tbody>
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<tr>
<td>4.</td>
<td>Break down vegetational cover or cut down trees.</td>
<td>✓</td>
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<td>5.</td>
<td>Short-term change in quality or flow (for example, increased water turbidity due to waste from sheds and erosion, construction waste).</td>
<td>✓</td>
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</tbody>
</table>

debris from elevating surface (plants, animal droppings, fencing walls, etc.), cement bags, oil tanks, etc.; (ii) domestic waste from worker sheds in the construction site; and (iii) remanent excavated soil. In addition, waste mud from water closet may contain harmful bacteria and is source of pollution that should be treated during the construction. So, all impacts identified above are assessed to be LOW and TEMPORARY.

The sub-project is constructed based on the project actual state; therefore, no vegetational cover is broken down or damaged. Only unoccupied area, about 1,000m² managed by the commune is used as worker shed, management house for the sub-project. However, this site has not vegetational cover.

At high peak, there may be 150 workers on the construction site, amount 8,100 liters of wastewater is discharged every day (On average a worker uses 60 liters/day, 90% of waste discharged). Domestic wastewater flowing into water resources will increase content of pollutants in water, causing water pollution. 20 vehicles of different types operate regularly on the construction site. Average amount of oil used for exchange is 18 liters/vehicle, 2 times/vehicle/year on average (real construction time). With about 20 vehicles, about 2,160 liters waste oil is discharged during the construction period. Oil overflow from construction devices or machinery cleaning water may cause pollution and reduce quality of water resources and aquatic ecosystems. Waste water and petroleum compounds may be absorbed into ground and will gradually permeated into underground water fielding stratum and cause pollution of water fielding stratum. In addition, waste water from water-closet of worker shed, if not applied properly, may also change the quality of water resources in surrounding area.
<table>
<thead>
<tr>
<th>No.</th>
<th>Will the sub-project have following environmental impacts?</th>
<th>Yes</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Unknown</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
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<td></td>
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<tr>
<td>6.</td>
<td>Increase cloudiness or pollutants in the atmosphere during the construction.</td>
<td>✓</td>
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<tr>
<td>7.</td>
<td>Increasing noise/vibration</td>
<td>✓</td>
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</tbody>
</table>

However, this impact is SMALL and TEMPORARY.

While repairing and upgrading the reservoir project items, some activities will have negative impacts such as dust and exhaust emission, affecting the life of local people:
- Operation of devices and trucks on road;
- Transportation of construction materials;
- Every day during construction time about 15 trucks on road.
Dust and exhaust may cause respiratory diseases or pulmonary diseases for the residents (such as sinusitis, asthma, etc.) if they directly contact pollution sources for a long time. However, this impact is SMALL and TEMPORARY for following reasons:
- The construction site of the sub-project is a large mountainous area. Dust may be easily diluted in the atmosphere and blown in the wind.
- The construction site of the sub-project (dam and its subsidiary works) is mainly in hamlet 8, My Duc commune. This is thinly-populated area. Only a few households living near the construction site.
- The road for construction material transportation is through the thinly-populated area, so this impact is assessed to be small.
- The number of vehicles/construction devices do not cause much noise, so when going through the resident area, they will not emit a large amount of exhaust.

Noise may be made by vehicles transporting construction materials and construction devices (excavator, earthmover, roadroller, compressor) which may affect the residents living along the road in Da Teh area. However, this impact is SMALL and TEMPORARY for following reasons:
<table>
<thead>
<tr>
<th>No.</th>
<th>Will the sub-project have following environmental impacts?</th>
<th>Yes</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Unknown</th>
<th>Comments</th>
</tr>
</thead>
</table>
|     | - The sub-project site is quite open, clear with lots of plants and fruit trees, which may reduce noise.  
|     | - The resident area is located near the road and the construction work is allocated thinly with low population density.  
|     | - The number of construction devices/vehicles making big noise is not significant. |
| 8.  | Resettle households? If yes, how many households?         | ✓   |     |        |      |         | The sub-project does not move or re-settle households, or affect building land, production land as well as assets of any households. |
| 9.  | Use environmentally / culturally sensitive resettlement area. | ✓   |     |        |      |         | The sub-project is not located in environmentally or culturally sensitive area. |
| 10. | Risks of disease transmission from workers to local people (and vice versa). | ✓   |     |        |      |         | Temporary presence of workers living in households or shes and exchange with local people may cause infectious diseases from workers to local people and vice versa. During the construction, use of water resources that do not meet hygiene standards for workers in shes or construction sites may also cause gastric, intestine diseases or spread of infectious insects (that is hermorrgahic fever, marsh fever, etc.) when immigrant workers catch diseases due to insect (mosquito) bite, and then transmit to othrs. In addition, some social diseases such as HIV/AIDS, syphilis, etc. are possible. |
| 11. | Potential conflicts between workers and local people (and vice versa). | ✓   |     |        |      |         | During the construction, about 150 technical workers from other provinces live and work in the local area. During this period, there may be conflicts between local people and workers from other areas due to differences in culture or communication or job competition. However, these impacts are SMALL and TEMPORARY for following reasons:  
<p>|     | i) According to the state regulations, contractors will have to declare temporary residence and absence to My Duc commune government of all workers to their living and working area during the project implementation. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Will the sub-project have following environmental impacts?</th>
<th>Yes</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Unknown</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>Use explosives and harmful chemicals.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ii) Immigrant workers will be disseminated and instructed by contractor about communication, information with local government and local people. In addition, contractors have regulations in worker management. iii) A number of workers (about 30%) can rent house in local area in order to carry out simple jobs such as excavating soil, eradicating, carrying construction materials.</td>
</tr>
<tr>
<td>13.</td>
<td>Use the sites where accidents of mine blast or blast of remaining materials since the war.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The sub-project does not use the sites where bomb or mine accidents have happened. Some material gathering locations and worker sheds are unoccupied and safe for local government and local people to introduce and allow. In the areas where excavation is carried out, bomb and mine will be disarmed in order to ensure safety in construction.</td>
</tr>
<tr>
<td>14.</td>
<td>The construction may cause disorder of transportation, roadway or waterway.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The construction may have impacts on travelling, local traffic will be in risk of accidents: a) increasing risks of accidents due to increasing vehicles across inter-commune road and construction site (where excavating, gathering construction devices, waste on or on roadside, project, etc.) may cause danger, especially at night when vision is limited; floating dust will limit vision; b) the construction of dams and subsidiary projects such as management road will limit local people’s travel as well as receive social infrastructure such as school, market, etc. However, this impact is SMALL and TEMPORARY for following reasons: i) Output of site vehicles is divided; ii) Amount of construction vehicles/devices travelling on road during peak hour is not significant’ iii) A part of scope of contractor work must secure health and safety on the construction site for individuals and the construction site is not permitted to let risks happen to safety of local</td>
</tr>
<tr>
<td>No.</td>
<td>Will the sub-project have following environmental impacts?</td>
<td>Yes</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Unknown</td>
<td>Comments</td>
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</tr>
<tr>
<td>15</td>
<td>Will the construction cause any damage to other existing roadway, bridge or rural infrastructure of the local area?</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The transportation of construction materials or wastes on rural roads may damage roads if these trucks are overloaded and operate in rainy season. Other rural infrastructure works such as canal route, electric cable system, information cable are not affected by the sub-project construction because these works are located on the safety corridor of the main route. On the management road, there is not electrical cable or information cable works. Social infrastructure in the local area is not affected by the construction. The main canal route of Da The irrigational system along the road maybe affected by materials spilled from trucks during the transportation or big loading capacity trucks. These impacts and LOW and TEMPORARY for following reasons: (i) Most projects are constructed in dry season so trucks transporting materials have few impacts on road quality; (ii) Amount of construction materials and trucks transporting materials is small during peak times; iii) Regulations load as well as speed of vehicles is regulated in order to make sure that damages to infrastructure will not happen.</td>
</tr>
<tr>
<td>16</td>
<td>Will excavation during the sub-project construction cause soil erosion?</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The construction of dam may cause erosion of dam body or surrounding positions. However, these impacts are LOW and TEMPORARY because dam faces are constructed in dry season. All construction positions are above lake water level and dam foot is built by cement, making it difficult for soil erosion.</td>
</tr>
<tr>
<td>17</td>
<td>Is it necessary to open new service road in the short-term and in the long-term?</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>It is not necessary to open new and temporary service road because existing routes are still capable of transporting construction materials or waste.</td>
</tr>
<tr>
<td>No.</td>
<td>Will the sub-project have following environmental impacts?</td>
<td>Yes</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Unknown</td>
<td>Comments</td>
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<tr>
<td>-----</td>
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</tr>
<tr>
<td>18.</td>
<td>Separate or break up living environment of animals, plants?</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+ The fauna and flora system under the reservoir will not be affected because the project does not have impacts on water quality or water level. + For terrestrial fauna and flora system: Around the sub-project site and the indirectly affected sites, there are no positions which are currently living environment of animals and plants.</td>
</tr>
<tr>
<td>19.</td>
<td>Long-term impacts on air quality.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sources of air pollution are mainly dust discharged from vehicles transporting construction materials and waste, etc. on the route in My Duc commune. In addition, air is polluted by construction machines, means of transportation. However, these sources are few and only appear in certain times. Therefore, there are no long-term impacts on air quality. Only some temporary impacts.</td>
</tr>
<tr>
<td>20.</td>
<td>Risks of accidents for workers and the community during the construction.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The construction may cause risks of accidents due to machinery operation, excavation, aggradation or material transportation if workers do not strictly conform to the regulations on labor safety. In addition, the construction may cause labor accidents for the community if people are not restricted to enter the site. However, this impact is MEDIUM and TEMPORARY for following reasons: i) Amount of construction machines are not many; ii) Many works will be constructed manually such as carrying materials, pouring concrete, etc. Therefore, risks of accidents will reduce; iii) The construction is mostly carried out in dry season; therefore, accidents are limited; iv) Construction sites are far away from resident areas, distance from the nearest resident area is over 500.</td>
</tr>
<tr>
<td>21.</td>
<td>Use harmful or dangerous materials and generate harmful waste.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The sub-project does not use or generate harmful substances. During the construction, a small amount of machine oil may leak into environment.</td>
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<td>Will the sub-project have following environmental impacts?</td>
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<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Unknown</td>
<td>Comments</td>
</tr>
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<td>-----</td>
<td>-----------------------------------------------------------</td>
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</tr>
<tr>
<td>22.</td>
<td>Risks to safety and people’s health.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Impacts on domestic water supply and production during the construction of project items.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Increase flood, transportation of sand in downstream area.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
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**Will the sub-project require land recovery or limitation of access to resources?**

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<tr>
<th>No.</th>
<th>Recovery (temporarily or permanently) public land (public or private) for construction.</th>
<th>✓</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>25.</td>
<td>Use land currently seized or regularly used for production purpose (for example: gardening, farming, grazing, fishing, forest).</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>26.</td>
<td>Move individuals, families or business activities.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>27.</td>
<td>Temporarily or permanently loose fruit trees, farm produce trees or housing infrastructure.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>Limit local people’s access to reserve parks and reserves.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Groups of ethnic minority live within</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Will the sub-project have impacts on ethnic minority?**

| No. | In the sub-project site, very few ethnic people live. In the sub-project site, 91.2% |

During the construction, there may be risks of labor safety, respiratory diseases due to pollution, exhaust, dust, etc.

Total estimated construction time is 24 months, most of which are upgrading earth damming system in dry season. The construction of drain, overflow and dam will not affect the water intake for production.

Da The reservoir is an independent reservoir, the reservoir downstream is watering area. The construction will need water discharge unit dead water level; however, in dry season, water in the reservoir is not much. In addition, the site has a good drainage system, so this impact is assessed to be LOW and TEMPORARY.

During the construction, the sub-project will temporarily recover 1ha of hill land located in the right abutment. This site is managed by People’s Committee of My Duc commune. The project owner has finished compensation in 2010.

1ha of production forestland at the right abutment is managed by People’s Committee of My Duc commune is seized temporarily as banking material field during the sub-project construction.

The sub-project does not cause emigration and re-settlement.

The sub-project does not affect farm produces, fruit trees or building infrastructure.

The sub-project site does not have reserve parks, hence no impacts.
<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Yes</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Unknown</th>
<th>Comments</th>
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<tbody>
<tr>
<td></td>
<td>Will the sub-project have following environmental impacts?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>are Kinh people, 8.3% are Chau Ma people and 0.5% are ethnic minorities living dispersedly and alternately with Kinh people/ Therefore, the sub-project has not influence on partial ethnic minorities.</td>
</tr>
<tr>
<td></td>
<td>or near the sub-project.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ethnicty minorities in My Duc commune and others in the commune are beneficiaries of the sub-project.</td>
</tr>
<tr>
<td>31</td>
<td>Members of ethnic minority groups in the area are likely to be beneficiaries or hurt by the project.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Will the sub-project require for construction or dependence on a dam?</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>32</td>
<td>Related to the construction of a big dam?</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Da The reservoir has the lowest dam of 15m (28m), so it is a big dam as defined by WB.</td>
</tr>
<tr>
<td>33</td>
<td>Depend on water supplied from an existing is being constructed dam or retaining dam?</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>There is no dammed lake in the upstream of Da The reservoir.</td>
</tr>
</tbody>
</table>
Appendix A5: Diagram of sampling and monitoring environment
Appendix A6: Analysis results of environmental samples
### Kết quả thử nghiệm

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<td>CH</td>
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<td>7.02</td>
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<td>3.2</td>
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<td>2.0</td>
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### Tham khảo

- QCVN 06:2006/BTNMT
- Quảng Ninh, ngày 16 tháng 12 năm 2015
- TS. Dương Thị Lục

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Sub-Project: Rehabilitation and Upgrading of Da Teh Reservoir
Appendix A7: Public consultation minutes

COMMUNITY CONSULTATION IN DA TEH DISTRICT
Appendix A8: Pictures of current status of subproject area

DA TEH DAM

SPILLWAY OF DA TEH RESERVOIR

DOWNSTREAM OF DA TEH RESERVOIR

DOWNSTREAM OF DA TEH SPILLWAY
Appendix A.9: Bid Specification - General Construction Management and Contractors’ Responsibilities (Environmental Code of Practice-ECoP)

Construction Camp Management Plan

Workforce and Camps: General Requirements

The Contractor shall, wherever possible, locally recruit the available workforce and shall provide appropriate training as necessary. The Contractor shall consider all aspects of workforce management and address potential ethnic tensions between workers and the local communities, increased risk of prostitution and communicable diseases, theft, drug and alcohol abuse, market distortion due to temporary inputs to local economy and other local tensions such as unemployment, ethnicity and divergent cultural values.

The following general measures shall be considered for construction camps:

1. The construction camp site will have to be approved by the local authority.
2. The Contractor shall present the design of the camps including details of all buildings, facilities and services for approval no later than two months prior to commencement of any construction work. Approvals and permits shall be obtained in accordance with applicable laws, applicable standards and environmental requirements for the building and infrastructure work for each camp area.
3. The Contractor shall provide adequate and suitable facilities for washing clothes and utensils for the use of contract labor employed therein.
4. Camp site selection and access roads shall be located so as to avoid clearing of major trees and vegetation as feasible, and to avoid aquatic habitats.
5. Camp areas shall be located to allow effective natural drainage and landscaped so as to avoid erosion.
6. The Contractor shall provide suitable, safe and comfortable accommodation for the workforce.
7. The Contractor shall provide adequate lavatory facilities (toilets and washing areas) for the number of workers expected on site, plus visitors. Toilet facilities should also be provided with adequate supplies of clean or potable water, soap, and toilet paper. Separate and adequate bathing facilities shall be provided for the use of male and female workers. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic conditions at all times.
8. The Contractor shall implement effective sediment and erosion control measures during construction and operation of the construction work camps in accordance with the environmental requirements as stipulated by the ESMP, especially near rivers.
9. The Contractor shall provide recreational facilities to the workforce. Such facilities will help to mitigate against potential conflict and impact on the local population as the incentive to go outside the camp will be reduced.
10. The Contractor shall provide safe potable water for food preparation, drinking and bathing.
11. The Contractor shall install and maintain a temporary septic tank system for any residential labor camp, without causing pollution of nearby watercourses. Wastewater should not be disposed into any water bodies without treatment, in accordance to applicable Vietnamese standards.
12. The Contractor shall establish a method and system for temporary storage and disposal or recycling of all solid wastes generated by the labor camp and/or base camp.
13. The Contractor shall not allow the use of fuel wood for cooking or heating in any labor camp or base camp and provide alternate facilities using other fuels.
14. The Contractor shall ensure that site offices, depots, and workshops are located in appropriate areas as approved by the appropriate Dam Safety Project environmental officer or the Supervisory Engineer;

15. The Contractor shall ensure that storage areas for diesel fuel and lubricants are not located within 100 meters of watercourses, and are operated so that no pollutants enter watercourses, either overland or through groundwater seepage, especially during periods of rain. A ditch shall be constructed around the area with an approved settling pond/oil trap at the outlet.

16. Areas for the storage of fuel or lubricants and for a maintenance workshop shall be fenced and have a compacted/impervious floor to prevent the escape of accidental spillage of fuel and/or lubricants from the site. Surface water drainage from fenced areas shall be discharged through purpose designed and constructed oil traps. Empty fuel or oil drums may not be stored on site. Waste lubricants shall be recycled, and not disposed to land or adjacent water bodies.

17. The Contractor shall ensure that site offices, depots, and workshops are located in appropriate areas as agreed by local authorities and approved by the Dam Safety Project or supervisory engineer. They shall not be located within 200 meters of existing residential settlements.

18. Concrete batching plants shall not be located within 500 m of any residence, community or work place.

19. The Contractor shall provide medical and first aid facilities at each camp area; and

20. All medical related waste shall be disposed off in proper containers, or dealt with accordingly with established procedures for safe disposal.

**Security**

Security measures shall be put into place to ensure the safe and secure running of the camp and its residents. As a minimum, these security measures should include:

1. Access to the camp shall be limited to the residing workforce, construction camp employees, and those visiting personnel on business purposes.
2. Prior approval from the construction camp manager shall be required for visitor access to the construction camp.
3. Adequate, day-time night-time lighting shall be provided.
4. A perimeter security fence at least 2m in height shall be constructed from appropriate materials; and
5. Provision and installation in all buildings of firefighting equipment and portable fire extinguishers.

**Maintenance of Camp Facilities**

The following measures shall be implemented to ensure that the construction camp and its facilities will be organized and maintained to acceptable and appropriate standards:

1. A designated camp cafeteria shall be established under strict sanitary and hygiene conditions
2. Designated meal times shall be established
3. Cooking or preparation of food shall be prohibited in accommodation quarters
4. Designated rest times shall be established
5. Designated recreational hours shall be put in place
6. Smoking shall be prohibited in the workplace
7. Procedures shall be implemented to maintain the condition of the construction camp and
facilities and ensure adequate cleanliness and hygiene
8. The latrines and urinals shall be adequately lighted and shall be maintained in a clean sanitary condition at all times
9. Water shall be provided in or near the latrines and urinals by storage in drums; and
10. A complaint register to receive and respond to complaints from the construction camp residents regarding facilities and services provided.

Code of Conduct

A major concern during a construction of a project is the potentially negative impacts of the workforce interactions with the local communities. For that reason, a Code of Conduct shall be established to outline the importance of appropriate behavior, drug and alcohol abuse, and compliance with relevant laws and regulations. Each employee shall be informed of The Code of Conduct and bound by it while in the employment of the Client or its Contractors. The Code of Conduct shall be available to local communities at the project information centers or other place easily accessible to the communities. The Code of Conduct shall address the following measures (but not limited to them):

1. All workers and subcontractors shall abide by the laws and regulations of Vietnam
2. Illegal substances, weapons and firearms shall be prohibited
3. Pornographic material and gambling shall be prohibited
4. Fighting (physical or verbal) shall be prohibited
5. Workers shall not be allowed to hunt, fish or trade in wild animals
6. No consumption of bush meat shall be allowed in camp
7. No pets shall be allowed in camp
8. Creating nuisances and disturbances in or near communities shall be prohibited
9. Disrespecting local customs and traditions shall be prohibited
10. Smoking shall be prohibited in the workplace
11. Maintenance of appropriate standards of dress and personal hygiene shall be in effect
12. Maintenance of appropriate hygiene standards in accommodation quarters shall be set in place
13. Residing camp workforce visiting the local communities shall behave in a manner consistent with the Code of Conduct; and
14. Failure to comply with the Code of Conduct, or the rules, regulations, and procedures implemented at the construction camp will result in disciplinary actions.

Construction Impact Management Plan

In order to reduce the impact of the construction activities on local communities and the environment, the Construction Contractor shall implement the following Sub-Plans in accordance with the following stipulations:

Erosion and Sedimentation

In a mountainous region, such as the Trung Son area, the project must include measures to reduce or halt erosion and landslide problems. This might include the installation of erosion control structures, protective re-vegetation and reforestation, slope stabilization, etc.

Site activities shall be carefully managed in order to avoid site erosion and sedimentation of downstream waterways. In order to minimize negative erosion impacts in the project area, the following activities shall be carried out by the Contractor:
1. Erosion and sedimentation shall be controlled during the construction. Areas of the site not disturbed by construction activities shall be maintained in their existing state.
2. Disturb as little ground area as possible; stabilize these areas as soon as possible, control drainage through the area, and trap sediment onsite. Install erosion control barriers around perimeter of cuts, disposal pits, and roadways.
3. Slope works and earth moving/excavation shall be conducted in order to minimize exposure of the soil surface both in terms of area and duration. Temporary soil erosion control and slope protection works shall be carried out in sequence to construction.
4. Conserve topsoil with its leaf litter and organic matter, and reapply this material to local disturbed areas to promote the growth of local native vegetation.
5. Apply local, native grass seed and mulch to barren erosive soil areas or closed construction surfaces.
6. Apply erosion control measures before the rainy season begins, preferably immediately following construction. Install erosion control measures as each construction site is completed.
7. In all construction sites, install sediment control structures where needed to slow or redirect runoff and trap sediment until vegetation is re-established. Sediment control structures include windrows of slash, rock berms, sediment catchments basins, straw bales, brush fences, and silt fences.
8. Control water flow through construction sites or disturbed areas with ditches, berms, check structures, live grass barriers, and rock.
9. The ground surface at the construction site offices shall be concreted or asphalted in order to minimize soil erosion.
10. Erosion control measures shall be maintained until vegetation is successfully re-established.
11. Water shall be sprayed as needed on dirt roads, cuts, fill material and stockpiled soil to reduce wind-induced erosion and dust, and
12. Larger changes in the landscape from quarries, tunnel spoil tips, etc. should be landscaped and replanted, both to reduce erosion problems and to reduce the visual impact of construction.

Particulate Emissions and Dust

The Contractor shall propose methods and actions to control dust resulting from construction related activities, including quarry sites, crushing and concrete batching plants, earthworks including road construction, embankment and channel construction, haulage of materials and construction work camps. In particular the Contractor shall undertake the following:

1. Minimize production of dust and particulate materials at all times, to avoid impacts on surrounding communities, and especially to vulnerable people (children, elderly people).
2. Use appropriate timing for removal of vegetation to prevent large areas from becoming exposed to wind.
3. Place screens around construction areas to minimize dust proliferation, paying particular attention to areas close to local communities.
4. Spray water as needed on dirt roads, cut areas and soil stockpiles or fill material. Spraying shall be carried out in dry and windy days, at least twice a day (morning and afternoon). The frequency of spraying near local communities shall be increased as needed.
5. Pave access roads with gravel in the sections which near the communities and other
sensitive receptors to reduce generation of air-borne dust.

6. Provide an adequate ventilation system and other measures to control concentration of air pollutants within tunnels.

7. Transportation of materials by vehicles and construction of access roads shall be properly designed. For example, the access road can be constructed and paved by concrete/asphalt, or laid with small graded rocks, prior to major earthworks which may require transportation of substantial amount of materials on-site and off-site.

8. Ensure adequate maintenance of all vehicles. Construction plant/vehicles that generate serious air pollution and those which are poorly maintained shall not be allowed on site.

9. Transport of chemicals or materials such as cement, sand and lime shall be covered entirely with clean impervious material to ensure that these materials shall be contained. Overflow of material shall be avoided; and

10. The exhaust gases from construction machinery and vehicles are accepted. However, the engines shall be inspected and adjusted as required to minimize pollution levels.

Noise

To minimize noise the Contractor shall:

1. Maintain all construction-related traffic on project access roads at established speed limits.

2. Maintain all on-site vehicle speeds at or below 30 kph, or otherwise designated.

3. To the extent possible, maintain noise levels associated with all machinery and equipment at or below 90 db.

4. In sensitive areas (including residential neighborhoods, hospitals, rest homes, schools, etc.) more strict noise abatement measures may need to be implemented to prevent undesirable noise levels.

5. Apply proper measures to minimize disruptions from vibration or noise coming from construction activities.

6. Design a transportation schedule for entry of construction materials to minimize the adverse impact on residents, as well as the traffic on the existing roads. The transportation vehicles shall be required to slow down and banned from using horns when passing sensitive areas. Transportation during peak hours should be minimized.

7. The Contractor shall provide the transportation route in advance to the Engineering Supervisor.

8. Maintain the construction equipment in its best operating conditions and lowest noise levels possible.

9. Provide temporary noise barriers to minimize the noise caused by construction equipment.

10. Provide hearing protection to workers who must work with highly noisy machines such as piling, explosion, mixing, etc., for noise control and workers protection.

11. Use of properly designed silencers, mufflers, acoustically dampened panels and acoustic sheds or shields, etc. shall be made. Mufflers and other noise control devices shall be
14. Use of electric-powered equipment when applicable instead of diesel-powered or pneumatic-powered equipment.
15. Equipment known to emit strong noise intensity in one direction, shall when possible, be oriented to direct noise away from nearby sensitive receptors.
16. Machines and equipment that may be in intermittent use shall be shut down between work periods or throttled down to a minimum operation.

**Night time Construction Noise Mitigation**

Although in general, night time construction shall be banned near sensitive receptors, some construction may still occur for technical and other reasons (e.g., bridge piles required and continued around clock concrete pouring). Because night time construction, if occurring near local communities, will result in significant impacts to residents and other sensitive receptors, the following special measures shall be taken during the construction phase:

1. People living within potentially impacted areas shall be notified ahead of time of the length and noise intensity of the proposed night time construction. Residents shall be informed as to why night construction is necessary and they shall be provided with the mitigation measures that are going to be implemented to obtain their understanding. These residents shall be allowed to express their concerns, difficulties, and suggestions for noise control prior to the commencement of night time construction. These concerns shall be addressed and suggestions adopted where appropriate.
2. Concrete batching plants, generators and other stationary equipment shall be carefully placed as far away from local communities to reduce noise impacts from these machines. Where possible, municipal power supply shall be used for night time construction as diesel generators are extremely noisy and avoiding their use is the best mitigation possible.
3. Equipment with lower noise levels shall be used for concrete pouring operations, which may require 24 hour non-stop operation.
4. Temporary noise barriers shall be installed at the appropriate locations to avoid night time noise impacts, and
5. Notification boards shall be posted at all construction sites providing information about the project, as well as contact information about the site managers, environmental staff, telephone numbers and other contact information so that any affected people can have a channel to voice their concerns and suggestions.

**Blasting**

The contractor shall ensure that the following procedures are undertaken:

1. The contractor shall warn local communities and/or residents that could be disturbed by noise generating activities such as blasting well in advance and shall keep such activities to a minimum
2. In sensitive areas (including residential neighborhoods, hospitals, rest homes, schools, etc.) more strict measures may need to be implemented to prevent undesirable noise levels
3. Blasting shall not be carried out within 200 m of residences or local communities;
4. Blasting shall not be carried out under adverse weather conditions
5. Prior to a blasting event, water shall be sprayed on the surface of the blast area to increase its moisture content. Wire mesh gunny sacks and sandbags shall be used on top of the blast area at each shot to prevent flying rocks and dust
6. Before blasting is carried out, a detailed survey shall be conducted at nearby communities to evaluate the degree of impacts due to the blasting activity (e.g. possible damage to structures or infrastructure due to vibration, effects on animals, local residents, etc.)

7. No blasting shall be allowed during night time unless prior approval is obtained from the government authority and the PEO.

8. All persons shall be at least 200m away from the blasting point.

9. Except for blasting equipment all electricity shall be turned off within 50m of the blasting location prior to and during the blast; and

10. The quantity of blasting materials shall be managed in a secure manner and audited weekly.

**Earthworks, Cut and Fill Slopes**

The contractor shall ensure that the following procedures are undertaken:

1. All earthworks shall be properly controlled, especially during the rainy season.

2. The Contractor shall maintain stable cut and fill slopes at all times and cause the least possible disturbance to areas outside the prescribed limits of the works.

3. The Contractor shall complete cut and fill operations to final cross-sections at any one location as soon as possible and preferably in one continuous operation to avoid partially completed earthworks, especially during the rainy season.

4. In order to protect any cut or fill slopes from erosion, in accordance with drawings, cut off drains and toe-drains shall be provided at the top and bottom of slopes and be planted with grass or other plant cover. Cut off drains should be provided above high cuts to minimize water runoff and slope erosion.

5. Any excavated cut or unsuitable material shall be disposed of in designated disposal areas as agreed to by the Supervisory Engineer, and

6. Disposal sites should not be located where they can cause future slides, interfere with agricultural land or any other properties, or cause runoff from the landfill towards any watercourse. Drains may need to be dug within and around the landfills, as directed by the Supervisory Engineer.

**Stockpiles and Borrow Pits**

The Contractor shall prepare and overall Stockpiles and Borrow Pits Management Plan for the total works. Operation of a new borrowing area, on land, in a river, or in an existing area, shall be subject to prior approval of the Environmental Supervisor, and the operation shall cease if so instructed by the Supervisory Engineer.

Borrow pits shall be prohibited where they might interfere with the natural or designed drainage patterns. River locations shall be prohibited if they might undermine or damage riverbanks, or carry too much fine material downstream. The location of crushing plants shall be subject to the approval of the Supervisory Engineer, and not be adjacent to environmentally sensitive areas, or to existing residential settlements, and shall be operated with approved fitted dust control devices. Rock or gravel taken from a river shall be far enough removed to limit the depth of material removed to one-tenth of the width of the river at any one location, and not to disrupt the river flow, or damage or undermine the riverbanks.

The Plan shall include:

1. A map showing the extent of the area to be developed.
2. A method statement defining the proposed working methods.
3. The proposed access and haulage routes between the borrow pits and the destination for the extracted materials.
4. A justification for the quantities of materials to be extracted, an estimation of the waste material to be generated and disposal details for such waste materials.
5. Details of the measures taken to minimize the borrow pit areas and their visual impact on the surrounding area, and
6. Details of the measures to be taken for the long-term rehabilitation of the borrow pit areas in order to avoid situations that could constitute a threat to health and safety and cause environmental degradation.

In general terms, the Contractor shall:

1. Identify and demarcate locations for stockpiles and borrow pits, ensuring that they are 15 meters away from critical areas such as steep slopes, erosion-prone soils, and areas that drain directly into sensitive water bodies.
2. Limit extraction of material to approved and demarcated borrow pits.
3. Stockpile topsoil when first opening the borrow pit. After all usable borrow has been removed, the previously stockpiled topsoil should be spread back over the borrow area and graded to a smooth, uniform surface, and adequately sloped for drainage. On steep slopes, benches or terraces may have to be established to help control erosion.
4. Excess overburden should be stabilized and re-vegetated. Where appropriate, organic debris and overburden should be spread over the disturbed site to promote re-vegetation. Natural re-vegetation is preferred to the best extent practicable.
5. Existing drainage channels in areas affected by the operation should be kept free of overburden.
6. Once the job is completed, all construction-generated debris should be removed from the site to an approved disposal location.
7. The Contractor shall ensure that all borrow pits used are left in an appropriate condition with stable side slopes, re-establishment of vegetation, restoration of natural water courses, avoidance of flooding of the excavated areas wherever possible so no stagnant water bodies are created which could breed mosquitoes, and
8. When the borrow pits or the local depressions created by the construction activities cannot be refilled or reasonably drained, the Contractor shall consult with the local community to determine their preference for reuse such as fish farming or other community purposes.

**Disposal of Construction Waste**

The Contractor shall carry out the following activities:

1. Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for construction debris.
2. Debris generated due to the dismantling of the existing structures shall be suitably reused, to the best extent feasible (e.g. as fill materials for embankments). The disposal of remaining debris shall be carried out only at sites identified and approved by the Supervisory Engineer. The Contractor should ensure that these sites (a) are not located within designated forest areas; (b) do not impact natural drainage courses; and (c) do not impact endangered/rare flora. Under no circumstances shall the Contractor dispose of any material in environmentally sensitive areas.
3. In the event any debris or silt from the sites is deposited on adjacent land, the Contractor shall immediately remove such, debris or silt and restore the affected area to its original
state to the satisfaction of Supervisory Engineer.

4. All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, where necessary, will be considered incidental to the work and should be planned and implemented by the contractor as approved and directed by the Supervisory Engineer.

5. Consult with local communities, if any, living close to spoil disposal sites that may be affected. The consultation shall provide local stakeholders with detailed information of the potential spoil disposal site, and provide an opportunity for them to express their opinions and concerns with the proposed plans. Information and feedback from the consultation process shall be incorporated into the final design for each spoil disposal site.

6. Include provisions for incorporating the most appropriate stabilization techniques for each disposal site.

7. Assess risk of any potential impact regarding leaching of spoil material on surface water.

8. Include an appropriate analysis to determine that the selected spoil disposal sites do not cause unwanted surface drainage, and

9. Stabilize spoil disposal sites to avoid erosion in accordance with the requirements of the Landscape and Re-vegetation Plan.

**Demolition of Existing Infrastructure**

1. The Contractor shall implement adequate measures during demolition of existing infrastructure to protect workers and public from falling debris and flying objects. Among these measures, the Contractor shall:

2. Set aside a designated and restricted waste drop or discharge zones, and/or a chute for safe movement of wastes from upper to lower levels.

3. Conduct sawing, cutting, grinding, sanding, chipping with proper guards and anchoring as applicable.

4. Maintain clear traffic ways to avoid driving of heavy equipment over loose scrap.

5. Use of temporary fall protection measures in scaffolds and out edges of elevated work surfaces, such as hand rails and toe boards to prevent materials from being dislodged.

6. Evacuate all work areas during blasting operations, and use blast mats or other means of deflection to minimize fly rock or ejection of demolition debris if work is conducted in proximity to people or structures.

7. Provide all workers with safety glasses with side shields, face shields, hard hats, and safety shoes.

**Other Management Plans**

The contractor shall be responsible for preparing the following management plans in accordance with the stipulated terms of reference:

**Waste Management Plan**

During the construction stage, the Contractor shall prepare a Waste Management Plan before commencement of project works. The Plan shall include:

**Water and Wastewater**

1. A review of the preliminary site drainage design prepared during the detailed design.

2. An update of the preliminary design based on the actual construction program and site specific conditions (e.g. the geographical conditions, location of slopes and the nature of
1. Detailed design including drawings, location maps, specifications of drainage collection channels and wastewater treatment facilities.
2. Proposed discharge locations and treatment standards.
3. A detailed implementation program of the proposed drainage system.
4. As part of the design of the site drainage system, surface runoff within the construction site shall be diverted in order to avoid flushing away soil material and the water is treated by device such as sediment trap before discharge.
5. Domestic sewage from site offices, toilets and kitchen shall either be collected by a licensed waste collector or treated by on-site treatment facilities. Discharge of treated wastewater must comply with the discharge limits according to Vietnamese legislation.
6. A wastewater treatment device such as a sediment tank can be installed near each of the constructions activities that may generate wastewater. Alternatively, sedimentation ponds can be constructed on-site to settle out excessive suspended solids (SS) before discharging into a discharge outlet.
7. Retaining walls and sandbags barriers shall be constructed surrounding the bored piling machine in order to trap bentonite and wastewater within the piling location. The collected spent bentonite or the wastewater shall be pumped for treatment before discharge.
8. Prior to the rainy season, all exposed surfaces and slopes shall be properly covered or landscaping shall be provided to minimize run-off of sediment laden. Slope protection can be carried out in sequence to construction and in advance of the rainy season.
9. Drainage control devices such as sediment traps shall be installed at each discharge outlet, and they shall be cleaned regularly, and
10. Chemical toilets can be provided on each work site employing 5 workers or more.
11. Domestic sewage collected from the site office and chemical toilets shall be cleaned up on regular basis. Only licensed waste collectors shall be employed for this disposal. The sludge shall be treated according to the requirements of the Contractor’s Waste Management Plan.

**Solid Wastes**

Wastes such as those listed below are expected due to construction activities:

1. Surplus excavated materials requiring disposal due to earth moving activities and slope cutting.
2. Disposal of used lumber for trenching works, scaffolding steel material, site hoarding, packaging materials, containers of fuel, lubricant and paint.
3. Waste generated by demolition of existing houses / buildings affected by the project or breaking of existing concrete surfaces.
4. Waste from on-site wastewater treatment facility (e.g. treatment of bentonite from tunnelling works by sedimentation process), and
5. Domestic waste generated by construction workers, construction campsite and other facilities.
6. The above wastes must be properly controlled through the implementation of the following measures:
7. Minimize the production of waste that must be treated or eliminated.
8. Identify and classify the type of waste generated. If hazardous or chemical wastes are generated, proper procedures must be taken regarding their storage, collection, transportation and disposal. (See Emergency Plan for Hazardous Materials and Chemical Waste Management Plan).
9. Identify and demarcate disposal areas clearly indicating the specific materials that can
be deposited in each, and

10. Control placement of all construction waste (including earth cuts) to approved disposal sites (>300 m from rivers, streams, lakes, or wetlands). Collect and recycle and dispose where necessary in authorized areas all of garbage, metals, used oils, and excess material generated during construction, incorporating recycling systems and the separation of materials.

The Contractor shall make a commitment to waste recycling and re-use methods in consideration of the following:

1. A method statement on waste recycling, re-use and minimization of waste generation.
2. Excavated material shall be re-used on-site or the nearby road segment / other projects as far as possible in order to minimize the quantity of material to be disposed of.
3. 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. Collected recyclable material shall be re-used for other projects or sold to waste collector for recycling, and
4. Collected waste shall be disposed of properly through a licensed waste collector.

Pollution Prevention Plan

Emergency Plan for Hazardous Materials

If the construction site is expected to have or suspected of having hazardous materials (chemicals, asbestos, hydrocarbons, or other similar hazardous materials), the Contractor will be required to prepare a Hazardous Waste Management Plan and Emergency Response Plan to be approved by the Environmental Supervisor. Removal and disposal of existing hazardous wastes in project sites should only be performed by specially trained personnel following national or provincial requirements, or internationally recognized procedures.

The Contractor shall:

1. Make the Hazardous Waste Management Plan available to all persons involved in operations and transport activities;
2. Hazardous waste (or chemical waste) shall be properly stored, handled and disposed of in accordance with the local legislative requirements. Hazardous waste shall be stored at designed location and warning signs shall be posted;
3. Inform the Environmental Supervisor, or Construction Supervisor of any accidental spill or incident in accordance with the plan;
4. Prepare a companion Emergency Response Plan outlining all procedures to be undertaken in the event of a spilled or unplanned release;
5. Initiate a remedial action following any spill or incident; and
6. Provide a report explaining the reasons for the spill or incident, remedial action taken, consequences/damage from the spill, and proposed corrective actions. The Emergency Plan for Hazardous Materials shall be subsequently updated and submitted to the PEO for no objection.

Chemical Waste
During construction there will be a potential for pollution to adjacent habitat areas and watercourses caused by chemical wastes such as spent waste oil, spent lubricant, contaminated soil material due to leakage of hydraulic oil, fuel from construction plant or vehicles, etc.

The following measures shall be put into place in order to minimize the damage caused by chemical waste:

1. All refuelling of heavy equipment and machinery shall be undertaken by a service vehicle to prevent any spillage or contamination by chemical wastes such as maintenance oils, lubricants, etc.
2. All the fuel and hazardous material storage shall be adequately enclosed to prevent any spillage problems;
3. Storm water runoff from open workshops, repair areas, and enclosed storage areas shall be collected and treated in hydrocarbon separation pits/tanks before discharge to drains and waterways.
4. All explosives shall be transported, stored and handled in accordance with applicable laws and good design engineering and constructions practices. The contractor shall provide details of proposed storage and security arrangements, and
5. Pesticides and shall be packaged, labelled, handled, stored and disposed of according to standards acceptable to the World Bank and the government of Vietnam.

**Maintenance of Construction Equipment**

The Contractor shall:

1. Identify and demarcate equipment maintenance areas (>15m from rivers, streams, lakes or wetlands). Fuel storage shall be located in proper areas and approved by the PEO.
2. Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas; never dispose spent oils on the ground, in water courses, drainage canals or in sewer systems, and
3. All spills and collected petroleum products shall be disposed of in accordance with standard environmental procedures/guidelines. Fuel storage and refilling areas shall be located at least 100m from all cross drainage structures and important water bodies or as directed by the PEO.

**Vegetation Clearing and Salvage**

**Clearing of Construction Areas**

Areas proposed for clearing shall be included in the Vegetation Clearing and Salvage Plan. Only those proposed areas shall be cleared in accordance with the Plan and approved by the Engineering Supervisor. The Vegetation Clearing and Salvage Plan shall consider the existing usage of the project land to allow its existing usage to continue as long as is practicable, without interference with the Contractor’s activities. Vegetation shall not be disturbed in those areas not submitted with the Plan.

The Contractor shall also arrange to coordinate with local communities as part of the Livelihoods Development Plan to clear the reservoir area. The following measures shall be implemented:

1. Large or significant trees in camp areas and access roads should be preserved wherever possible.
2. The application of chemicals for vegetation clearing shall be minimized. To the best extent possible, non-residual chemicals shall be selected and with negligible adverse effects on human health.
3. Herbicides use in the project shall be shown to be effective against the target vegetation species, have minimum effect on the natural environment, and be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well for personnel applying them.
4. Herbicides shall be appropriately packaged, labelled, handled, stored, disposed of, and applied according to international standards proposed by the Contractor for the project authority’s non-objection, and
5. The design of roads, including temporary and permanent access roads shall avoid crop areas where reasonable and practical.

**Landscape, Visual impacts and Re-vegetation**

The construction program of the project shall be executed in phases, particularly in those locations where severe or high landscape and visual impacts are expected.

The following measures shall be implemented:

1. Construction shall be programmed in sequence so that the scale of earth moving activities and area of exposed surface can be minimized.
2. Re-vegetation shall start at the earliest opportunity. Appropriate local species of vegetation shall be used.
3. The requirement of compensatory planting shall be included in the design and project contract. A Master Landscaping Plan and requirements of ecological monitoring or survey during different stages of the project shall be prepared during the design stage that shall be implemented during the construction and maintained during operation.
4. Facilities and structures shall be located according to the terrain and geographical features of the project site.
5. Restoration, of cleared areas such as borrow pits no longer in use, disposal areas, construction roads, construction camp areas, stockpiles areas, working platforms and any areas temporarily occupied during construction of the project works shall be accomplished using landscaping, adequate drainage and re-vegetation.
6. Existing trees and plants within the construction boundaries shall be tagged to indicate whether the trees are to be retained transplanted or removed. Transplantation of existing trees affected by the project works shall be carried out prior to the commencement of construction.
7. Excavations shall avoid damage to the root systems. Mitigation measures are also required to prevent damage to trunks and branches of trees.
8. Temporary hoarding barriers shall be of a recessive visual appearance in both color and form.
9. Upon completion of the construction, the affected areas shall be immediately restored to their original condition, including the re-creation of natural and rocky shoreline, footpath and re-establishment of disturbed vegetation.
10. At the highly visually sensitive zones, construction may be scheduled where possible at the low tourist seasons.
11. Construction trucks shall operate at night when possible and kept cleaned and covered when shipping bulk materials.
12. Construction sites shall be surrounded with fence if located at the scenery zones to avoid direct visual sights of the construction sites.
13. There shall not be construction camps in scenic areas.
Random disposal of solid waste in scenic areas shall be strictly prohibited.

All mixing stations and concrete batching plants shall not be located near rivers or in scenic areas. The stockpiles shall be located in hidden areas, and outside of the sight from tourists;

Use the existing roads as access road if possible to minimize the need for new access roads which lead to damage existing landforms and vegetation.

Land use for agricultural activity prior to use for construction activities shall be, as much as possible, restored to a state to allow the same agricultural activity to continue.

Spoil heaps and excavated slopes shall be re-profiled to stable batters, and grassed to prevent erosion.

Topsoil stripped from the work areas shall be used for landscaping works, and

Watercourses, which have been temporarily diverted by the construction activities, shall be restored to their former flow paths.

Site Restoration

At the completion of construction work, all construction camp facilities shall be dismantled and removed from the site and the whole site restored to a similar condition to that prior to the commencement of the works, or to a condition agreed to with local authorities and communities.

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

Various activities to be carried out for site restoration are:

1. The construction campsite shall be grassed and trees cut replaced with saplings of similar tree species.
2. All affected areas shall be landscaped and any necessary remedial works shall be undertaken without delay, including grassing and reforestation.
3. Water courses shall be cleared of debris and drains and culverts checked for clear flow paths.
4. All sites shall be cleaned of debris and all excess materials properly disposed.
5. Borrow pits shall be restored.
6. Oil and fuel contaminated soil shall be removed and transported and buried in waste disposal areas.
7. Saplings planted shall be handed over to the community or the land owner for further maintenance and watering, and
8. Soak pits and septic tanks shall be covered and effectively sealed off.

Safety during Construction

The Contractor’s responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all national and local safety requirements and any other measures necessary to avoid accidents, including the following:

1. Present details regarding maximum permissible vehicular speed on each section of road;
2. Establish safe sight distance in both construction areas and construction camp sites;
3. Place signs around the construction areas to facilitate traffic movement, provide
directions to various components of the works, and provide safety advice and warning. All signs shall be in English and Vietnamese language and be constructed according to Vietnamese specifications.

4. Estimate maximum concentration of traffic (number of vehicles/hour)

5. Use selected routes to the project site, as agreed with the PEO, and appropriately sized vehicles suitable to the class of roads in the area, and restrict loads to prevent damage to local roads and bridges used for transportation purposes.

6. Be held responsible for any damage caused to local roads and bridges due to the transportation of excessive loads, and shall be required to repair such damage to the approval of the PEO.

7. Not use any vehicles, either on or off road with grossly excessive, exhaust or noise emissions. In any built up areas, noise mufflers shall be installed and maintained in good condition on all motorized equipment under the control of the Contractor.

8. Maintain adequate traffic control measures throughout the duration of the Contract and such measures shall be subject to prior approval of the PEO.

9. Carefully and clearly mark pedestrian-safe access routes.

10. If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours.

11. Maintain a supply for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction.

12. Conduct safety training for construction workers prior to beginning work.

13. Provide personal protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed boots, etc.,) for construction workers and enforce their use.

14. Provide post Material Safety Data Sheets for each chemical present on the worksite.

15. Require that all workers read, or are read, all Material Safety Data Sheets. Clearly explain the risks to them and their partners, especially when pregnant or planning to start a family. Encourage workers to share the information with their physicians, when relevant.

16. Ensure that the removal of asbestos-containing materials or other toxic substances be performed and disposed of by specially trained workers.

17. During heavy rains or emergencies of any kind, suspend all work; and

18. Brace electrical and mechanical equipment to withstand seismic events during the construction.

Environmental Training for Construction Workers

During construction there will be a potential for workers to damage protected areas and waterways adjacent to camps and work areas. The Contractor shall prepare an Environmental Training Plan for all construction workers: the Plan shall address the following items:

1. All Contractors’ employees shall be required to comply with environmental protection procedures and they shall be able to provide evidence that they attended the training sessions detailed in the Plan.

2. The Plan shall educate all construction workers on the following issues but not limited to them: fire arm possession, traffic regulations, illegal logging and collection of non-timber forestry products, non-disturbance of resettlement communities, hunting and fishing restrictions, waste management, erosion control, health and safety issues, all prohibited activities, the Code of Conduct requirements and disciplinary procedures, and general information on the environment in which they will be working and living.

3. Establishment of penalties for those who violate the rules; and

4. Proposed methods for conducting the training program, which shall include formal training sessions, posters, data in newsletters, signs in construction and camp areas and
‘tool box’ meetings.

Construction Worker Health Management Plan

Health Management Plan

The Contractor shall prepare and enforce a Health Management Plan to address matters regarding the health and safety of construction workers and project staff. The Contractor shall include in his proposal the outline of the Health Plan. The Environmental Supervisor will issue a certificate of compliance to the Contractor prior to the initiation of Construction.

The following measures shall be implemented by the Contractor to ensure an adequate Project Health Program:

1. Screening of all workers on recruitment and annually
2. Implementation of a comprehensive vaccination program including but not limited to hepatitis A and B, tetanus, polio, etc.
3. Implementation of anti-malaria measures following current accepted practice at the camp area and establishment of facilities for the early diagnosis and treatment of patients with the disease
4. Storing sufficient medicines for malaria treatment
5. Collecting and testing sputum of individuals who are at risk for Tuberculosis (TB) infection
6. Storing antibiotics for treatment of respiratory infections
7. Storing medicines and transfusion fluid to treat food poisoning and diarrheal
8. Develop solutions for mass outbreaks of food poisoning
9. Periodic monitoring of public kitchen in construction camps
10. Storing and distributing vermifuges to workers
11. Implementation of a disease control and pest management measures at the time the construction camps are built
12. Distribution of free condoms to camp workers
13. Monitoring of health indicators to follow the trends
14. When buildings cannot be made mosquito proof, pyrethroid-treated nets shall be provided
15. Appropriate measures shall be taken subject to risk assessment and review of potential environmental affects to address mosquito control including dengue fever control
16. Implementation of a program for the detection and screening of sexually transmitted infections, especially with regard to HIV/AIDS, amongst labourers
17. The smaller construction camps shall have subsidiary treatment or first aid posts staffed by either a trained nurse or a locally trained personnel, as required
18. Examine and screen construction workers before employment for schistosomiasis; and
19. Selection of suitable workers from the workforce who shall receive additional training in occupational health and first aid and shall form teams of two or three personnel at each work site. They shall be under the supervision of the medical officer.

Contractors’ Environmental Supervision during Construction

The Contractor shall ensure adequate Workplace Safety and Environmental Officers (SEO$s$) are allocated and available for the implementation of the EMP throughout the construction period.
The SEOs are responsible for implementation and management of the EMP program. Regular environmental monitoring works, as required by the environmental legislation, shall be carried out by qualified laboratories and monitoring team. The laboratories and the monitoring team shall be considered members of the SEO. The roles and responsibilities of SEO and SEO are:

1. Sampling, analysis and evaluation of monitoring parameters with reference to the EMP recommendations and requirements
2. Carry out environmental site surveillance to investigate and audit the Contractors' site practice, equipment and work methodologies with respect to pollution control and adequacy of environmental mitigation implemented
3. Review the success of the EMP Implementation Plan to cost-effectively confirm the adequacy of mitigation measures implemented
4. Monitor compliance with environmental protection, pollution prevention and control measures, and contractual requirements
5. Monitor the implementation of environmental mitigation measures
6. Audit and prepare audit reports on the environmental monitoring data and site environmental conditions
7. Complaint investigation, evaluation and identification of corrective measures
8. Advice to the Contractor on environment improvement, awareness, proactive pollution prevention measures
9. Engage a qualified staff, preferably a Landscape Architect to review and monitor the Contractor’s submitted Landscape, Visual Impacts and Re-vegetation Plan, and to supervise the Contractor’s landscaping works
10. Follow the procedures in the EMP and recommend suitable mitigation measures to the Contractor in the case of non-compliance / discrepancies identified. Carry out additional monitoring works within the specified timeframe instructed by the PEO; and
11. Liaison with the Contractor and PEO on all environmental performance matters, and timely submission of EMP Implementation Plan reports to the PEO, SES, and relevant administrative authorities, if required.

Prohibitions

The following activities are prohibited on or near the project site;

1. Cutting of trees for any reason outside the approved construction area
2. Hunting, fishing, wildlife capture, or plant collection
3. Buying of wild animals for food
4. Having caged wild animals (especially birds) in camps
5. Poaching of any description
6. Explosive and chemical fishing
7. Building of fires
8. Use of unapproved toxic materials, including lead-based paints, asbestos, SEOc.
9. Disturbance to anything with architectural or historical value
10. Use of firearms (except authorized security guards)
11. Use of alcohol by workers in office hours
12. Washing cars or machinery in streams or creeks
13. Maintenance (change of oils and filters) of cars and equipment outside authorized areas
14. Driving in an unsafe manner in local roads
15. Working without proper safety equipment (including boots and helmets)
16. Creating nuisances and disturbances in or near communities
17. The use of rivers and streams for washing clothes
18. Disposing garbage in unauthorized places
19. Indiscriminate disposal of rubbish or construction wastes or rubble
20. Littering the site
21. Spillage of potential pollutants, such as petroleum products
22. Collection of firewood
23. Urinating or defecating outside the designated facilities; and
24. Burning of wastes and/or cleared vegetation.

Any construction worker, office staff, Contractor’s employees, the Client’s employees or any other person related to the project found violating these prohibitions will be subject to disciplinary actions that can range from a simple reprimand to termination of his/her employment depending on the seriousness of the violation.

Guidelines for Community Relations Plans

In addition to the RLDP (and its 3 components Resettlement Plan, Community Livelihood Improvement Plan and Ethnic Minorities Development Plan, the contractor will be required to prepare a Community Relations and Community safety Plan.

Community Relations and Community safety Plan

Community Relations

To enhance adequate community relations the Contractor shall:

1. Inform the population about construction and work schedules, interruption of services, traffic routes and provisional bus routes, blasting and demolition, as appropriate
2. Limit construction activities at night. When necessary ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures; and
3. At least five days in advance of any service interruption (including water, electricity, telephone, and bus routes) the community must be advised through postings at the project site, at bus stops, and in affected homes/businesses.

A separate Community Relation Plan for the Project will be prepared by the Contractor, which will include:

1. Means to maintain open communications between the local government and concerned communities
2. Have a the mailing list to include agencies, organization, and residents that are interest in the project
3. Provide a community relations contact from whom interested parties can receive information on site activities, project status and project implementation results
4. 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 notes and news release, when major findings become available during project phase
5. Monitor community concerns and information requirements as the project progresses
6. Respond to telephone inquiries and written correspondence in a timely and accurate manner; and
7. Modify the Community Relation Plan for changes in community needs as necessary to be accurate during different project implementation phases.
Community Safety

*Reservoir re-Filling*

The Contractor shall, with no less than 30 days prior notice, inform the Environmental Supervisor and the local authorities of any planned construction events that will raise the water level in the reservoir and that could result in stranding or drowning any inhabitants in the area.

*Traffic Safety*

The Contractor will work with local communities and community leaders to implement community traffic and safety program aimed at minimizing traffic related risks during the construction phase. The community traffic safety program will consist of the following:

1. Present the community with details regarding maximum permissible vehicular speed on each section of road
2. Establish safe sight distance in both construction areas and construction camp sites
3. Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warning. All signs shall be in English and Vietnamese language and be constructed according to Vietnamese specifications
4. Use selected routes to the project site, as agreed with the PEO, and appropriately sized vehicles suitable to the class of roads in the area, and restrict loads to prevent damage to local roads and bridges used for transportation purposes
5. Be held responsible for any damage caused to local roads and bridges due to the transportation of excessive loads, and shall be required to repair such damage
6. Not use any vehicles, either on or off road with grossly excessive, exhaust or noise emissions. In any built up areas, noise mufflers shall be installed and maintained in good condition on all motorized equipment under the control of the Contractor
7. Maintain adequate traffic control measures throughout the duration of construction
8. Carefully and clearly mark pedestrian-safe access routes
9. If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours
10. Maintain a supply for traffic signs (including paint, easel, sign material, SEOc), road marking, and guard rails to maintain pedestrian safety during construction
11. Conduct safety awareness programs in local schools and community facilities.

*Blasting*

The contractor shall ensure that blasting does not pose a risk to local residents or communities through the implementation of the following:

1. The contractor shall warn local communities and/or residents that could be disturbed by noise generating activities such as blasting well in advance and shall keep such activities to a minimum
2. In sensitive areas (including residential neighborhoods, hospitals, rest homes, schools, SEOc.) more strict measures may need to be implemented to prevent undesirable noise levels
3. Blasting shall not be carried out within 200 m of residences or local communities; and
4. Before blasting is carried out, a detailed survey shall be conducted at nearby communities to evaluate the degree of impacts due to the blasting activity (e.g. possible
damage to structures or infrastructure due to vibration, effects on animals, local residents, SEOc.).

**Worker Code of Conduct**

The Contractor shall be responsible for the preparation of a Worker Code of Conduct. This shall be made available to local communities at project information centers or other place easily accessible to the communities. The Code of Conduct shall address the following measures (but not limited to them):

1. All workers and subcontractors shall abide by the laws and regulations of Vietnamese.
2. Illegal substances, weapons and firearms shall be prohibited.
3. Pornographic material and gambling shall be prohibited.
4. Fighting (physical or verbal) shall be prohibited.
5. Workers shall not be allowed to hunt, fish or trade in wild animals.
6. No consumption of bush meat shall be allowed in camp.
7. Creating nuisances and disturbances in or near communities shall be prohibited.
8. Disrespecting local customs and traditions shall be prohibited.
9. Smoking shall be prohibited in the workplace.
10. Maintenance of appropriate standards of dress and personal hygiene shall be in effect.
11. Maintenance of appropriate hygiene standards in accommodation quarters shall be in place.
12. Residing camp workforce visiting the local communities shall behave in a manner consistent with the Code of Conduct; and
13. Failure to comply with the Code of Conduct, or the rules, regulations, and procedures implemented at the construction camp will result in disciplinary actions.

**Chance Find Procedures**

The project works could impact sites of social, sacred, religious, or heritage value. “Chance find” procedures would apply when those sites are identified during the design phase or during the actual construction period.

Cultural property includes monuments, structures, works of art, or sites of significant points of view, and are defined as sites and structures having archaeological, historical, architectural, or religious significance, and natural sites with cultural values. This includes cemeteries, graveyards and graves.

In the event of finding of properties of cultural value during construction, the following procedures for identification, protection from theft, and treatment of discovered artifacts should be followed and included in standard bidding document:

- Immediately 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.
- Notify the supervisory Engineer who in turn will notify the responsible local authorities.
- Responsible local authorities and the relevant Ministry would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures.
- Decisions on how to handle the finding shall be taken by the responsible authorities and the relevant Ministry. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance), conservation, restoration and salvage.
- Implementation of the authority decision concerning the management of the finding shall be communicated in writing by the relevant Ministry of Cultural, Sport and tourist.
• Construction work could resume only after permission is given from the responsible local authorities and the relevant Ministry concerning safeguard of the heritage.
• The World Bank needs to be notified by PMU on the issues and actions taken.
• These procedures must be referred to as standard provisions in construction contracts. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered.
• Relevant findings will be recorded in World Bank Supervision Reports and the overall effectiveness of the project’s cultural property mitigation, management, and activities will be assessed.

Appendix A.10 Integrated Pest Management Guidelines

1. General

The project is not intended to purchase or promote the use of fertilizers or pesticides. However, rehabilitation of dam is expected to increase the agricultural command areas. There is possibility that as indirect or induced impact of the project, use of fertilizers or pesticides may be increased in the project area. As a ‘good practice’, the project will promote the Integrated Pest Management (IPM) in the project area.

2. Objectives
a, General objectives

Strengthening flora protection at local level, reducing pesticide use in the field, improving the efficiency of prevention, managing well pesticide and pesticide use process to reduce the risk of contamination pesticides on the environment and affect human health.

b, Specific objectives

- Support of the relevant agencies in project provinces in strengthening pest management and pesticide management in accordance with the national action plan on food hygiene and safety, food security, adaptation to climate change and the concerned international conventions that the Government has approved.
- Strengthening environmental protection, food safety through strengthening the role of predators; reduce pesticide residues to ensure food hygiene and safety, reduce environmental pollution (water, land, air).
- Improving farmers' knowledge: distinguish the major pests, secondary; identify predators and their role in the field, clearly understand the effect of two colors of pesticides, property use, know how to survey pest and use threshold control; understand and apply pest control measures in IPM to increase income for farmers.

3. Basic principles of IPM framework

The following principles will be applied to the sub-projects:

"Prohibited list": The project will not finance the purchase of fertilizers or pesticides.

a. IPM program and project support: support and implementation of IPM program is part of the ESMP for the sub-project. Support project will include technical assistance (consulting) to perform the non-chemical options, and priority support for agricultural extension services, including additional operating costs. The bank support fee for integrated prevention program of the sub-project and will be required or approved an independent program or as a part of ESMP. A proposed budget has been allocated for the implementation of IPM programs for the downstream areas of the project area. Detailed planning work will be completed through consultation close to farmers, local authority/community organization.

b. The project will apply IPM programs as a method to minimize the potential negative impact of the increased use of fertilizers and chemicals. However, the improvement of knowledge and experience in the use of fertilizers and chemicals are through research surveys and training courses in the work as well as selecting safe use of non-chemicals, other techniques, is being investigated and/or applied in Vietnam. National IPM Program has also summarized the results of the implementation and the lessons of experience. The project will apply National IPM program results and detailed technical guidance.

c. IPM Program subproject can be set up to support the implementation of the Government's policy and objectives focusing on reducing the use of chemical fertilizers and pesticides.

d. In normal conditions, if pesticide use is considered to be a necessary option, only pesticides registered with the government and the international recognition in use and project will also provide technical and economic information for chemicals use demand. It should consider the options in the management of not harmful chemicals and can also reduce reliance on the use of pesticides. The measures will be
incorporated into the project design to reduce risks related to the handling and use of pesticides to allowed possible level and managed by users.

e. The planning and implementation of mitigation measures and other activities will be carried out closely with the authorities, powers and stakeholders, including suppliers of chemicals, to facilitate cooperation and understanding each other.

4. The approach of IPM

Focus more on the risks of abuse and excessive use chemical of plant protection products. The concerned plant are rice, vegetables, tea etc. these plants tend to be sprayed more of pesticides. Focus on community education, the initial survey will be incorporated into the task with the aim of clarifying the root cause of the abuse and excessive use of plant protection products and the associated risks. Support the capacity building of the instructor (trainer) IPM. The current program will need to be reviewed and new modules will be supplemented to increase the portion related to reducing the risk of plant protection products. The training program will be enriched with the integration of many activities such as System Rice Intensification (System Rice Intensification - SRI), minimum tillage (minimum tillage), production community and use of bio-products replacing plant protection chemicals the training activities, the application will be made in the wide area application of the model.

To perform this content, the following steps will be promoted in subproject triggering IPM:

- Step 0: Hiring consultant: IPM consultant will be hired to assist PMU/PPMU in implementing IPM programs including ensuring results and cooperation among the agencies, farmers, and other stakeholders. The task for the consultant will be implemented at an early stage of project implementation.

- Step 1: Set up the basic requirements of the register the program of farmers. This step should be implemented as soon as possible with appropriate questionnaire to establish base in 2013 for the use of fertilizers and of pesticides in the project area. Consultation with key agencies in the conduct of training, registration of participating farmers.

- Step 2: Set program goals and prepare a work plan. Based on the results from the questionnaire and consultation at Step 1, work plan and schedule will be prepared, including budgeting and implementation object. The work plan will be submitted to the PMU and approved by the World Bank for review and comment.

- Step 3: Implementation and annual review. After approval of the work plan, the activities will be implemented. Implementation progress will be included in the project progress reports. An annual evaluation report will be implemented by PMU with assistance of PPMU.

- Step 4: Evaluate the impact. An independent consultant will be hired to carry out the impact assessment. This is to assess the performance of the project and to provide lessons. PMU will hire a national consultant to perform impact assessment of IPM the program.

5. Relevant Measure at the sub-projects

IPM measures will apply on specific crops in regions and localities implement the project through the following measures:

- Cultivation methods: Soil, field sanitation, crop rotation, intercropping, crop seasons, reasonable sowing and planting density, rational use of fertilizers; appropriate caring measures.
- Using seed: the tradition seed and the proposed seed in use.
- The biological measures: taking advantage of available natural enemies in the field, using probiotics.
- Determination of the level of harm and prevention threshold.
- Chemical measures: safe using with natural enemies, the economic threshold; correct use of medicines.

**Develop of demonstration models IPM**

This section done by the PPMU, based on soil characteristics, climate, farming skills. IPM activities in the pilot field will serve for sightseeing and guidance of practice.

Some of the main contents when building the IPM in the pilot field, as follows:
- Construction of demonstration models for applying IPM measures proposed above.
- Building model involved by the people with the guidance of technical staff.
- In the model, there need to build nuclear farmers, group leader.
- In addition to technical assistance there should be support materials, for households participating in demonstration models.
- Compiling IPM guiding documentation for major crops: rice, vegetables...
- Scale of model: depending on crops, specific economic conditions, models were constructed using different scales: 5-10 ha / model.

**Coaching and training of IPM staff**

TOT (Training of trainers) and Farmer Field School (FFS):
- Relevant sub-project will organize workshops and staff training of IPM. The content of the training includes:
  - Distinguish the major and secondary pests.
  - Identify the natural enemies of pests and diseases in the field.
  - Investigate methods to detect worms and diseases.
  - Understand the impact of two pesticides, using appropriate pesticides.
  - The techniques pest control under IPM principles.
  - Advanced farming techniques.

  - The understanding must be trained in theory and practical application in the field. The contents above can be trained under thematic groups: farming thematic, identification thematic and detection methods of pests and their natural enemies, the thematic of IPM techniques in production.

**Evaluate and visit the field based on of demonstration models and field applied of IPM following the models of farmers**

Visit the coast conference, farmers performing the demonstration models are reporters. The farmers implement the model directly with the participants; visiting farmers will calculate, compare economic performance and identify lessons, limitations and the work being done and not being done.

7. Implementation of IPM programs
Currently, Vietnam is implementing the national IPM program, so sub-projects require coordinated planning and integration of the IPM program of the project with the National IPM program to perform more effectively within each sub-project.

- **PMU:**

  Developing and implementing IPM program.
  
  - To be responsible for the preparation of periodic reports on the implementation and submitting to CPO, WB. Final plan and budget will be completed and discussed with the CPO. All documents will be stored in the project file.

- **PPMU:**

  - Join coaching and staff training IPM.
  - Coordinate with IPM staff to implement coaching and trained of farmers implemented IPM through the approach and provide of knowledge, support for of farmers on the safe use of pesticides when necessary.
  - Guide the list of banned pesticides
  - Examine the distribution facility providing pesticides to ensure the provision of safe pesticides for farmers
  - Organizing for farmers decided to maintain the routine IPM was formed from a training course by organizing IMP-clubs or groups of farmers with the different levels of organization and structure, along with many activities (including the integration of the contents of cattle, credit, market access, etc.)

- **Households in the project area:**

  - Implementing IPM program has trained.
  - The members of the IPM club support together to develop agricultural activities. They also play a central role in the task of organizing community IPM program and general agricultural planning of commune and district as well.

- **Environmental Monitoring Consultant**

  - Monitoring the implementation of IPM program of sub-projects.
  - To recommend measures to improve the efficiency of implementation of IPM program of sub-projects.

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8. **Funds for implementation of IPM program**

The relevant subproject ESMP budget will have provision for IPM promotion including awareness, training, pilot demonstration and evaluation

**Additional Guidelines on IPM**

**Norms of Fertilizers for Some Major Crops**

**1. Norms of Fertilizer**

*a. For direct sowing rice:*

  - The amount of fertilizer is 1ha (8-10 tons) of manure, 250 kg Urea, 500 kg superphosphate, K chloride 150kg.
  - Whole basal fertilizing of manure, phosphate + 20% urea + 30% K.
  - Additional fertilizing tillering 60-70% urea + 20% K.
Note: The spring crop only put down fertilizer when the weather is not too cold and nitrogen fertilizer limited when rice is in ear to avoid fall in the end of the crop pests.

b. For transplanted rice

Amount of the fertilizer for 1 acres: 4-5 kg decomposed manure, urea nitrogen 8-12 kg 6-12 kg K chloride, Lam Thao superphosphate 15-25 kg. Specific fertilizer depending on the frame with rice, soil properties:

- High-yielding hybrid rice varieties grown on sandy soils, silver colored, fertilize with manure maximum.
- Domesticated rice varieties, nutrient-rich soil fertilizer with a minimum quantity.
- Sandy soil, silver colored, with mineral fertilizer ratio 1 N: 1 K2O: 1 P2O5 (1 protein: 1 K: 1 time per pure fertilizer concentration).

Boggy land, wetlands regularly, typically acidic, rich in protein, lack of time, lack of potassium fertilizer lime powder before transplanting 7-10 days and reduced nitrogen fertilizers, increasing phosphorus, K, etc.

- Recommendation on manufacturing: For initiative water soil, the total amount of fertilizer deeply lined manure, 30-40% protein + phosphate, K before transplanting harrow. None initiative water land is not nitrogen fertilizer liner to prevent cold rice death.
- The 1st additional fertilizing when rice plants have taken root in green (15-20 days after transplanting). Apply 50-80% protein 20-40% + K, water levels flooded 5cm.
- Additional fertilizing Series 2: When the rice stand, about 1-4 to 10-4 every year, 10% nitrogen fertilizer notes and other potassium. Nitrogen pay attention to the color of the leaf, if the leaf is dark green, do not apply nitrogen fertilizer to increase the amount of K, so until flowering rice, the leaves are green ginger is good, keep humidity saturated soil (soft land, subsidence feet).
- In addition to ensuring high yield and stability need to better control some pests and diseases of rice such as BPH, stem borer, sheath blight, blast, etc.

Note: only rice cultivation and nitrogen fertilizer when the outdoor temperature is greater than 15°C.

c. Hybrid maize crops:

- The amount of seed for 1 ha: 15 kg
- Organic manure: lowland areas reach at least 4-5 tons, and highland areas 3-4 tons or more.
  - Urea 300 kg
  - Phosphate 400 - 500 kg
  - Potassium fertilizer 150 kg

d. Domesticated maize crop:

- The amount of seed for 1 ha: 25 kg
- Organic manure: lowland areas reach at least 4-5 tons, and highland areas 3 tons or more.
  - Urea 200 - 250 kg
Phosphate 350 - 400 kg
Potassium fertilizer 100 - 120 kg

(If using other kind fertilizer to apply, must be taken to ensure the regularization the amount of according to 3 kinds of NPK fertilizer)

2. The requirement intensive technical guidance

a) The rice plants:

- About seed; cultivated by the new hybrid rice varieties, limit the use of the old hybrids, Steering simultaneously sowing of seasonality, monoculture on the same field, due to time of growth, leading to different characteristics difficult disease management, water control and take care.

- Regarding technical aspects
  - For rice sowing: Continue to apply the sowing areas with convenient conditions to ensure irrigation water, flat land (with accompanying technical process).
  - For rice plants: a new technique is applicable implanted moderately high density 55-60 clusters / m2, less transplant dedicated to saves Seed and time shorten the tillering, apply enough fertilizer under the guidance of technical staff.
  - Apply day intensive from Seed stage, saving seeds, apply integrated pest management (IPM), reduced plant pesticide to reduce input costs.

b) Maize crop:

- About seeds; lowland areas and upland in the uplands and upland villages of communal planting some of the maize hybrids. The area is not cultivated maize, maize buy pure, pure, high yield potential. Maize must originate clear, good quality seeds, the specialized agencies testing before supply for sowing.

- Technique: Planting density from 5.5 to 6 thousand plants / ha, only 1 tree / hole, the upland districts in density from 5 to 5.5 thousand plants / ha (1-2 plants / hole), enough organic fertilizers and inorganic fertilizers are balance, Arlier additional fertilizing as instructed.

To be suitable to each sub of the communes climate in the district. Suggest People's Committees of communes selected for the 1 to 3 seeds of rice, maize applied to the area of their communes.

Integrated Pest Management for Rice Crops
Definition, basic principles of integrated pest management

1.1. What is Integrated Pest Management (IPM)?

According to the expert group of the Food and Agriculture Organization (FAO), "Integrated Pest Management" is a pest management system that in the specific the context of the environment and the population dynamics of the species causing damage, using all the techniques and appropriate measures can be, in order to maintain the density of the pest below cause economic damage.

Abbreviation
Thus, IPM stands for Integrated Pest Management

1.2. Five basic principles of integrated pest management (IPM)

(i). Planting and health care of crops:
   - Choose good seed, suitable for local conditions.
   - Choose healthy and qualified crops.
   - Planting, cared for properly techniques to grow good crops which are resistant and high yielding.

(ii) Check fields regularly, understand the progress of the growth and development of plants, pests, weather, land, water to take timely remedial measures.

(iii) Farmers become experts field: Farmers' technical knowledge, management skills need to advocacy field for many other farmers.

(iv) Pest prevention
   - Using appropriate preventive measures, depending on the severity of disease, parasitic natural enemies in each stage.
   - Using of chemical drugs has reasonable and proper technique.

(v) Protect natural enemies: Protecting the beneficial organisms to help farmers kill pests.

2. Contents of integrated pest management

2.1. Farming methods

(i) Early land preparation and field sanitation
   - Land preparation and field sanitation soon after planting to kill many caterpillars and pupae live in the rice stem borer and rice stubble, loss of shelter and food source of the brown planthopper, green hoppers... Brokers are the transmission of viral diseases for
     - rice as dangerous illness blighted gold, rice ragged stunt disease.
   - Principles of impact of field sanitation measures and handling crop residues after harvest is cut off the ring cycle of pests from the crop to other crops and pests limited source accumulation, transmission spread at beginning of the crop.

(ii) Crop rotation: Rice rotation with other crops to avoid pathogen accumulation in rice from the crop to other crop.

(iii) Appropriate Planting
   Planting rice to ensure appropriate growth and good development, achieve high productivity, avoids the risk of the weather. The determination of appropriate the crop having to rely on the characteristics of the damage incurred pests important to ensure that rice avoiding peak of the epidemic.

(iv) Use healthy seeds, pest resistant and short seeds
   - Healthy seeds, free disease helps to rice facilitate development.
(v) Cultivation density is reasonable
- The density and sowing techniques, depending on the rice seeds transplanting, crop, soil and nutrition, aged rice, rice quality, process agricultural intensification.
- The density is too thick or too little will affect productivity, while also affecting the generation and development of pests, weeds.
- The rice fields are often sown too thick closed up early, causing high humidity, creating conditions for sheath blight and brown plant hopper damage incurred at the end of the crop.

(vi) Using reasonable fertilizers
Fertilization excessive or unreasonable fertilizer will make plants grow normally and not prone to pest infestation. Rice fields fertilization are more susceptible to infectious diseases rice blast, sheath blight, leaf blight.

2.2. Manual methods
Light traps catch butterflies, break eggs, rub stripping foil fencing using leaf spray, dig down to catch mice.

2.3. Biological methods
(i) Creating a favorable environment for beneficial organisms are natural enemies of pest development to contribute to kill pests:
- Protection of natural enemies to avoid toxic chemicals by using selective medication drugs, narrow-spectrum drugs, drugs used when absolutely necessary and should be based on economic thresholds...
- Create habitat for natural enemies after planting by intercropping, planting legumes on bunds, disintegrator for lurking natural enemies...
- Application of cultivation techniques facilitate reasonable development natural enemies.

(ii) Priority use drugs Biological Plant Protection
The medicines is effective only biological pest control, non-toxic to beneficial organisms, safe to human health and the environment

Termite Treatment Procedures

Name of chemical to be used: Metavina 10DP. This product can kill termite via directly exposure or infection. Process of survey, exploration and termite treatment and hidden risks for dam
Process of termite treatment for dam

Drill a screw and inject termiticide into termite nest, then inject clay to voids created by termites in the foundation of the dam in order to protect the surrounding environment and thoroughly handle potential dangers caused by termites. This measure does not harm the environment but it requires the construction unit to use specialized equipment and experience in construction termite treatment for irrigation works. Steps of construction termite treatment as follows:

1. Drill a screw into termite net
2. Inject termiticide
3. Inject clay to fill the void created by termite
4. Reinstate site

Requirement of protective clothes/safety for workers

For termite treatment, the potential impacts may occur such as incidents due to using construction machines in dam slope. Therefore, it is necessary to implement the requirement of protective clothes/safety for workers as follows:

i) Operating properly equipment and machine under right procedure to ensure safety.
ii) Checking current status of machines, equipment before operating. The people who are not responsible for construction, without training on technical operation are not allowed in operation, repairing construction machines.

iii) Staffs, workers must be equipped fully protective clothes such as shoes, gloves, helmet, name label etc.

iv) Power line, water for constructions have to arrange tidily to not obstruct construction activities. Construction signs must be available at construction site.

### List of Plant Protection drugs Banned in Vietnam

#### COMMON NAMES - TRADE NAMES

**Pesticides, preservatives forest**

<table>
<thead>
<tr>
<th>No.</th>
<th>COMMON NAMES</th>
<th>TRADE NAMES</th>
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<tbody>
<tr>
<td>1</td>
<td>Aldrin</td>
<td>(Aldrex, Aldrite)</td>
</tr>
<tr>
<td>2</td>
<td>BHC, Lindane</td>
<td>(Gamma - BHC, Gamma - HCH, Gamatox 15 EC, 20 EC, Lindafor, Carbadan 4/4G Sevidol 4/4G)</td>
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<tr>
<td>3</td>
<td>Cadmium compound</td>
<td>(Cd)</td>
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<tr>
<td>4</td>
<td>Chlordane</td>
<td>(Chlorotox, Octachlor, Penticlor)</td>
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<tr>
<td>5</td>
<td>DDT</td>
<td>(Neocid, Pentachlorin, Chlorophenothane)</td>
</tr>
<tr>
<td>6</td>
<td>Dieldrin</td>
<td>(Dieldrex, Dieldrite, Octalox ...)</td>
</tr>
<tr>
<td>7</td>
<td>Eldrin</td>
<td>(Hexadrin)</td>
</tr>
<tr>
<td>8</td>
<td>Heptachlor</td>
<td>(Drimex, Heptamul, Heptox)</td>
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<tr>
<td>9</td>
<td>Isobenzen</td>
<td></td>
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<tr>
<td>10</td>
<td>Isodrin</td>
<td></td>
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<tr>
<td>11</td>
<td>Lead compound</td>
<td>(Pb)</td>
</tr>
<tr>
<td>12</td>
<td>Methamidophos</td>
<td>(Dynamite 50 SC, Filitox 70 SC, Master 50 EC, 70 SC, Monitor 50 EC, 60 SC, Isometha 50 DD, 60 DD, Isosuper 70 DD, Tamaron 50 EC)</td>
</tr>
<tr>
<td>13</td>
<td>Methyl Parathion</td>
<td>(Danacap M25, M40; Foliodol - M50 EC; Isomethyl 50 ND; Metaphos 40 EC, 50 EC; (Methyl Parathion) 20 EC, 40 EC, 50 EC; Milion 50 EC; Proteon 50 EC; Romethyl 50 ND; Wolator 50 EC)</td>
</tr>
<tr>
<td>14</td>
<td>Monocrotophos</td>
<td>(Apadrin 50SL, Magic 50 SL, Nuvacron 40 SCW/DD, 50 SCW/DD, Thunder 515 DD)</td>
</tr>
<tr>
<td>15</td>
<td>Parathion Ethyl</td>
<td>(Alkexon, Orthophos, Thiophos)</td>
</tr>
<tr>
<td>16</td>
<td>Sodium Pentachlorophenate monohydrate</td>
<td>(Copas NAP 90 G, PDM 90, PBB 100 powder)</td>
</tr>
<tr>
<td>17</td>
<td>Pentachlorophenol</td>
<td>(CMM 7 liquid oil, Oil eradicate termites M-4 1.2 liquid)</td>
</tr>
<tr>
<td>18</td>
<td>Phosphamidon</td>
<td>(Dimeccron 50 SWC/DD)</td>
</tr>
<tr>
<td>19</td>
<td>Polychlorocamphene</td>
<td>(Toxaphene, Camphechlor)</td>
</tr>
<tr>
<td>20</td>
<td>Stroban</td>
<td>(Polychlorinate of camphene)</td>
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</table>

**Crops Fungicides**

<table>
<thead>
<tr>
<th>No.</th>
<th>COMMON NAMES</th>
<th>TRADE NAMES</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Arsenic compound</td>
<td>(As) except Dinasin</td>
</tr>
<tr>
<td>2</td>
<td>Captan</td>
<td>(Captane 75 WP, Merpan 75 WP)</td>
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<tr>
<td>3</td>
<td>Captafol</td>
<td>(Difolatal 80 WP, Folcid 80 WP)</td>
</tr>
<tr>
<td>4</td>
<td>Hexachlorobenzene</td>
<td>(Anticaric, HCB)</td>
</tr>
<tr>
<td>5</td>
<td>Mercury compound</td>
<td>(Hg)</td>
</tr>
<tr>
<td>6</td>
<td>Selenium compound</td>
<td>(Se)</td>
</tr>
</tbody>
</table>

**Rodenticides**
1. Talium compound (TI);
2. 2.4.5 T (Brochtox, Decamine, Veon)

Appendix A.1 UXO Guidelines

GoV Circular on UXO Handling
GUIDING THE IMPLEMENTATION OF DECISION NO. 96/2006/QD-TTg DATED MAY 04, 2006 OF THE PRIME MINISTER ON MANAGEMENT AND IMPLEMENTATION OF BOMB, MINE AND EXPLOSIVE MATERIALS

In furtherance of Decision No. 96/2006/QD-TTg dated May 04, 2006 of the Prime Minister on management and implementation of bomb, mine and explosive materials. After reaching a consensus with the Ministries and sectors concerned, the Ministry of Defense provides the guidance on implementation as follows:

I. GENERAL REGULATION

1. Scope

This Circular provides guidance on implementation of bomb, mine and explosive materials nationwide, construction investment projects using state capital (development investment capital from the state budget, state development investment credit capital, credit capital guaranteed by the state and other state investment capital) and other capital sources; projects (non-project) with foreign involvement and for the purpose of investigation, survey and research related to the existence of bomb, mine and explosive materials after war.

2. Subjects of application.

This Circular applies to the Ministries, sectors, People's Committee of provinces and centrally affiliated cities, investors, project management committees, units, businesses, national social organizations, international organizations, foreign non-governmental organizations and domestic or foreign individuals having activities related to the bomb, mine and explosive materials in the territory of Vietnam.

3. Responsibility for management and implementation organization

3.1. The duties and responsibility of the Ministry of Finance in management and implementation of bomb, mine and explosive material disposal comply with the provisions in Article 1 and 2. The duties and responsibility of the Ministries, sectors, localities and investors comply with the provisions in Article 4 of Decision No. 96/2006/QD-TTg dated May 04, 2006 of the Prime Minister.

3.2. The Ministry of Defense develops and implements the plan for investigation and survey to make a map of bomb, mine and explosive material pollution on a national scale and in detail to communal level. The Ministries, sectors, People’s Committee of provinces and cities, towns, districts and communes will coordinate with the investigation and survey force to implement and provide relevant information correctly and objectively to complete the plan. The plan result must make a map of areas still polluted with bombs, mines and explosive material in detail to communal level, assess the level of residual bombs, mines and explosive materials in each area and nationwide in service of the planning of social-economic development of the central and local governments as a basis for consultation and implementation of bomb, mine and explosive material disposal for construction works or projects.

3.3. Due to the particularly dangerous nature, the bomb, mine and explosive material disposal is implemented by the method of assigning tasks to specialized sapper units and qualified military businesses for implementation under the Decision No. 49/2007/QD-TTg dated April 11, 2007 of the Prime Minister on the special cases of appointment of contractors specified at Point dd, Clause 1, Article 101 of the Law on Construction.

3.4. The commander of units performing the bomb, mine and explosive material disposal will take the main responsibility for the result and safety for the projects and works during the construction and operation related to the issues of bomb, mine and explosive material disposal within the scope of assigned tasks.

4. Scope of activities of bomb, mine and explosive material disposal

4.1. As an item in the content of site clearance of an investment project.
4.2. As an independent project only performing a content of bomb, mine and explosive material disposal for the site clearance for general purpose.
4.3. Area, depth and safety corridor of bomb, mine and explosive material disposal for project will comply with Decision No. 95/2003/QD-BQP dated August 7, 2003 of the Minister of Defense on issuing the "Technical process of detection and disposal of bombs, mines and explosive materials" (referred to as area of bomb, mine and explosive material disposal).

4.4. The underground bomb, mine and explosive material disposal specified in this Circular is only applied in case of depth up to 15m. In case of over 15 m deep, the separate process and norm issued by the Ministry of Defense will be followed.

5. The regulations and policies on treatment, allowance and subsidy to cadres and soldiers directly involved in tasks of bomb, mine and explosive material disposal will comply with the state current regulations.

II. PROCESS OF IMPLEMENTATION OF BOMB, MINE AND EXPLOSIVE MATERIAL DISPOSAL

1. Stages of implementation

The bomb, mine and explosive material disposal is conducted in accordance with the order of implementation of basic capital construction investment projects defined by the Government including two stages:

- Preparing the estimate of bomb, mine and explosive material disposal during the stage of preparation for investment.
- Implementing the bomb, mine and explosive material disposal during the stage of project implementation.

2. Formulation of estimate of bomb, mine and explosive material disposal during the stage of preparation for investment.

The investor will, based on the area of bomb, mine and explosive material disposal for the project (specified at Point 4.3, Section 4, Part I) and the norm and unit price of bomb, mine and explosive material disposal for 1 ha of area (specified in Annex 01) of this Circular to perform the following:

- Calculation of investment capital (estimate) of item of bomb, mine and explosive material disposal of the project or for an independent project of only bomb, mine and explosive material disposal
- Aggregation of estimated capital into the total investment of project or total investment for an independent project of bomb, mine and explosive material disposal.
- Submission of project for approval.

3. Implementation of bomb, mine and explosive material disposal during the stage of project implementation

The bomb, mine and explosive material disposal during the stage of project implementation is conducted with the following steps:

3.1. Step 1: Preparing the contents of request for bomb, mine and explosive material disposal

After the investment project is approved, the investor prepares the contents of written request for bomb, mine and explosive material disposal, including:

- Project name
- Location
- Investor
- Area of bomb, mine and explosive material disposal
- Capital
- Progress requirement

3.2. Step 2: Sending the written request for bomb, mine and explosive material disposal to the following address:
- For projects with the area of bomb, mine and explosive material disposal smaller or equal to 30 ha, the written request will be sent to the High Command of Military Zone conducting the investment project for settlement.
- For projects with the area of bomb, mine and explosive material disposal smaller or larger than 30 ha, the written request will be sent to the Department of Warfare of the General Staff for settlement.

3.3. Step 3: Assigning tasks to units of bomb, mine and explosive material disposal
- Commander of Military Zone will, based on the request of the investor, pollution degree of bomb, mine and explosive materials at the area of project, decide to assign tasks to a qualified unit or business to conduct the survey and make technical performance plan – estimate and implementation of bomb, mine and explosive material disposal.

- The Head of Department of Warfare / General Staff will, based on investor’s request, pollution degree of bomb, mine and explosive material disposal at the project area, deal with the procedures and prepare decision for report to the Ministry of Defense to assign tasks to a qualified unit or business to conduct the survey and make technical performance plan – estimate; assign tasks to the performing unit. For construction projects and works with large area of bomb, mine and explosive material disposal and requirement of urgent progress, two or many units will be assigned to perform the tasks to ensure the progress.

3.4. Step 4. Assessing and approving the technical performance plan – estimate

After making the technical performance plan – estimate of bomb, mine and explosive material disposal, the assigned unit or business will send dossier to:

- Commander of Military Zone to assess and approve the technical performance plan – estimate of projects with area of bomb, mine and explosive material disposal smaller than or equal to 30 ha carried out by units or businesses under its management.

- Commander of sapper to assess and approve the technical performance plan – estimate of projects with area of bomb, mine and explosive material disposal smaller and greater than 30 ha carried out by businesses under the management of Ministry of Defense and make a report to the Ministry of Defense for approval

4. Signing of contract for implementation of bomb, mine and explosive material disposal

Based on the decision on task assignment of the Ministry of Defense or Military Zones, the investor will sign contract with the units and businesses assigned tasks for implementation, payment and finalization.

5. Performance

5.1. After the task performance contract is signed, the unit directly performing tasks must make a performance plan for report to the superior management level for approval.

5.2. The performing unit will notify in writing the bomb, mine and explosive material disposal to the local military agency in the area of project for uniform implementation and management of area.

5.3. When receiving notice, the units and agencies concerned will create conditions for the assigned unit to carry out the bomb, mine and explosive material disposal and destroy bombs, mines and explosive materials conveniently, quickly and ensure the safety and construction progress of the project.

6. Acceptance an handover

After the completion of bomb, mine and explosive material disposal for the project (or each stage), the performing unit will make a report to the investor for organization of acceptance, payment and finalization on the basis of approved technical performance plan – estimate for the investor to receive, protect and put the site into use. The dossier of result of bomb, mine and explosive material disposal is kept with project documents.

7. Inspection and report

The superior management level of the assigned unit will inspect the result of performance quality at the site. For key projects, the Ministry of Defense will assign the Command of sapper to coordinate with competent authorities for inspection organization in case of necessity.

Every quarter, 06 months or one year, the units carrying out the bomb, mine and explosive material disposal will report the result of implementation to the Command of sapper for aggregated report to the Ministry of Defense and the Prime Minister as prescribed.

III. FUND FOR BOMB, MINE AND EXPLOSIVE MATERIAL DISPOSAL

1. For projects using state budget, the compliance with the provisions in Clause 2, Article 3 of Decision No. 96/2006/QD-TTg dated May 4, 2006 of the Prime Minister is as follows:
1.1. Expenditure of allowance for the performing force with the fee of 60,000 dong/person/day under the Decision No.122/2007/QD-TTg dated July 27, 2007 of the Prime Minister on a number of benefits for servicemen and national defense workers and officials directly carrying out the bomb, mine and explosive material disposal.

1.2. Expenditure of materials, labor and machine shift is based on the estimate norm bomb, mine and explosive material disposal issued together with Decision No. 177/2007/QĐD-BQP dated July 30, 2007 of the Minister of Defense.

1.3. The equipment for performance which the army does not have and must leased from outside must be fully and correctly calculated under current regulations.

1.4. Unit price of machine shift based on the quotation of machine shift and equipment used for bomb, mine and explosive material disposal is issued together with Decision No. 177/2005/QĐ-BQP dated November 04, 2005 and No.80/2007/QĐ-BQP dated May 03, 2007 of the Minister of Defense.

1.5. Other expenditures are calculated under current regulations.

1.6. Not calculating the pre-calculated taxable incomes and other taxes (except for leased equipment).

2. For projects using other capital sources

To comply with the provisions in Clause 3, Article 3 of Decision No. 96/2006/QD-TTg dated June 04, 2006 of the Prime Minister; the unit price of bomb, mine and explosive material disposal is fully and correctly calculated under current regulations.

3. Method of fund guarantee

The fund guaranteed for bomb, mine and explosive material disposal is taken from the fund of project as an expenditure in the total investment of each project or total investment of independent project of bomb, mine and explosive material disposal. The investor will make a payment or finalize fund directly for units under contract.

IV. WORK OF BOMB, MINE AND EXPLOSIVE MATERIAL DISPOSAL FOR PROJECTS (OR NON-PROJECT) WITH FOREIGN INVOLVEMENT

1. Foreign countries, international organizations, foreign non-governmental organizations, foreign individuals or Vietnamese people living abroad and other organizations and individuals having activities to support the development, humanitarian aid in the field of bomb, mine and explosive material disposal in the territory of Vietnam and meet the requirement of the law and regulations of Vietnam are all given the favorable conditions for implementation.

The aid from foreign countries in the field of bomb, mine and explosive material disposal includes the main forms as follows:

- Aid through programs and projects.
- Non-project aid and support (aid not under the program, project; giving aid in the form of goods, materials, equipment, finance….)

The Ministry of Defense will coordinate with the Ministries, sectors and localities concerned to receive the supporting sources and remedy the consequences of bombs, mines and explosive materials in Vietnam.

2. The receipt of official development assistance (ODA) to remedy the consequences of bombs, mines and explosive materials left over from war will comply with Decree No. 131/2006/ND-CP dated November 09, 2006 of the Prime Minister issuing the Regulation on management and use of ODA.

3. The receipt of aid from the non-governmental organizations (NGO) will comply with Decision No. 64/2001/QĐ-TTgdated April 26, 2001 of the Prime Minister issuing the Regulation on management and use of aid from the non-governmental organizations (NGO).

4. The participation in the bomb, mine and explosive material disposal as the international duties assigned by the Government on the basis of international agreements in which Vietnam is contracting party.

V. IMPLEMENTATION ORGANIZATION
1. This Circular takes effect 15 days after its publication in the Gazette.

The previous regulations on management and implementation of bomb, mine and explosive material disposal in contradiction with the provisions of Decision No. 96/2006/QD-TTg of the Prime Minister and the guidelines in this Circular are invalidated.

2. For projects with the items of bomb, mine and explosive material disposal approved before the effective date of this Circular but not under the performance, their expenditure estimate will be adjusted according to this Circular. For the projects of bomb, mine and explosive material disposal still not finished, the volume completed (based on the construction diary confirmed by the investor’s supervisor) as of May 25, 2006 will be entitled to the expenditure as prescribed before the effective date of the Prime Minister’s Decision No. 96/2006/QD-TTg; the volume of performance as of May 26, 2006 to the point of time this Circular takes effect will comply with the Official Dispatch No. 5972/BQP dated November 13, 2006 of the Ministry of Defense. The volume of performance after the effective date of this Circular is adjusted under the provisions of this Circular.

3. The Ministries, sectors, People’s Committees at all levels and project investors will, based on the provisions in Decision No. 96/2006/QD-TTg of the Prime Minister and the guidelines of this Circular, organize the implementation.

Any difficulty arising during the implementation of this Circular should be promptly reported to the Ministry of Defense for consideration and settlement./.

FOR THE MINISTER
DEPUTY MINISTER
GENERAL

Nguyen Khac Nghien

ANNEX 1

UNIT PRICE NORM OF BOMB, MINE AND EXPLOSIVE MATERIAL DISPOSAL TEMPORARILY CALCULATED FOR 1HA FOR ESTIMATE OF TOTAL PROJECT INVESTMENT
(Issued with Circular No 146/2007/TT-BQP dated September 11, 200)

<table>
<thead>
<tr>
<th>No.</th>
<th>Signal density area</th>
<th>Unit price of bomb, mine and explosive material disposal for 1 ha (Million dong/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>On ground</td>
</tr>
<tr>
<td>1</td>
<td>Area 1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Area 2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Area 3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Area 4</td>
<td></td>
</tr>
</tbody>
</table>

CLASSIFICATION OF SIGNAL DENSITY AREA

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name of locality (from district, town or higher)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area 4</td>
<td>- Vietnamese – China border region (≤ 5 km from the border line to our country inland); - Thua Thien – Hue province: Huong Thuy and Phong Dien district</td>
</tr>
<tr>
<td>Area 3</td>
<td>- Nghe An province: Ky Son, Luong, Nam Dan, Nghi Loc, Hung Nguyen, Vinh City; - Ha Tinh province: all districts and towns except Thach Ha district; - Quang Binh province: all districts except Dong Hoi City; - Thua Thien Hue province: all of the remaining districts and cities.</td>
</tr>
<tr>
<td>Area 2</td>
<td>- Inner cities: Ha Noi, Hai Phong, Bac Giang, Thai Nguyen, Thanh Hoa;</td>
</tr>
</tbody>
</table>
- Nghe An province: All remaining districts and towns;
- Ha Tinh province: Thach Ha district;
- Quang Binh Province: Dong Hoi City;
- Da Nang city: all districts except Ngu Hanh Son district;
- Quang Nam province: all districts and towns except Hoi An Town and Tra My District
- Quang Ngai province: all districts and towns;
- Ninh Thuan province: all districts and towns except Ninh Hai district,
- Kon Tum province: all districts and towns;
- Dak Lak province: MaDrak, Dak RLap, Krong Bong; Buon Don districts;
- Gia Lai Province: Peiku city; IagGrai and Chu Prong districts;
- Dong Nai province: Nhon Trach district;
- Ho Chi Minh City: Cu Chi, Can Gio districts;
- Long An province: all districts except Tan An town, Can Giuoc and Thanh Hoa districts
- Binh Thuan province: Tuy Phong, Tanh Linh, Ham Tan districts;
- Binh Duong province: Ben Cat district;
- Tay Ninh province: Ben Cau, Tan Bien, Tan Chau and Tan Chau districts;
- Can Tho city: Chau Thanh, Thot Not districts
- Hau Giang province: Vi Thanh town
- Tien Giang province: Go Cong, Cho Gao, Chau Thanh districts, My Tho City, Go Cong town.
- Soc Trang province: Soc Trang City, My Tu, Long Phu, Ke Sach districts;
- Kien Giang province: Chau Thanh district;
- Ca Mau province: Ca Mau city, Tran Van Thoi, Ngoc Hien, Dam Doi, Cai Nuoc districts;
- Tra Vinh province: Tra Vinh town
- Vinh Long province: Mang Thit, Long Ho, Vung Liem districts, Vinh Long town;
- Dong Thap province: Sa Dec town; Bac Lieu province: Bac Lieu town.

Area 1  All remaining areas except localities of areas 2, 3 and 4 in the country

ANNEX 2

SURVEY EXPENDITURE ESTIMATE OF BOMB, MINE AND EXPLOSIVE MATERIALS
(Appplied to projects and works with area of 30 ha or more)
(Issued together with Circular No. 146/2007/TT-BQP dated September 11, 2007)

<table>
<thead>
<tr>
<th>No.</th>
<th>Expenditure item</th>
<th>Method of calculation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Direct expenditure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Material expenditure</td>
<td>Total material</td>
<td>VL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>expenditures</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Labor allowance expenditure</td>
<td>Total labor</td>
<td>NC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>expenditures</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Machine expenditure</td>
<td>Total machine</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>expenditures</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Other direct expenditures</td>
<td>1.5% x (VL + NC + M)</td>
<td>TT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total of direct</td>
<td>T</td>
</tr>
<tr>
<td></td>
<td></td>
<td>expenditures</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>General expenditures</td>
<td>70% x NC</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Total survey estimate cost</td>
<td>T + C</td>
<td>Z</td>
</tr>
<tr>
<td>III</td>
<td>Other expenditures</td>
<td>K1 + K2 + K...</td>
<td>K</td>
</tr>
<tr>
<td>No.</td>
<td>Expenditure item</td>
<td>Method of calculation</td>
<td>Result</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------</td>
<td>---------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td></td>
<td>Formulation of plan and report on survey result</td>
<td>5% \times Z</td>
<td>K1</td>
</tr>
<tr>
<td></td>
<td>Temporary accommodation expenditures</td>
<td>5% \times Z</td>
<td>K2</td>
</tr>
<tr>
<td></td>
<td>Assessment and approval expenditures</td>
<td>Prescribed percentage \times Z</td>
<td>K3</td>
</tr>
<tr>
<td></td>
<td>Other expenditures (if any)</td>
<td>...</td>
<td>K...</td>
</tr>
<tr>
<td></td>
<td>Total estimate value:</td>
<td>\text{Z} + K</td>
<td>G</td>
</tr>
</tbody>
</table>

Note: General expenditures and expenditure of formulation of plan and report on survey result and temporary accommodation expenditures will comply with Circular No. 14/2005/TT-BXD dated August 10, 2005 of the Ministry of Construction guiding the estimate and management of construction survey expenditures.

**ANNEX 3**

**EXPENDITURE ESTIMATE OF BOMB, MINE AND EXPLOSIVE MATERIAL DISPOSAL**

(Issued with Circular No. 146/2007/TT-BQP dated September 11, 2007)

<table>
<thead>
<tr>
<th>No.</th>
<th>Expenditure item</th>
<th>Method of calculation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Direct expenditure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Material expenditure</td>
<td>Total material expenditures \text{VL}</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Labor allowance expenditure</td>
<td>Total labor expenditures \text{NC}</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Performance expenditure</td>
<td>Total machine expenditures \text{M}</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Other direct expenditures</td>
<td>\text{1.5% \times (VL + NC + M)} \text{TT}</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total direct expenditures</td>
<td>\text{VL + NC + M + TT} \text{T}</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>General expenditures</td>
<td>\text{40% \times NC} \text{C}</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total construction estimate cost</td>
<td>\text{T + C}</td>
<td>\text{Z}</td>
</tr>
<tr>
<td>III</td>
<td>Other expenditures</td>
<td>\text{K1 + K2 + K3 + ...} \text{K}</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expenditures of survey, formulation of technical</td>
<td>Prescribed percentage \times Z</td>
<td>K1</td>
</tr>
<tr>
<td></td>
<td>performance plan - estimate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Expenditures of assessment and approval for technical</td>
<td>Prescribed percentage \times Z</td>
<td>K2</td>
</tr>
<tr>
<td></td>
<td>performance plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Camp expenditure</td>
<td>Prescribed percentage \times Z</td>
<td>K3</td>
</tr>
<tr>
<td>3</td>
<td>Expenditure of performance</td>
<td>Prescribed percentage \times Z</td>
<td>K4</td>
</tr>
<tr>
<td></td>
<td>quality inspection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Expenditure of destruction of detected bombs, mines</td>
<td>Prescribed percentage \times Z</td>
<td>K5</td>
</tr>
<tr>
<td></td>
<td>and explosive materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Expenditure of acceptance, payment and finalization</td>
<td>Prescribed percentage \times Z</td>
<td>K6</td>
</tr>
<tr>
<td>6</td>
<td>Expenditure of project or works management committee</td>
<td>Prescribed percentage \times Z</td>
<td>K7</td>
</tr>
<tr>
<td></td>
<td>(if any)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Expenditure of inspection or examination (if any)</td>
<td>Prescribed percentage \times Z</td>
<td>K8</td>
</tr>
<tr>
<td>8</td>
<td>Expenditure of management committee (if any)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expenditure of project or works management committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(if any)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expenditure of inspection or examination (if any)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expenditure of management committee (if any)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>...</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total estimate value:</td>
<td>\text{Z} + K</td>
<td>\text{G}</td>
</tr>
</tbody>
</table>

Note: General expenditure is equal to 40\% according to Circular No. 04/2005/TT-BXD dated April 01, 2005 of the Ministry of Construction.
APPENDIX B – Social

Appendix B1: Methodological note

There are many methods and techniques used in the assessment, the Consultant has applied the following methods to collect and evaluate information:
(i) Document review: The review and analysis of documents related to the Project will provide basic information of the Project and help to explain reasons for existing changes or non-existence. On the other hand, it also helps identify gaps in data need to be collected and evaluated further. The supply sources of documentation may come from Center for Investment Management and Exploitation of Water Resources Lam Dong, Department of Agriculture & Rural Development of Da Teh district, Department of Natural Resources and Environment of Lam Dong province, Division of Natural Resources and Environment of Da Teh district, Statistical Office of Da Teh district, and PC of My Duc commune and Quang Tri.

(ii) Random sample survey: to collect information from a large number of affected people through the questionnaire interview with specific questions served for statistical analysis. The survey results will provide the basis for other evaluation studies as they help collect important data about the implementation issues or specific indicators from a sample. This method requires a sampling strategy (shown as below) to evaluate criteria before and after the existence of the Project.

(iii) In-depth interviews and group discussions: to collect general information, point of views on a particular issue or clarify an issue an issue from a small group of selected people as representatives of different viewpoints and various APs (the poor, ethnic minorities, severely affected persons, ...). Group discussion is a good method to collect the opinions of changes, assessment of quality of services provided and identify fields to be improved.

(iv) Direct observation: help timely obtain information and usefully complement to the data collected, better understand the context in which the information is collected and explain the survey results.
Appendix B2: Public health intervention plan

1. **Purposes:**
   - Contractors, local authorities (Healthcare Facility) well manage risks of public health relating to sub-project implementation.
   - Raise awareness of residents, local authorities/workers in project area and help them understand potential impacts on public health during project construction.
   - Residents understand how to respond to issues relating to public health arising during construction of sub-project.
   - Residents are informed and update project construction plan to prepare plan for preventing diseases harmful to community during construction.

2. **The objects that need to be managed:**
   - Risk factors relating to disease outbreak at construction site, worker camps, dump sites and community.
   - Risk factors relating to labor unsafety, traffic, especially on the road transporting materials and waster.
   - Worker camp, especially sanitation area and cooking area of workers.
   - The compliance of workers in ensuring labor safety and disease prevention.
   - Sensitive locations/source of wasters denerating infectious diseases.

3. **The issues need to be managed:**
   - Kinds of diseases, especially infectious diseases that often occur on the project area.
   - The risks of spreading infectious diseases or affecting public health caused by employees from other places staying in locality and vice versa.
   - The risks of affecting public health due to noise and dust generated from cars, construction machines; and from dump sites or domestic waster from worker camps.
   - The risks of accident for people in construction site of the sub-project.
   - The risk of accident to community when the number of trucks for transporting construction materials increase.
   - The risks of dam safety for households in downstream area.
   - Mechanism of reporting and sharing problems relating to outbreak of epidemics or issue of safety for people in the community.

4. **Time: Before and during construction of the sub-project:**
   One month before construction, contractor shall coordinate with local authorities to announce construction plan and potential impacts relating to public health.

5. **Location:**
   - At worker camp.
   - At dump sites.
   - At construction site
   - On My Duc commune

6. **Methods of management and supervision:**
   **a. Indicators for supervision and management:**
   - Number of occupational accidents caused by sub-project construction.
   - Number of traffic accidents caused by vehicles serving sub-project construction.
   - Number of times/number of workers getting sick, especially getting infectious diseases.
   - The availability of medicine cabinet for worker in camps.
   - Number of workers who are guided/trained on issues related to public health.
   - Documentation guiding first aid and emergency/how to cope with epidemics and accidents that contractor uses and provides to workers.
b. **Management methods**

- Contractor shall assign a superintendent or a worker to be responsible for issues of labor safety and workers’ health to monitor and support relevant issues.
- Contractor coordinates with communal Healthcare Facility, village health staff to timely update epidemics situation in the localities or issues of worker’s health, diseases that may spread.
- Contractor coordinates with local authority, health station to inform on issues related to the safety of people in construction area or on the road transporting construction materials/wastes.
- Communal People’s Committee/ Healthcare Facility proactively inspect the sanitation, labor safety in construction site and workers’ camp.
- Contractor coordinates with Communal People’s Committee/ Healthcare Facility to form coordination mechanism when accidents or epidemics occur.

7. **Management, monitoring and implementation units:**

- **Lam Dong Water Resource Management and Exploitation** is responsible for general supervision of all project activities including communication plan, public health consultation plan. Issues related to public health are also contents reflected in complaint mechanism of the project.
- **Communal Authority**: Communal authority is generally responsible for all issues arising in the commune. Communal authority may assign community monitoring unit to monitor communication and consultation activities in the locality.
- **Communal Healthcare Facility**: Communal Healthcare Facility has the function of management, monitoring, first aid, reporting issues of public health in the commune. Therefore, issues relating to public health are also subject to the monitoring, supervision and support from this unit.
- **Contractor**: The superintendent on behalf of contractor coordinates with local authorities to perform communication and consultation activities relating to public health and workers’ health.

8. **Funding for implementation**

- **For contractor**: Funding source of contractor is included in construction contract.
- **For Healthcare Facility**: No fund for this activity because this is responsibility of health units in public health management work.
Appendix B3: Public consultation, Participation and communication strategy

1. Purposes:
   - Strengthen access to information in their own interests for residents in project area;
   - Residents are informed, update project construction plans to actively prepare plan for production and living;
   - Information for development: improving information access serving people’s life, raising living quality;
   - Enhance residents’ participation.

2. Objects of communication and consultation
   - People in the commune, especially in project area and villages/hamlets where vehicles transporting construction materials go through
   - Local authority, officials in villages/hamlets
   - Workers and staff at construction site.
   - For the community, encourage the participation of both men and women

3. Contents of communication and consultation
   - Contents, main items of the sub-project, implementation capital source;
   - Benefits from the sub-project;
   - Organize sub-project construction in locality: information about employer, construction contractor, performed supervisions;
   - Plan, schedule for construction of main work items;
   - Possible impacts during construction that affect local environment and society and residents in project area;
   - Resident participation mechanism, community monitoring mechanism, complaint settlement mechanism;
   - Problems discovered during project implementation: conflict, combustible materials, acts violating commitments of contractor, employer, etc.
   - Notice of local labor recruitment for construction activities.

4. Time: Before and during sub-project construction.
   One month before construction, contractor shall coordinate with local authorities to announce construction plan and potential impacts relating to public health.

5. Place:
   At project commune, with priority in sub-project construction area

6. Methods of communication and consultation
   Communication and consultation activities are performed through the following methods:
   - Communication on communal loudspeakers: Currently, My Duc commune has loudspeaker systems in all hamlets. Most of other communication activities of locality are performed through this method. Therefore, loudspeaker systems are used to notify residents in the commune of relevant issues during sub-project construction.
   - Public meeting/Public consultation: This method will be performed with the participation of officials of hamlets in the project commune, residents in Hamlet 1, sub-project construction area and households along the road for transporting construction materials or including dump site.
   - Communication integrated into operation of departments or authorities: Every month, the authority often holds meetings with communal officials and departments in the hamlet; therefore, communication contents may be integrated into these activities.

7. Executor:
   a. Before project implementation:
      Safety Policy Consultant Unit will carry out community communication, consultation on issues of general safety policy.
   b. During project implementation:
Project Management Unit, Contractor shall coordinate with local authorities and social organizations, villages/hamlets to build and implement communication activities according to methods as above.

8. **Monitor and supervise the implementation**

   Public communication and consultation plan involves in the participation of following units:
   - Project Management Unit of Lam Dong province. Project Management Unit shall be responsible for general supervision of project operations including communication and consultation plan with community’s participation. Issues on environment, society, compensation of affected property directly related to residents are also contents reflected in complaint mechanism of the project.
   - Communal authority: Communal authority is generally responsible for issues incurred in the commune. Communal authority may assign Community Monitoring Unit to monitor communication and consultation activities in the locality.
   - Contractor: The superintendent on behalf of contractor coordinates with local authorities to perform communication and consultation activities relating to public health and workers’ health.
Appendix B4: Gender action plan
From the above analyses of gender, a gender action plan is needed to facilitate the full participation of women in the project construction stage, providing new opportunities for women to boost their income, without increased burden on their lives, and contributing to the enhancement of women’s role and status in the project area. The objectives of this plan include:

(i) The local contractors will employ at least 30% of female workers in maintenance, construction and repair works;
(ii) For a similar type of work, female workers should be paid as much as male workers;
(iii) Safety conditions must be equal to both men and women;
(iv) The local contractors will not use child labor;
(v) The use of local labors is encouraged and the establishment of labor camps will be avoided;
(vi) The Women’s Group and Union will be consulted about the design of subprojects;
(vii) Training on gender mainstreaming will be provided for national, provincial and local authorities (i.e. PMUs, and other stakeholders);
(viii) Training and capacity building is provided for women to engage in public decision-making and sub-projects in a way that makes the most sense (i.e. training in participation, negotiation skills, marketing skills, mathematics and literacy);
(ix) The involvement of women in project study tours is ensured.
(x) The agricultural extension services aimed at women are designed and delivered to women;
(xi) The awareness enhancement campaign on HIV/AIDS will be launched before the start of civil works. PMU is responsible for monitoring and reporting of GAP key performance indicators, including the participation of women, target works and trainings, and HIV prevention campaigns;
(xii) At least one woman shall be involved in the Supervision Board of a commune (about 1/3 of the members).

The Project’s Gender Action Plan

<table>
<thead>
<tr>
<th>Achievements</th>
<th>Tasks and Indicators</th>
<th>People in charge</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement 1: Improvement of dam safety and irrigating conditions.</td>
<td>The contractors shall prioritize unskilled labor (through subcontracting); at least 30% of the total labor force is local unskilled ones; Among this 30% local labor, female workers shall be prioritized; Male and female labor will receive the same wages for the same type of work; The Contractors shall not employ children; Those locals wish to work for the project shall register at their villages/hamlets. Then, these registrations shall be provided by the Head PMU/Project Coordinator shall ensure the record of these terms in the Contract; the list of registered labor shall be submitted by communal officials the Contractor; Communal officials shall ensure the achievement of the targeted objectives.</td>
<td>PMU/Project Coordinator</td>
<td>During construction stage</td>
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<td>Achievements</td>
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<td>of the villages and communes to the Contractors for selection in favour of poor and vulnerable households.</td>
<td>At least 30% of women shall participate in agricultural extension courses.</td>
<td>Staff of Provincial PMU, District staff, Communal staff.</td>
<td>During construction stage</td>
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<td><strong>Achievement 2: Enhancement of people’s capacity to make advantages of the Project</strong></td>
<td>Programs on HIV/AIDS and human trafficking. Programs on community-based risk mitigation. Information about risk mitigation will be transferred to the communes and villages affected by the Project using the participatory approach with a focus on the poor and vulnerable households (e.g. ethnic groups, households headed by women, households with elderly and disabled people). The documents and information should be appropriate in terms of language, culture and gender, and especially translated into ethnic languages in the region;</td>
<td>The Provincial and Communal Women's Union shall organize and host the program (training and preparation of materials) in collaboration with the district/communal health center. The Village’s Women’s Union shall popularize and communicate information. The district/communal Health Centers shall support the communal Women’s Union. Project coordinator shall provide local and international gender experts and specialists on Ethnic Minorities. Gender experts and specialists on EM shall review existing materials and supplement the required ones for the Program.</td>
<td>Monthly, before and during construction stage</td>
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<td><strong>Achievement 3: Enhancement of awareness on potential social evils of vulnerable objects, especially women and ethnic minorities</strong></td>
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<td>Achievements</td>
<td>Tasks and Indicators</td>
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<td>chief and one member of the Women’s Union. The program will be implemented in the</td>
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<td>villages and on market-days through distribution of project/program materials and</td>
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<td>use of loudspeakers</td>
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<td></td>
<td><strong>Program on risk mitigation during project construction stage:</strong></td>
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<td>PMU and the contractor will coordinate closely with the health services in</td>
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<td>communes and districts to implement programs on awareness enhancement and</td>
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<td>education on disease prevention, diagnosis and treatment for laborers.</td>
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<td>All programs and documents are built with integration of gender issues, including</td>
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<td>vulnerability and needs of men and women.</td>
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<td>The Contractor shall:</td>
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<td>Implement awareness enhancement programs workers and communities, including</td>
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<td>education and communication on HIV infection and preventive measures.</td>
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<td>Provide free consulting services and encourage employees to do HIV tests so that</td>
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<td>they all know about their health status.</td>
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<td>Support the access to health services and encourage HIV-infected patients to admit</td>
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<td>their status;</td>
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<td>PMU The Contractor Local Health Centre Communal staff The Women’s Union shall</td>
<td>During construction stage.</td>
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<td>perform general coordination for better HIV prevention.</td>
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<td>Achievements</td>
<td>Tasks and Indicators</td>
<td>People in charge</td>
<td>Period</td>
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</tbody>
</table>
|  | Provide medical equipment (free condoms) for workers in the camps; | - Project implementation consultant  
- PPMU | During design and initial implementation stages |
| **Project Management** | Guidelines on Gender and Development and Education shall be provided for PMU staff, local agencies and Contractors. All capacity enhancement activities shall include the involvement of women and ethnic minorities. | | |
Appendix B5: Grievance Redress mechanism

Complaints relating to any matter of the Project will be settled through negotiations aimed at achieving consensus. The complaint will pass through three stages before it can be filed to the court. The Enforcement Body will incur all administrative and legal fees relating to complaint handling.

The complaints relating to the Project shall be settled in compliance with Article 138 of the Land Law 2003; Article 28 of the Law on Complaints; Article 63 and 64 of Decree No.84/2007/ND-CP; Clause 2 of Article 40 of Decree No.69/2009 and regulations on complaints in Decree No.75/2012/ND-CP dated 20/11/2012. According to Clause 2 in Article 138 of the Land Law 2003 and 2013:

(i) In case of complaints against administrative decisions and administrative actions on land management first settled by the Chairman of the People's Committees of districts, towns and cities under the province, without contentment of the complainant, the complaints can be filed to the People's Court or appealed to the Chairman of the People's Committees of provinces and centrally-run cities. In case of appeal to the Chairman of the People's Committees of provinces and cities under central authority, the decision of the Chairman of the People's Committees of provinces and cities under central authority is the final one.

(ii) In case of complaints against administrative decisions and administrative actions on land management first will be settled by the Chairman of the People's Committees of districts, towns and cities under the province, without contentment of the complainant, the complaints can be filed to the People's Court.

(iii) The time limit for complaints against administrative decisions and administrative actions on Land Management is thirty (30) days after the date of receipt of the administrative decision or being informed of that administrative decision. Within 45 days from the date of receipt of the first complaint resolution decision, the complainant, if disagree, can make an appeal to the state authority or the People's Court.

In terms of complaint settlement, in Law on Complaints, Article 14: Rights and obligations of the person competent to settle first-time complaints:

(i) The person competent to settle first-time complaints should:
   a) Ask the complainant, relevant agencies, organizations and individuals to provide information, documents and evidence within 07 days of the request as a basis for complaint settlement;
   b) Determine to employ or cancel the emergency measures as defined in Article 35 of this Law;

(ii) The person competent to settle first-time complaints should perform the following obligations:
   a) To receive the complaint and issue a notice in writing to the complainant, agencies, organizations, or individuals entitled to appeal and the state inspection agencies at the same level of acceptance of resolving complaints against administrative decisions and actions;
   b) To settle the complaints against administrative decisions and actions if required by the complainant;
   c) To open a dialogue with the complainant and agencies, organizations and individuals concerned;
   d) To decide complaint settlement and be responsible before the law for settlement results. In case of complaints from authorized agencies, organizations and individuals, the results shall be notified to agencies, organizations and individuals in accordance with law;
e) To provide information, documents and evidence relating to the complaint for the complainant when they are required by the complainant for second-time settlement or appeal to the People’s Court.

(iii) To compensate for first-time settlement and damages due to administrative decisions and actions in accordance with regulations on the State responsibilities.

(iv) The person competent to settle first-time complaints should perform their rights and obligations as stipulated by Law.

In terms of announcement of complaint settlement decision: In Article 12 of Decree No.75/2012/ND-CP dated October 3rd, 2012 of the Government detailing the implementation of some articles of the Law on Complaint.

(i) Within 15 days from the date of decision of complaint settlement, the person competent to settle the complaint for the second time shall announce the complaint settlement decision by one of the forms specified in Clause 2 in Article 41 of the Law on Complaints.

(ii) In case of announcement at a meeting, the attendees of the meeting must include: the person issuing the complaint settlement decision, the complainant or their representatives, the person subject to complaint and agencies, organizations and individuals concerned. Before conducting a public meeting, the person competent to settle complaints must send a notice to agencies, organizations and individuals involved 3 days in advance.

(iii) The announcement of complaint settlement decision shall be made on the mass media (television, radio, printed and electronic newspaper). If the agency of the person competent to settle complaints has their own portal or website, the complaint settlement decision should be made public on this portal or website. The minimum number of announcement is 02 times on radio, television, and printed publications. The period of announcement on electronic publications, portals or websites should be at least 15 days from the date of notification.

(iv) In case of notice at the office or the Reception Room of agencies and organizations competent to settle complaints, the period for the notice of complaint settlement decision to be posted up is at least 15 days.

The procedure for complaint settlement consists of 4 stages as below:

(i) **The first stage in the Communal People’s Committee**: Households affected can file their complaints to any member of the CPC, possibly through the village chief or directly to the CPC in writing. The mission of the CPC officials or village chief is informing the entire CPC the complaint. Then, the CPC will hold a private meeting with the households affected and sign the complaint decision within 10 days. The CPC secretary shall be responsible for compiling and filing documentation of all complaints handled by the CPC. The duration of first-time settlement of complaints shall not exceed 30 days from the date of signing the complaint decision; for complicated cases, this period could be extended but not exceed 45 days from the date of receipt of the complaint. In remote regions difficult for travelling, the time limit for complaint settlement is no more than 45 days from the date of acceptance; for complicated cases, this period could be extended but not exceed 60 days from the date of acceptance (according to Article 28, Law No.02/2011/QH13 dated 11/11/2011). If the complaint is not resolved for the first time or the complainant is not content with the settlement results from the date of receipt of the first-time settlement decision, they have the right to file the complaint for second time to the People's Court or the District People’s Committee.

(ii) **The second stage in the District People’s Committee**: According to Article 63 of the Decree No.84/2007/ND-CP of the Government, the procedure for complaint settlement against administrative decisions and actions of the Chairman of the District People's Committee is: (i) Within ninety (90) days from the date of issuance...
of administrative decisions and actions by the Chairman of DPC regarding land management stipulated in Article 162 of Decree No.181/2004/ND-CP that people of relevant rights and obligations disagree with, complaints can be filed to the DPC; (ii) the Chairman of the DPC shall settle the complaint within the period of 30 days from the date of signing complaint decision. In remote areas difficult for travelling, the duration for settlement is no more than 45 days from the date of acceptance; for complicated cases, this period shall be expended but not exceed 60 days from the date of acceptance; (iii) The settlement decision of the Chairman of the DPC shall be publicly available and sent to the complainant and other people of relevant rights and obligations; (iv) Within forty-five (45) days from the date of receipt of the settlement decision of the Chairman of the DPC that the complainant does not agree with, the appeal can be filed to the People's Court or the provincial People's Committee. The time limit for appeal may be longer, but not more than 60 days from the date of acceptance for complex cases. In remote areas difficult for travelling, this period is no more than 60 days from the date of acceptance, and no more than 70 days for complicated cases (according to Article 37, Law on Complaints No.2/2011/QH13 dated 11/11/2011); (v) The body accepting the complaint shall record this in the Complaint Settlement Logbook.

(iii) **The third stage in the Provincial People's Committee:** The procedure for complaint settlement against administrative decisions and actions of the Chairman of the Provincial People's Committee is (i) Within thirty (30) days (or 45 days for complicated cases) or within 45 days for remote areas (or 60 days for the complicated cases) from the date of issuance of administrative decisions and actions by the Chairman of the PPC regarding land management stipulated in Article 162 of Decree No.181/2004/ND-CP that people of relevant rights and obligations disagree with, the complaint can be filed to the PPC; (ii) The Chairman of the PPC shall settle the complaint within the time limit stipulated in Law on Complaints; (iii) The complaint settlement decision of the PPC shall be publicly available and sent to the complainant and other people of relevant rights and obligations; (iv) Within forty-five (45) days from the date of receipt of the settlement decision from the Chairman of the PPC that the complainant does not agree with, the appeal may be filed to the People's Court. The time limit for appeal may be longer but not more than 60 days from the date of acceptance for complicated cases. In remote areas difficult for travelling, this period shall not exceed 60 days from the date of acceptance, and 70 days for complicated cases; (v) the body accepting the complaint shall record this in the Complaint Settlement Diary.

The final phase, the arbitration by the Court: Within forty-five (45) days from the date of receipt of the settlement decision by the Chairman of the PPC that the complainant is not satisfied with, an appeal shall be filed to the People's Court (according to Article 64 of Decree No.84.2007/ND-CP). During the processing time, the land acquisition decision is still implemented. If the state authority handling the complaint concludes that the land acquisition is unlawful, the state agency issuing land acquisition decision shall cancel their decision and make compensation for damages (if any) caused by land acquisition decision. If the land acquisition is considered as lawful, the person being acquired land shall abide by the decision. Within 30 days from the trial date, the Council on Resettlement and Compensation shall pay the affected households the amount specified by the Court. If the land acquisition is concluded as legal by the Court, the person with acquired land shall comply with the decision (according to Article 54 of Decree No.84/2007/ND-CP).
Appendix B6: Information disclosure, accountability and monitoring

1. Consultation and announcement

The main objectives of information announcement and public consultation is to ensure the participation of affected communities, households, local governments and organizations concerned in sharing the Project information, consulting the selection of technical plans, planning impacts on land, income and assets on land... The announcement is an important contribution in accelerating the Project progress during implementation and preparation, as well as when the project is put into operation with the consensus of the community, government, and PMU. This will minimize the possibility of conflicts and other risks and increase the investment efficiency and social significance of the Project.

The public consultation and announcement should ensure:

- The local authorities as well as the representatives of the people affected shall be involved in the project planning and decision making process. The PMU shall work closely with the commune/district during the implementation of the Project. The involvement of the people affected in the implementation process shall be remained by asking the commune/district to invite the representatives of the affected people to be a part of the Council on Compensation and Resettlement as well as in resettlement activities.

- All information about the items and activities planned for the Project should be shared to the people affected.

- The demands and priorities of the affected people, as well as their responses to the proposed policies and activities, should be collected.

- The affected people should be fully informed of the decisions influencing directly their income and lives, and can be involved in activities and making decisions on issues directly affecting them.

- The transparency in all activities relating to land acquisition, compensation, resettlement and rehabilitation should be ensured.

For the World Bank, those people affected by the project should be fully informed and consulted on resettlement and compensation plans. Consultation is the starting point for all activities related to resettlement. The people affected by resettlement may be afraid that their livelihoods and community relations can be affected, or their rights can not be guaranteed. Being involved in resettlement planning and management helps to alleviate these fears and bring the affected people the opportunity to participate in decisions that affect their lives. The implementation of resettlement without consultation may lead to an inappropriate strategy and ultimate ineffectiveness. Without consultation, the affected people may have negative reactions to the project, causing social problems, significant delay or even cancellation in completion of goals, thereby increasing the costs. As a result, with consultation, the initial resistance can be translated into the constructive participation.

For Vietnam, a further key step in strengthening democracy at grass-roots level is the Directive No.30-CT/TW of the Central Committee of the Communist Party of Vietnam in "Building and implementing regulations on grassroots democracy" and the Decree No.79/2003/ND-CP also on this issue. The key point of this legislation is the famous slogan, which is "People know, people discuss, people do and people inspect." The Ordinance No.34/2007/PL-UBTVQH11 has addressed the matters that should be consulted by local governments and communities before decision-making by the authorities, including building compensation and resettlement plans relating to the project and works in the commune/ward. The Clause 2 in Article 39 of the Law on Land 2003 requires the announcement of resettlement issues such as reasons, land acquisition plans, relocation plans, overall compensation plans, and land clearance to the people affected.

Thus, consultation and participation is an innovation in the implementation of projects in Vietnam. This policy will address the shortcomings in the implementation of the projects, as
both the locals and the person in charge of project implementation are inexperienced in this field.

The following points should be noted to encourage the participation of stakeholders in the consultation process of the project:

- Identify and attract all stakeholders, especially people living in the project area and those affected (men, women, the poor, ethnic minorities...), in the process of consultation and participation;
- Develop participatory strategies for Project planning, implementation, monitoring and evaluation.
- Develop the topics and content needed for promotion and popularization campaigns, as well as negotiation procedures for the affected people on their benefits.
- Attract stakeholders in decision making at all stages of the project (e.g. design plans, compensation methods, implementation schedule, etc...).
- Establish a schedule for completion of activities such as campaigns to provide information, the extents and forms of compensation, benefits, location and relocation plan.
- Develop procedures for complaint settlement.

The public consultation should be regularly carried out for the units in charge of preparation and detailed design of the project categories. This helps to ensure the participation of communities in the proposed designs and limit the adverse impacts on the community. This also helps works to be friendlier with the community and users.

The consultation should also be performed with related parties, including the units to be in charge of management and operation of works to ensure that they are consulted and commented on the designs.

During the construction stage, the Project owner should announce promotion in mass media regarding construction activities and expected schedule, measures to support the people affected and the procedure for receipt of feedbacks from the community. The affected persons shall be informed of the Project policies and procedures to ensure no many changes in their future lives. In case of any questions about the Project, they can inform and obtain the support from the PMU.

The content and method of public consultation/announcement is as follows:

<table>
<thead>
<tr>
<th>Items</th>
<th>Method of public consultation/announcement</th>
<th>Period</th>
<th>Person in charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Detailed design drawings: Alignment alternatives</td>
<td>Meeting with the government of the ward/commune and relevant units; the representatives of the affected households.</td>
<td>Survey and design stages</td>
<td>the Consultant, PMU</td>
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<tr>
<td>• Land acquisition, clearance and compensation.</td>
<td>The ward/communal staff, together with PMU staff, shall consult with APs for initial assessments. Land acquisition and compensation plans shall be developed and discussed with APs before submission to authorities for decision. Policy announcement and explanation shall be made in meetings with APs.</td>
<td>Prior-implementation stage</td>
<td>the Communal People’s Committee, PMU</td>
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</tbody>
</table>
2. Social accountability

The announcement of the proposed plans of the Project to the affected people and stakeholders during community consultation and field survey by the social assessment consultants is to make a paradigm for continuing public information during the project implementation. Moreover, as required at all public meetings, the affected always wish for meetings to regularly exchange information with PMU at the headquarters of CPC where the community will suffer from impacts during project implementation. Therefore, reports on resettlement plans and environmental management plans should reflect the responsibility of PMU in ensuring the regular announcement of information to the public.

In addition to regular meetings between the PMU and the affected communities in CPC offices, the public meetings in all communes where public consultation has been conducted have identified the need to establish the tight connection for easy and quick contact with the PMU. The best way is to provide the phone number and address of the PMU in charge in all locations of the Project’s items and the headquarters of all the communes of the entire Project’s components.

3. Participatory supervision

In order for the project components to ensure its efficacy and necessity, it is necessary to have a monitoring plan with the participation of stakeholders such as the Department of Natural Resources and Environment, Department of Construction, Department of Planning and Investment, Department of Transport... After completion, the direct management and operation agency/unit of the project items should be involved in the design and construction processes. Together with the independent monitoring unit of the project, there should have a community-level supervision division to monitor project activities, especially activities related to resettlement, sanitation and the construction of various items. The supervision division will include representatives of local authorities, representatives of organizations such as the Women's Union, Fatherland Front, Veterans, Association, representatives of local people... This supervision division in collaboration with independent monitoring unit of the Project will monitor the project activities based on indicators of social safety. Indicators of rehabilitation, production, environmental sanitation, traffic will be built to serve the monitoring plan of the Project. The grasping reality will help community supervision division report information related to the project progress, problems arisen during the project implementation to the PMU.
for promptly actions. The responsibility of this division is to collect feedback from the people and competent authorities as well as from the PMU. At the same time, people are also involved in the supervision, safety guarantee and sanitation in the construction phase. The Community supervision division should be involved in the training plan on strengthening monitoring and evaluation of project activities, training on monitoring activity skills as a part of the participatory monitoring plan of the Project. It is noted that the Resolution 80/CP on community supervision for construction works in localities should be applied.