PHU THO PROVINCIAL PEOPLE’S COMMITTEE
DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT

VIETNAM DAM REHABILITATION AND SAFETY PROJECT

REPORT
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
PROJECT: REPAIR AND IMPROVEMENT OF BAN RESERVOIR, TIEN LUONG COMMUNE, CAM KHE DISTRICT – PHU THO PROVINCE
(Updated Report)

PHU THO, OCTOBER 2018
EXECUTIVE SUMMARY

1. Background: The repair and rehabilitation of Ban reservoir has been identified for priority implementation under the Dam Rehabilitation and Safety Improvement Project (DRSIP), a project being developed for World Bank funding. The proposed works have been determined based on the Dam Safety Assessment being conducted in accordance with the World Bank Policy on Safety of Dams (OP/BP 4.37) and the Vietnam dam safety standards. It is subjected to Environmental and Social Impact Assessment (ESIA) in compliance with the requirements of the World Bank OP/BP 4.01. The following is a summary of the updated ESIA report.

2. Ban reservoir is located in Tien Luong Commune in the Cam Khe district of Phu Tho province. It was built in 1976. The reservoir has a storage capacity of 1.68 million cubic meters and supplies irrigation water to about 150 ha of agricultural land belonging to the residents of Tien Luong commune. Due to the long-time exploitation, the dam is now in urgent need of repair and rehabilitation. The current status of headworks is as follows:
   - The dam is an earth dam with a total length of 354 m, and crest height of 11.0 m, consisting of three dams A, B, C. The upstream face of dam has not been reinforced and some places near the spillway has already been eroded.
   - The spillway is also an earth spillway. In the rainy season, the flood discharge capacity proved inadequate and the spillway has suffered serious erosion, especially at the downstream side. To remedy this inadequacy, before each rainy season, the local people have to discharge water through the drain to prevent erosion at the spillway thereby effectively reducing the water holding capacity of the reservoir.
   - The outlet works intake has a broken valve and the outlet works needs to be repaired or replaced.

3. Downstream of the Ho Ban reservoir live about 194 households, of which 102 are considered poor or nearly poor, cultivating 150 ha of rice and vegetables. The deterioration of Ban irrigation works has reduced the irrigation water supply and water supply for other uses which is vital for the economic development of the area. It also threatened the safety of the downstream communities, farms and properties.

4. The current status of dams not ensuring safety. At Dam A, the dam crest is used as road by the locals resulting in the deformation of the crest due to the impact of vehicle traffic. At the edges of the upstream and downstream slopes, trees have overgrown providing habitat for burrowing animals that may have further affected the integrity of the dam structure. The current width of the crest is only 4.0 m which is smaller than the minimum standard width for compacted earth dam TCVN8216-2009 (III. level work, minimum crest dam width B=5m). Thus, expansion and reinforcement of crest dam is necessary. The upstream slope of the dam has not been fixed and many trees grow on the slope. In addition to this situation, the effect of increasingly severe weather events such as heavier rains and stronger winds could cause erosion and landslides. Similar with Dam A, the crest of Dam B is also used as road by the local community. The road is an unpaved earth road with uneven surface. There are also many trees and plants on the edges of the upstream and downstream slopes. There is no breakwater wall, lighting system, displacement landmark for monitoring or seepage on dam body monitoring equipment. Dam C crest is also used for travelling purpose, this road is earth currently with a lot of convex and concave. On dam crest, at edge of both upstream and downstream slope, trees overgrow. Dam crest is affected by both nature and human. Dam crest is deformed, eroded and recessed, not reinforced. That may affect safety and stability of dam.

5. Proposed rehabilitation works. The rehabilitation of reservoir is intended to: (i) ensure the safety of the reservoir during operation, retrofit for extreme weather events; and, (ii) meet increasing demands for water supply in the downstream area by ensuring that the original design goal of supplying water to 150 ha of rice and vegetables is achieved. The proposed works include the repair and upgrade of the dams, the spillway, the outlet works intake, and the repair of the construction and management routes, including some structures along the construction route. The project has been designed and will be implemented in accordance with World Bank Safety of Dam Policy (OP/BP 4.37) and dam safety standards and criteria of the Socialist Republic of Vietnam.
6. Environmental and Social Screening. The subproject underwent mandatory environmental and social screening as agreed with the World Bank, to among others, 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 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 significant ethnic minorities and they account for 6.3% of population in Tien Luong commune. However, they generally do not live in cluster or communities but integrated with mainstream population and impacts caused by the project will affect overall community, but not particularly to an ethnic group. There are no graves, temples or any structure or sites with cultural, religious or historical significance in the subproject area. Due to urbanization, there are no more pristine forest, critical natural habitat, or protected natural areas within 20 km radius of the construction site. There are no rare plants and animal species that need to be preserved.

7. Environmental and social impacts and mitigation measures: The subproject will bring in considerable benefits to the local community in the form of improved safety, stable and reliable water supply and general improvement in the landscape of the dam. However, the project implementation will be results in some negative impacts and raise some issues that need to be addressed, as follows:

8. Loss of land and crops – The subproject will permanently affect 0.67 hectares of residential land, garden land, other agricultural land and assets on land of 36 households. In addition, about 0.57 hectares of land that is currently managed by the local authorities will be permanently affected for construction purposes. No household must be relocated as the land to be used. The crops to be affected consist of 4,535 fruit trees, including apple trees, guava trees, grapefruit trees, star fruit trees, litchi, longan, papaya, mango, banana and timber trees such as acacia, eucalyptus, etc.

9. Impacts of construction activities. The negative impacts of construction activities are as follows:
   - Temporary increase in sedimentation of the waterways during rainy days due to earthmoving activities. The subproject will require excavation of 6,400 cubic meters of soil materials which will be mostly utilized for backfilling, only less than 100 cubic meters will be disposed.
   - Increase in dusts nuisance within the construction site and along construction routes
   - Increase in noise levels within the construction site
   - Interruption in water supply during the repair works affecting agricultural production in irrigation service areas and domestic water supply
   - Possible damage of existing roadways due to heavy equipment traffic particularly the hauling of embankment materials
   - 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 from a maximum of 50 workers) will not be significant but these would require standard containment (i.e. septic tank, soak pit), 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. Long term impacts – The following are long term negative impacts, expected to be felt beyond the completion of the subproject.
   - Land and soil degradation – This could occur at the construction sites and vicinities due to loss of vegetation, alteration of landscape due to excavation, compaction, construction spoils, litters and wastes.
   - Increased use of pesticides - The improved irrigation water supply is also expected to promote intensive agricultural production in the service area thereby increasing use of pesticides.

11. Mitigation Plan: To address these impacts, an Environmental Management Plan (ESMP) has been prepared as part of this ESIA report. The ESMP requires the adoption/implementation of the various
other safeguards instruments which have been prepared for the sub-project such as, the Resettlement Action Plan/Compensation Plan. The specific measures in the ESMP include:

- Implementation of the RAP: The fund for the preparation and implementation of compensation, support and resettlement of the subproject will come from the counterpart fund (state budget of Phu Tho province). The cost for land compensation is 583,000,000VND. The cost for trees and crops compensation is 130,000,000VND. The compensation cost for architectural facilities is 444,000,000VND. The support cost is 158,000,000VND. The other costs is 67,000,000VND.

- Careful and optimal scheduling of construction activities to coincide with fallow periods, in close 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 levelling of stockpiled surface soils in the burrow pit area and returning the ground for people to continue farming.

- 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

- Adoption of Chance Find Procedure and Unexploded Ordnance Procedure.

12. Consultation: Two consultation meetings were held. The first was in January 24, 2015 with 11 participants. The participants in this meeting were at Phu Tho Province DARD, Department of Natural Resources and Environment, Department of Construction, Department of Transportation, Department of Culture, Department of Health, Department of Education. The second consultation meeting was on January 29, 2015 with 30 participants. The participant included representative of Commune People’s Committee, Fatherland Front Board, social organizations, the affected households and local people in project area. Environmental and social impact assessment consultation: The land acquisition of Phu Tho subproject is not significant since the upgrading and repair based in the former line; therefore the adverse impacts can be minimized and land acquisition scale is insignificant. The affected households want to be compensated adequately and manifestly according to the replaceable price for damaged assets and the market price for temporary affected farming products. People expect the PMU and contractor execute the project with high quality. The implementation of the project should be met the schedule. Project implementation procedure will be complied strictly from the investment plan to construction activities.

13. Resettlement action plan: The subproject will permanently affect a land area of 1.24 ha of mostly agricultural land, residential land and garden land of 36 households and land that is currently managed by Commune for construction purposes. No household will be relocated as the land to be used. The crops to be affected consists of 4,535 fruittrees, including apple, guava, grapefruit, star fruit, litchi, longan, mango, etc. The fund for the preparation and implementation of compensation, assistance and resettlement of the project will come from the counterpart fund (state budget of Phu Tho province). The cost for land compensation is VND 583,000,000. The cost for trees and crops compensation is VND 130,000,000. The compensation cost for architectural facilities is VND 444,000,000. The support cost is 158,000,000 VND. The other cost is 67,000,000 VND.

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14. Risk of dam broken failure: If the dam is broken, the losses of lives and property of the people in downstream area are immeasurable because, the downstream of Ban reservoir supports 196 households on a land area of about 20,000 ha. Infrastructures in the area consist of about 250 houses, 1 kindergarten, 1 primary school, 5 cultural center houses, 1 temple in zone 7, 4 transformer stations in zone 5, 7, 8, 9, inter-village road system, inter-district road passing zone 6 connecting to Yen Lap district, and many other works. Local people primarily depend on agriculture, in case of inundation and flood, the whole cultivated area will be destroyed, resulting into lack of food, which may take many years to return to initial condition ensuring for farming. Currently, the following infrastructures are protected by the Ban dam: 6.2 km of access road, 8.1 km of canal route, 1 school, 1 health center, and 2 administrative offices.

15. Budget allocation: Both ODA fund and Counterpart fund of Vietnam Government are used for sub-project investment. Total budget estimation is: 30,088,212,000 VND. This budget includes the estimated cost of ESMP implementation of 853,942,000 VND (USD39,100). In which, cost for training and capacity building is 330,000,000 VND (USD 15,110), and environmental and social monitoring of 523,942,000 VND (USD 23,990).
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<td>AP</td>
<td>Affected People</td>
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<tr>
<td>BOD</td>
<td>Biochemical Oxygen Demand</td>
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<tr>
<td>CPC</td>
<td>Communal People’s Committee</td>
</tr>
<tr>
<td>CPO</td>
<td>Central Project Office (MARD)</td>
</tr>
<tr>
<td>CSC</td>
<td>Construction Supervision Consultant</td>
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<tr>
<td>DARD</td>
<td>Department of Agriculture and Rural Development</td>
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<tr>
<td>DO</td>
<td>Dissolved Oxygen</td>
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<tr>
<td>DONRE</td>
<td>Department Of Natural Resources and Environment</td>
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<td>DPC</td>
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<td>ESIA</td>
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<td>ESMF</td>
<td>Environmental and Social Management Framework</td>
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<td>GoV</td>
<td>Government of Vietnam</td>
</tr>
<tr>
<td>HH</td>
<td>Household</td>
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<tr>
<td>IMC</td>
<td>Irrigation Management Company</td>
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<tr>
<td>MARD</td>
<td>Ministry of Agriculture and Rural Development</td>
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<tr>
<td>MONRE</td>
<td>Ministry of Natural Resources and Environment</td>
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<tr>
<td>NTR</td>
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<tr>
<td>OP</td>
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<td>WHO</td>
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The “Repair and Improvement of Ban Reservoir” is one of the 12 sub-projects identified for first year implementation under the Dam Rehabilitation and Safety Improvement Project (DRSIP, WB8). The DRSIP is a World Bank-funded project in support to the Dam Safety Program of the Vietnam Government through the rehabilitation and safety upgrade of a number of priority dams and reservoirs. The main objective of the dam rehabilitation is to protect and infrastructure downstream of the dam while at the same time improving the long term viability and operational efficiency of the reservoir.

This Environmental and Social Impact Assessment (ESIA) is carried out in compliance with the Vietnam's Law on Environmental Protection (LEP) and the World Bank's Environmental Assessment Policy (OP/BP 4.01) and other relevant policies applicable to this project.

1.1 Approaches and Methodologies of the Environmental Impact Assessment

The environmental assessment was conducted through a combination of methodologies and approaches, as follows:

Field Survey Method: Collecting, synthesizing results from studies related to the project; Collecting and analysis data on topography, geology; meteorological, hydrological conditions; socio-economic conditions in the subproject area. This method is used to review natural, socio-economic condition of the project area.

Sociological survey method: Conducting field survey, interviewing affected people (AP), local authority in affected areas and beneficiaries.

Environment Survey: This involves:

- Conducting a survey on realistic environment by field sampling and analysis of criteria at the laboratory to determine the status of surface water quality, groundwater quality and soil quality in the subproject area and surrounding areas;
- Air quality is collected from the background environment reports of Nghe An province or from related projects in the project area in 2014.
- The quality of surface water, ground water was taken by water sampling device as regulated in TCVN 6663-6:2008 (ISO 5667-6:2005). Handling and storage of water samples as regulated in TCVN 6663-14:2000 (ISO 5667-14:1998);
- The samples were taken out at the locations, which are shown on the sampling map as in Appendix A2. Samples of soil, water after taking were preserved and delivered to the standardized laboratory of the Station of Environment Monitoring and Analysis to analyze.

Rapid Appraisal Method: Use the pollution factors of the World Health organization (WHO) established to:

- Evaluate the pollution load in wastewater and gas emissions.
- Develop measures to mitigate pollution;
- Estimate the load and concentration of pollutants generated during the construction and operation stages of the project, which evaluated quantitatively and qualitatively the impacts on the environment.

Comparison Method: Evaluating the impacts by comparison among the norms and standards for the quality of soil, water, noise, air and environmental standards related.

1.2 Approaches and methodology for social assessment

The purpose of this social assessment (SA), conducted in an integral manner with environmental assessment for this subproject, is two-fold. First, it examined the potential impacts of the subproject – positive and adverse impact –on the basis of planned project activities. Second, its findings inform the design of measures addressing identified potential adverse impact and proposing community development activities that are relevant to the project development goal. For identified adverse impact
that could not be avoided, consultation with local people, governmental agencies, project stakeholders, etc., were carried out to ensure affected peoples will be appropriately compensated for, and supported in a manner that their socioeconomic activities will be promptly and fully restored to the pre-project level, at least, and that their livelihoods will not be worsened off, in the long run, as a result of the subproject.

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 with them 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). A gender analysis was also done as part of the SA to understand underlying gender dimensions (from project impact perspective) to enable gender mainstreaming to promote gender equality, and enhance further the development effectiveness of the subproject, and the project as a whole. Depending on the magnitude of the identified potential project impact, and the project development objective, a gender action plan and gender monitoring plan were prepared (please see these plans in the Appendix 7 of this ESIA).

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 1 for how the Sampling Frame). A total of 177 of respondents participated in the SA exercise for this subproject, of which 128 people participated in the households survey (quantitative), and 49 people participate in focus groups discussions, community meetings, key informant interview (qualitative).

In Section 5, we will present the findings of the SA (positive and positive impact), including the result of the gender analysis. In section 4, we will present briefly the SA results, along with the recommendations on the basis of the SA findings. A gender action plan and gender monitoring plan are presented at Appendix 7 of this ESIA, and the public health intervention plan and public consultation and communication plan were presented at Appendix 5 and 6, respectively).
PART 2
SUB-PROJECT DESCRIPTION

2.1 Overview
Ban Reservoir was built in 1976. It is a Grade IV construction with basin area of 2.48 km$^2$, capacity of 1.05 x 10$^6$ m$^3$ and normal water level at +31.5 m. The work system includes: reservoir, a dam composed into three segments (A, B, C), a spillway, a water intake, irrigation canal and a management road. The dam is a homogenous earth with total length of 353.8 m, height of 11 m and a designed crest width of 6.5 m. The spillway has threshold elevation of +31 m, 20 m wide with a designed flood discharge capacity of 18 m$^3$/s. The water intake which is located at Dam C, is a steel-encased concrete culvert, which is 35m long with bed elevation of +27 m, designed flow capacity of 0.23 m$^3$/s. The degradation of Ban reservoir has decreased its capacity to supply water to the farms and threatens the safety of the downstream area.

Objectives of the subproject. The objectives of the subproject is to repair and rehabilitate the Ban Reservoir in order to improve safety and to ensure stable supply of irrigation water for the about 150 hectares farm land.

Subproject owner:
Department of Agriculture and Rural Development, Phu Tho province
Address: No. 215, Minh Lang str., Tien Cat ward, Viet Tri city, Phu Tho province.
Phone number: 0210. 3 812 891

Location of the subproject:
Ban Reservoir is located at coordinates at 21°28’20” north latitudes and 105°01’ east longitude, in Tien Luong commune, about 12 km from the center of Cam Khe district to the North-West. The areas benefited by the Reservoir are the communes of Tien Luong and Tuy Loc.

Geographical location:
- The north borders with communes Minh Coi, Vo Thanh - Ha Hoa district;
- The south borders with communes of Ngo Xa, Phuong Vy - Cam Khe district;
- The east borders with communes Ngo Xa, Tuy Loc - Cam Khe district;
- The west borders with Luong Son commune - Yen Lap district;

Figure 2 - 1: Location of the subproject
**Figure 2 - 2: Affected areas of the subproject**

*Total investment budget:* The estimated cost of the subproject is presented in Table 2-1. The total investment for the subproject is **25,101,107,000 VND**. Of which VND 19.657 billion (accounting for 78%) is from the Official Development Assistance fund and VND 5.442 bil. (accounting for 22%) will come from counterpart fund of Vietnamese government.

**Table 2 - 1: Budget for project implementation**

<table>
<thead>
<tr>
<th>No</th>
<th>Constructed categories</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Construction cost</td>
<td>16,545,255,000</td>
</tr>
<tr>
<td>2</td>
<td>Project management cost</td>
<td>390,036,000</td>
</tr>
<tr>
<td>3</td>
<td>Cost for construction investment consultation</td>
<td>6,318,476,000</td>
</tr>
<tr>
<td>4</td>
<td>Other cost</td>
<td>1,565,339,000</td>
</tr>
<tr>
<td>5</td>
<td>Site clearance, compensation cost</td>
<td>2,500,000,000</td>
</tr>
<tr>
<td>6</td>
<td>Preventive cost (10%)</td>
<td>1,703,106,000</td>
</tr>
<tr>
<td>7</td>
<td>Total</td>
<td><strong>30,088,212,000</strong></td>
</tr>
</tbody>
</table>

(Source: Subproject investment report)

**2.2 The Present Conditions Of The Headworks Dam A**

At Dam A, the dam crest is used as road by the locals resulting in the deformation of the crest due to the impact of vehicle traffic. At the edges of the upstream and downstream slopes, trees have overgrown providing habitat for burrowing animals that may have further affected the integrity of the dam structure. The current width of the crest is only 4.0m which is smaller than the minimum standard width for compacted earth dam TCVN8216-2009 (III. level work, minimum crest dam width B=5m). Thus, expansion and reinforcement of crest dam is necessary.
The upstream slope of the dam has not been fixed and many trees grow on the slope. In addition to this situation, the effect of increasingly severe weather events such as heavier rains and stronger winds could cause erosion and landslides.

Due to lack of management capacity and lack of awareness of the people, many activities have been allowed on the dam that have helped further degraded it, such as the planting of trees on the dam slopes, farming on dam crest, digging of ponds for aquaculture right at the foot of the dam’s downstream face. Such activities, combined with the seepage and leakages and the lack the drainage have made the dam unsafe. The dam needs emergency repair, and modernized management system that clearly provide rules for prohibited activities and provide awareness campaigns to the local community about dam safety.

**Dam B.** Dam B is a homogenous earth dam, situated 92.75m toward the right side of Dam A. It has an elevation of +31.5m; length of 145.6 m; width of 4.0m. Similar with Dam A, the crest of Dam B is also used as road by the local community. The road is an upaved earth road with uneven surface. There are also many trees and plants on the edges of the upstream and downstream slopes. There is no breakwater wall, lighting system, displacement landmark for monitoring or seepage on dam body monitoring equipment.
The existing condition of upstream slope of dam B

Figure 2 - 5: The existing condition of upstream slope of dam B

The downstream slope of dam B has slope coefficient of 2.5 as per management document. Currently, some portions are deformed by runoff erosion because of lack of drainage from the crest. Slope coefficient in many sections is only 0.5 as trees and overgrowth invade the slopes.

Dam C is at distance of 85 m from B dam, on the right side of dam B. Crest elevation is of 31.5m; length of 87.2m, width is 4m; dam crest is also used for travelling purpose, this road is earth currently with a lot of convex and concave. On dam crest, at edge of both upstream and downstream slope, trees overgrow. Dam crest is affected by both nature and human. Dam crest is deformed, eroded and recessed, not reinforced. That may affect safety and stability of dam.
Spillway

The spillway is located on the left side of Dam A. It is a free flowing type (i.e. no control gate). The entrance, threshold, body and downstream stilling basing are all pure earth. The width of spillway under the initial design is 10m. However, the current spillway width and the chute can no longer be determined because of the structure has been deformed and invaded by trees. At the downstream end of the chute, there is no device for drainage and there is no reinforcement. Trees have overgrown on both sides, at end and on the body of the chute.

Intake

The intake is severely degraded with water leaking from intake body. The gate is broken and filled with sediments. Part of the entrance is eroded and slipped. The valve staging system is in a rundown condition while the valve is damaged. People put a lot of sandbags in front of the valve to close it. When opening the intake, management unit must mobilize workers to wade into the water to remove the sandbags. It usually takes up to 6 hours to open the valve. This work endangers the lives of the operator.
Access Road

The management road is 1.6 km long and has an irregular carriageway width of 3.0 to 4.0m. The road is an unpaved earth road with uneven surface and many potholes. It is also used by the local people to move around the area. The road is narrow and degraded contributing to the difficulty in managing and operating the dam and in undertaking any rescue in case of emergency.

1.2 The Proposed Rehabilitation Works

Table 2-2 summarizes the work to be done under the subproject. The repairs and upgrade will be undertaken on the Dam, the Spillway, the Water Intake, the Administration Building and the Access/Management Road.

<table>
<thead>
<tr>
<th>Structure/Facility</th>
<th>Current parameter</th>
<th>Upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam</td>
<td>Earth dam is 11m high, dam crest is 354m long, and 6.5m wide; including 3 dams A, B, C; Upstream slope has not been reinforced, some places near the spillway has been eroded causing seepage formed.</td>
<td>Remain as the current condition, just move the centerline of the dams: Dam A: Move the centre line of the dam 4m toward upstream; Dam B, dam C: Move the centre line of the dam 4.5 m toward upstream Treatment of the seepage on upstream slope; Reinforcing top of the downstream and the upstream slope with concrete; Planting of grass and installation of drainage facilities on the downstream slope.</td>
</tr>
<tr>
<td>Spillway</td>
<td>Elevation of spillway is 31.5m; 10m wide. Currently, the spillway is earth, design flood flow is 18 m³/s</td>
<td>A new spillway will be constructed on the left side of Dam A, near the existing spillway about 5m toward Dam B. The elevation and width of the spillway will be the same: 31.5m and 10m respectively. The spillway will be repaired and upgraded by concrete M150, encasing reinforcement concrete M200 with thickness of 20cm.</td>
</tr>
<tr>
<td>Structure/Facility</td>
<td>Current parameter</td>
<td>Upgrade</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------</td>
<td>---------</td>
</tr>
<tr>
<td>The chute</td>
<td>The chute will be made of reinforced concrete M200; 20.45 m long with slope of i=34.22%; width of spillway is 10 m. It will also be a freely spillway threshold, stillingbasin at the ending of the chute. Design flood discharge flow of $Q_{\text{design}} = 27.13 \text{ m}^3/\text{s}$. Before construction of bridge crossing the spillway, a detour/bypass will be provided to allow people to cross to the other side. Before construction of bridge crossing the spillway, a detour/bypass will be provided to allow people to cross to the other side.</td>
<td></td>
</tr>
<tr>
<td>Outlet works</td>
<td>Outlet works is located at dam C, 35 m long, is steel encased concrete M200, diameter $\Phi 600$ mm, design $Q = 0.23 \text{ m}^3/\text{s}$, water intake bed elevation is 27 m. The drain valve has current been broken, drain body is broken, upper valve cannot be used anymore. A new water intake will be installed, 5 m from the old one, on the right side of dam C, do not occupy the land. It will be 42.76 m long and will be made of steel-encased concrete (M200) with diameter of 600 mm and a design discharge capacity of $Q_{\text{design}} = 0.23 \text{ m}^3/\text{s}$.</td>
<td></td>
</tr>
<tr>
<td>Management house</td>
<td>The new management house will be built at the location between Dams A and B, at elevation of +34.0. The building comprises of 3 function rooms. Fence will be built by brick, yard will be poured by concrete M150.</td>
<td></td>
</tr>
<tr>
<td>Access and management road</td>
<td>It is earth-filled road which 1600 m long, steeply and difficult to travel during rainy season. Repair, upgrade the management road, connecting to the dam with length $L = 1430$ m, road base width of 4 m, road pavement width of 3 m, road structure of concrete M250, 20 cm thick, beneath the concrete layer is sand layer 3 cm thick and 15 cm in thickness of macadam material.</td>
<td></td>
</tr>
</tbody>
</table>

*Volume and Scale of Construction Works*. Table 2-3 estimates the volume of construction works and the transportation of soil, rock and building materials.

**Table 2 - 3**: Estimated stone and construction materials transportation activities
<table>
<thead>
<tr>
<th>Items</th>
<th>Location</th>
<th>Quantity (exploring capacity)</th>
<th>Distance to construction site, transport routes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borrow pit</td>
<td>Zone 4, Tien Luong</td>
<td>About 20,000 – 40,000m³</td>
<td>0.02 – 0.5km</td>
</tr>
<tr>
<td>Quarry</td>
<td>Cam Khe township</td>
<td>Not determined</td>
<td>25-30 km</td>
</tr>
<tr>
<td>Equipment suppliers</td>
<td>Viet Tri city</td>
<td>Not determined</td>
<td>80 km</td>
</tr>
<tr>
<td>Disposal site</td>
<td>Zone 4, Tien Luong, at ending point of the management road</td>
<td>300,000m³</td>
<td>2.5km</td>
</tr>
<tr>
<td>Construction materials suppliers</td>
<td>Cam Khe township</td>
<td>Not determined</td>
<td>7 km</td>
</tr>
<tr>
<td>Storage area</td>
<td>Zone 5, Tien Luong</td>
<td>1000 m²</td>
<td>300m</td>
</tr>
</tbody>
</table>

It is estimated that an amount of 30,612.52 m³ of topsoil in the borrow pit will be removed and demolished from old structure, about 45,979.31 m³ of filled soil will be required to finish the work. About 22,717.18 m³ of excavated soil will be used to fill the dam. Thus, about 7,895.34 m³ of removed earth will be transported to disposal site. The amount that will be utilized as backfilled soil is m³. Disposal site is about 2 to 2.5 km from the construction site. Estimated capacity of the disposal site is about 1,000 to 1,500 m³. In the plan for new rural development of the commune, the disposal site will be used as the site of the public market. A small amount (545.6 m³) of materials will be extracted from a borrow pit adjacent to the access road, which is currently a hill with planted eucalyptus and estimated available soil of about 20,000 m³ to 40,000 m³. The borrow pit area is currently managed by 3 HHs from zone 4 of Tien Luong commune.

1.3 Number of workers, machinery, and equipment for construction

The preparation stage of land clearance will need 20 to 30 workers in the short term (1 month). The number of workers and staff in the construction site at the peak of the construction activities will be about 50 people.

Table 2 - 4: Expected machinery, and equipment used for construction

<table>
<thead>
<tr>
<th>№</th>
<th>Name</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bulldozer</td>
<td>110 CV</td>
</tr>
<tr>
<td>2</td>
<td>Excavator</td>
<td>Bucket 1.6 m³</td>
</tr>
<tr>
<td>3</td>
<td>Truck with load</td>
<td>7 to 10 T</td>
</tr>
<tr>
<td>4</td>
<td>Mixer</td>
<td>250 l</td>
</tr>
<tr>
<td>5</td>
<td>Concrete compactors</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Generator</td>
<td>100 KVA</td>
</tr>
<tr>
<td>7</td>
<td>Water pump</td>
<td>120 m³/h</td>
</tr>
</tbody>
</table>

1.4 The Construction Schedule

The construction schedule is provided in Table 2-5 below:

Table 2 - 5: Implementation schedule

<table>
<thead>
<tr>
<th>Construction categories</th>
<th>Construction time (month)</th>
<th>Beginning time</th>
<th>Finishing time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water intake</td>
<td>2</td>
<td>October</td>
<td>November</td>
</tr>
<tr>
<td>Dams</td>
<td>9</td>
<td>October</td>
<td>June</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>-----</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Spillway</td>
<td>9</td>
<td>October</td>
<td>June</td>
</tr>
<tr>
<td>Access road</td>
<td>4</td>
<td>September</td>
<td>December</td>
</tr>
</tbody>
</table>
CHAPTER 3: POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

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.

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 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

**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
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 m³ (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 100,000m³ 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).

**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-BTMT 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-BTMT 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.

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 safeguard 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:


3.4 Implications Of World Bank Safeguard Policies On The Proposed Project

Eight World Bank policies have been triggered for the 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 has been 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.

There are six transboundary river basins in the country; however Vietnam is an upstream riparian only in the Sesan-Srepok basin – a tributary of the Mekong, upstream of Cambodia, and the Bang Giang-KyCung basin, upstream of China. So, it is expected that some of the dams will be located on international river basins, and therefore the policy is triggered.

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 MARD and all DARDs.
CHAPTER 4: BASELINE CONDITIONS

4.1 Hydrology and Ecology of The Ban Reservoir and its Receiving Water Stream

The density of rivers in the project area is not uniform across regions from very sparse density level to thick density (0.46-1.94 km/km²). Distribution of river network is dense to very dense in the west and the northwest, where the rainfall level is the highest in the basin. The rainfall level in the East and the Northeast is low, distribution of river here is sparse. There are 3 large rivers flowing across Phu Tho province: Red River (segment from Lao Cai province to Viet Tri city named Thao River), Lo River and Da River. They join together in Viet Tri city, where called river junction. There is no river in Tien Luong commune, but Gianh stream crossing with length of about 5.5km; water volume is relatively plentiful.

Figure 4 - 1: River network

Source of Water. The main sources of Ban reservoir are the two small streams formed from the ravines of adjacent low hills. These streams flow entirely into the reservoir. The average flow rate of Ban reservoir is 0.048 m³/s, and the total of water amount is 1.527 million meter cubic per year. The catchment area of the Ban Reservoir is 2.48km². It is surrounded by low hills with elevations from 80 to 120m. The vegetative cover of this area is mainly regenerated forest consisting of commercial species of Acacia and Eucalyptus. Based on the survey and consultations with government, the local people, the Department of Natural Resources and Environment of Phu Tho province, Ban reservoir has no aquatic animals or plants that need protection or in the prohibited list.

Ban dam impounds water up to a capacity of 1,680,000m³ and diverts the flow to the irrigation system canals. Beyond the 1,680,000m³, the excess water flows through a spillway back into the original stream which is a tributary of Gianh River. The length of the downstream stream before the confluence with Gianh River is only 4km. It should be noted that the spillway of the dam is free flowing overflow type (i.e. it has no control gate). This means that when the reservoir is full and the outlet works intake is closed, the water flowing out through the spillway into the downstream channel will be equal to its original natural flow rate of the streams. If the intake gate is open and the reservoir is full, only the residual flow will go to the downstream channel. When the reservoir is not full no water will flow into the downstream channel. Since the streams are small, the interruption of the flow due to the dam was unlikely to have significant impact on the ecology of the Gianh River.

There receiving stream is not known to have overflowed during the 39 years of reservoir operations. Annual peak flood in the Ban reservoir is not big. According to the field survey, in normal working conditions, frequent flood water levels in the reservoir doesn’t even overflow to the spillway. Because
of the existing spillway is made of earth, flood water was discharged through the intake gate to prevent the erosion of the spillway. The receiving water channel of the spillway is also wide enough so the discharge will flow inside the channel.

Because of the size of the stream, its aquatic ecosystem can be characterized as unimportant both ecologically and economically. On the other hand the reservoir has provided an artificial permanent aquatic habitat for many species, including introduced commercial and edible species of fish. The species to be found in the reservoir as well as in the receiving channel includes traditional freshwater fish like grass carp, tilapia and small crabs. There are no fish species of endemic, rare, or species listed as endangered. Based on the analyses of water samples taken from the reservoir, the water is the reservoir easily meets the national criteria for irrigation and aquaculture (See section 4.4).

There is no forestry land area in land use profile of the Tien Luong commune. Common fruit trees planted in the area include banana, apple and grapefruit. People in surrounding area are mainly engaged in agriculture and small trade, planting mainly vegetables, fruits and rice. The animal species in areas are such as cattle, pigs, chickens, ducks, geese, goats, etc.

4.2 Climate And Meteorology

Ban reservoir is located in northern mountainous and midland region, in tropical monsoon region. The highest air temperature appears in the June, July, and August up to 38°C, the lowest is in December, January, and February of 4.1°C. Average temperature, even in high mountainous regions, is ranging from 12 – 23.3°C, temperature gap between hottest and coldest places is up to 12.5°C. The relative humidity of the air is high, monthly average humidity is over 80%.

Average wind speed of the study basin has the lowest level compared with other regions of the country. The common annual average wind speed is around 1.0 to 1.5 m/s. Usually, the wind in March, April is stronger than other months. The average sunshine hours annually are from 1350 to 1500. From May to July in summer are the sunniest months of the year. The lowest sunshine hour months are February and December.

In this basin, average evaporation over 80mm appears only in the period from May to July. Annual rainfall of Ban basin area is \( X_0 = 1528\) mm

4.3 Topography and Geology

The Ban reservoir is located at coordinates at 21°28’20” north latitudes and 105°01’ east longitude, in Tien Luong commune, 12 km center of Cam Khe district to the North-West of Phu Tho province.

<table>
<thead>
<tr>
<th>No</th>
<th>Point</th>
<th>Longitude</th>
<th>Latitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Most easterly point</td>
<td>21°28’10”</td>
<td>105°01’06”</td>
</tr>
<tr>
<td>2</td>
<td>Most westerly point</td>
<td>21°28’09”</td>
<td>105°00’28”</td>
</tr>
<tr>
<td>3</td>
<td>Most southerly point</td>
<td>21°28’05”</td>
<td>105°01’05”</td>
</tr>
<tr>
<td>4</td>
<td>Most northerly point</td>
<td>21°28’25”</td>
<td>105°00’25”</td>
</tr>
</tbody>
</table>

Phu Tho is situated in northern mountainous and midland region of Vietnam. Benefited areas of Ban reservoir is Tien Luong commune and Tuy Loc commune. The reservoir is bordered with Minh Coi and Vo Thanh communes of Ha Hoa district to the north, with Ngo Xa and Phuong Vy communes of Cam Khe district to the south, with communes Ngo Xa and Tuy Loc communes of Cam Khe district to the east and with Luong Son commune of Yen Lap district to the west.
Topography

The study area is characterized by the general topography of Phu as mountains, midlands and plains interspersed. The topography is divided into various subregions. High mountainous subregion in the west and the north of the province, and low hill subregion is much fragmented, alternating with field and plain range along the Red River Delta, right bank of Lo River, left bank of Day River. The terrain is mostly mountainous, the flat land scattered. Mountainous region accounts for 79% of natural land area of the province; midland area accounts for 14.35%; plain – 6.65. The highest point has an elevation of 1,200 meters over sea level, the lowest point is 30m high; average height is of 250m compared to sea level.

Geology

No sign of fragment cutting through the reservoir area during mapping process is revealed. The reservoir bank is covered with weak permeability rock and soil; groundwater levels in the watershed line is much higher than normal water level. With such geological conditions, possibility of water loss into next basin from Ban reservoir is not likely to take place.

Backfilling soil layer: Mainly semi-heavy clay and few particle, yellow brown, reddish brown, hard plastic state, tightly medium structure. Thickness of the layer varies from 0.8 to 6.1m, distributed at dam A, B, C, outlet works intake and spillway route with medium water permeability.

- Layer 1: Semi-heavy clay and few particle and organic humus, gray brown, gray green (particle occupies for 1 to 6%, size 2-4mm). Soft plastic state, tightly medium structure. Layer 1 is distributed in the old stream bed heart, dam A, B, C and outlet works intake route, thickness varies from 0.8 to 3.1m with strong water permeability (according to NTR4253-86).

- Layer 4: Semi-heavy clay and few particle, yellow brown, reddish brown (particle componentis clay with soft friable texture, particle concentration occupies 1to 9%, size 2 to 10mm). Hard plastic state, tightly medium structured. Layer 4 is distributed in dam A, B, outlet works intake, thickness varies from 0.9 to 4.5 m with medium water permeability, (according to NTR4253-86).
4.4 Water Environment

Surface water

The catchment area of Ban reservoir is 2.48 km², the annual flow is 0.0288 m³/s, and the water active storage of Ban is 1.05x10^6 m³. Water source for irrigation mainly comes from Ban reservoir, while Ban reservoir does not meet the water requirements because the auxiliary works have been seriously degraded decrease capacity of the reservoir. The water level is often lower in the January to May every year.

There are 9 zones in Tien Luong commune taking water directly from Ban reservoir for agricultural production and partly for living purpose.

Table 4 - 2: Surface water sampling location

<table>
<thead>
<tr>
<th>No</th>
<th>Symbol</th>
<th>Sampling location</th>
<th>Coordinates X</th>
<th>Coordinates Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NM1</td>
<td>Upstream slope (reservoir bed)</td>
<td>527991,02</td>
<td>2374463,77</td>
</tr>
<tr>
<td>2</td>
<td>NM2</td>
<td>Dam position – irrigation canal</td>
<td>527576,87</td>
<td>2374638,04</td>
</tr>
<tr>
<td>3</td>
<td>NM3</td>
<td>Downstream area – irrigation canal</td>
<td>527206,32</td>
<td>2373494,01</td>
</tr>
</tbody>
</table>

The physical and chemical criteria (BOD₅, NO₂⁻, NO₃⁻, PO₄³⁻, SO₄²⁻) and heavy metal (As, Pb, Cd, Fe) of surface water are all below the allowed limitation in NRT08:2008/BTNMT, column B1 – water quality for irrigation, drainage and aquaculture.

Comparing to the above water quality analysis to NRT39:2011/BTNMT – National Technical Standards on water quality for irrigation, all criteria such as: pH, DO, SO₄²⁻, As and Cd are below the allowed limitation, ensuring quality for irrigation. The detailed results of surface water analysis are showed in Appendix 2.

Ground water quality

River network in the project area is quite dense, however rivers are mostly short and steep, water volume provided for ground water layer is insignificant.

According to survey data in 2015, since annual rainfall is uneven, water volume on rivers, streams, reservoirs depletes in dry season, which affecting not only the production but also to human activities people in the region.

Table 4 - 3: Ground water sampling location

<table>
<thead>
<tr>
<th>No</th>
<th>Symbol</th>
<th>Sampling location</th>
<th>Coordinates X</th>
<th>Coordinates Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NN1</td>
<td>House of Mr. Long, zone 4</td>
<td>527555,08</td>
<td>2374659,82</td>
</tr>
<tr>
<td>2</td>
<td>NN2</td>
<td>House of Ms. Ha, zone 3: 300m away from land fill</td>
<td>528176,3</td>
<td>2374572,69</td>
</tr>
<tr>
<td>3</td>
<td>NN3</td>
<td>House of Mr. Chien, zone 4, next to spillway area</td>
<td>527685,86</td>
<td>2374736,06</td>
</tr>
</tbody>
</table>

Analyzed results showed that ground water quality in project area is relatively good. Physical and chemical indicators (pH, total hardness) and indicators about toxic (Pb, As, Cd, Hg) are in the allowed limitation of NTR 09:2008/BTNMT; Ecoli and Coliforms criteria has not been found in water samples; excepting COD and Fe criteria. COD is from 2.5-4.5 times higher than the standard and Fe is from 25-4.6 times higher than the standard. These show that ground water in project area is polluting contamination.

Factors influence to water environment

In general, water quality in the subprojects region is at good condition, because within a radius of 30km there is no large scale industrial or urban waste source. The main factors affecting water resources in the subproject are:

Pesticides, chemical fertilizers used in agriculture
Domestic waste from households and farms. Currently, there are 5 livestock farms in the commune. Although these farms have been complied with the regulations on wastewater treatment in livestock but they are also as a source of minor impact on water quality.

Dust, garbage: These sources cause minor impact on water quality due to garbage thrown down in some locations around Ban reservoir.

4.5 Air Environment

Tien Luong is a mountainous commune in Cam Khe district, Phu Tho province. Except for the areas along the road in the dry season, it is little influenced by dust, but not significantly. According to the collected data, results of monitoring and analysis of ambient air quality at other communes around Tien Luong commune showed that the criteria are much less than allowed regulations (NTR 05: 2009/BTNMT);

The project scope is located far from the center, population density of the area is low. The main occupation is agricultural production. On the other hand, density of large trees is high. The work is located in geographical area of one commune, air environment is relatively clean, no signs of contamination.

Similar to air quality described above, there is almost no noise pollution source or vibration source in the area affected directly and indirectly by the project, excepting for sources from vehicles. It was observed that daily traffic flow is quite low, noise and vibration levels are within the allowed limits by regulation.

4.6 Soil Environment

**Table 4 - 4: Soil sampling location**

<table>
<thead>
<tr>
<th>No.</th>
<th>Symbol</th>
<th>Sampling location</th>
<th>Coordinates X</th>
<th>Coordinates Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>D1</td>
<td>At outlet works intake</td>
<td>5927914,73</td>
<td>2374376,63</td>
</tr>
<tr>
<td>2</td>
<td>D2</td>
<td>At spillway</td>
<td>527522,38</td>
<td>2374561,79</td>
</tr>
<tr>
<td>3</td>
<td>D3</td>
<td>Irrigation area in Zone 5</td>
<td>528067,31</td>
<td>2374322,17</td>
</tr>
</tbody>
</table>

As the results from analysis, heavy metal concentration in 3 soil samples is within allowed limitation (NTR 03:2008-BTNMT) for agricultural soil. Thus, in the study area there is no sign of pollution by heavy metal. The detailed results of soil sample analysis are shown in Appendix 2.

4.7 Socio-Economic And Cultural Characteristics

**Population**

The total population of Phu Tho province in 2011 was 1,327,600, of which 672,512 are women (representing 50.65%). Number of female employees is 439,794 people (representing 50.65%) of the total workforce of the province of 868,300. More than 34.52% of such female employees work in agriculture, forestry and fisheries sector, 10.63% higher than men (accounting for 23.89%). So there is a difference between male and female workers in agriculture, forestry and fishery workers because male workers was mobilized to work in the industrial sector (accounting for 15.54%) and services (accounting for 9.92%). This is also the reason for the big difference between the proportion of men and women working in the industrial and construction sector. This sector attracted 15.54% of male workers and only 3.95% of women workers, much less than men. The average unemployment rate of the province is 5%. However, this rate is 3% for men, and 7% for women, twice as much as men.

There are more than 28 ethnic groups living in Phu Tho province in which Kinh accounted for the largest percentage with 85.89% of the total population, the remaining 27 ethnic minorities accounted for 14.11% of the provincial population.

The main income of the people is from agriculture, forest and handicrafts. The products are mainly rice, other agricultural and livestock products. The average income is about VND25 million/person/year.
According to the statistics of 2014, population in Tien Luong commune is 5,927 people equivalent of 1,224 households, in 10 administrative areas. The average population density is 298 people/km², but uneven distribution. In which male accounts for 51.5% and female accounts for 48.5%. The population of working age is in a high proportion, about 65%. Population growth rate of the commune is of 1.15%/year. The inhabitants are scattered in 10 areas in the commune. Children under 16 years old account for 20% of the population.

**Socio-economy**

*General view of socio-economic condition in project area.* Phu Tho has 12 administrative units including Viet Tri city, Phu Tho town, Doan Hung, Ha Hoa, Thanh Ba, Cam Khe, Phu Ninh, Lam Thao, Tam Nong, Thanh Thuy Thanh Son and Yen Lap district. Viet Tri city is the political - economic – cultural center of the province; 274; commune-level administrative units consisting of 14 wards, 10 towns and 250 communes, including 214 mountainous communes 7 upland communes and 50 communes in extremely difficult.

The total natural area of Phu Tho is 3519.56 km², according to a recent soil survey, land of Phu Tho province is divided into the following groups: gold and red Feralit soil developed on clay, 116 266 27 ha accounted for 66.79% (area of investigation). Land altitude is usually above 100m with steep slopes, rather thick soil layer, heavy mechanical composition with rather high content of humus. This land is often used for forest plantations, some areas with the slope of less than 25° can be used to plant industrial crops.

Currently, Phu Tho still uses approximately 54.8% of potential agricultural – forestry – fishery land; unused land remains 81.2 thousand ha, of which there are 57.86 thousand hectares of hills and mountains.

Cam Khe district is located in the Northwest of Phu Tho province, is one of the 13 administrative divisions of Phu Tho province. With half mountain – half plain terrain, lower from Northwest to Southeast, this peaceful land is formed by two quite distinct regions: the mountains and the riverside. With a total natural area of 23,425ha, the length of the district is 45 km, the average width of the district is 4 km, Cam Khe borders Thanh Ba district to the East with the boundary of Thao river with red water all year-round by alluvium; borders Yen Lap district to the West by the acr mountain range in Hoang Lien Son range running along from the Northwest to the Southeast; borders Tam Nong district to the South by the Bua river flowing from the West to the East and pouring to Thao river, the boundary is the river flowing from west to east hammer down the river Sports; borders Ha Hoa district to the Northby the Gianh canal – a small branch of Thao river.

*The social-economic condition:* In the subproject area, Tien Luong commune is a mountainous province located in the Northwest of Cam Khe district, Phu Tho province. The survey found that this commune is a poor commune focusing on agricultural production, other industries, services and auxiliary industries account for a small proportion, the infrastructure for production is till poor, local people's life based primarily on agricultural production while a large area of agricultural land is dependent on natural conditions which are not active in irrigation, crop yields is precarious, often unstable, people's lives face many difficulties.

Tien Luong commune is poor agricultural commune of Cam Khe district. Economics of Tien Luong is mainly dependent on agricultural activities at the rate of labor in agriculture of about 75%. Time for agricultural activities accounts for about 30 to 40%, while the other occupation and services in local does not develop.

**Table 4 - 5: Synthesis of some basic information on the socio-economic conditions in Tien Luong commune**

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land area</td>
<td>1,990.28ha</td>
</tr>
<tr>
<td>Agricultural land area</td>
<td>1,629ha</td>
</tr>
<tr>
<td>Population</td>
<td>5,927 people (2014)</td>
</tr>
<tr>
<td>Rate of ethnic minorities</td>
<td>Kinh: 93.7%; ethnic people: 6.3%</td>
</tr>
</tbody>
</table>
Item | Value
---|---
Average income per person | 14.4 bil. VND
Population in working age | 4,200
Labors in agriculture | 75%
Labors in the field of handicrafts | 15%
Labors in service field | 15%

(Source: Statistic in Tien Luong commune, 2014)

Land use structure in subproject area is expressed in table below:

**Table 4 - 6: Land use status in subproject area**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Natural area (ha)</th>
<th>Agricultural land (ha)</th>
<th>Forestry land (ha)</th>
<th>Aquaculture land (ha)</th>
<th>Other agricultural land (ha)</th>
<th>Traffic land (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rice</td>
<td>Crop</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone 3</td>
<td>163</td>
<td>8,7</td>
<td>2,7</td>
<td>0</td>
<td>1,0</td>
<td>0,8</td>
</tr>
<tr>
<td>Zone 4</td>
<td>126</td>
<td>21,3</td>
<td>50,3</td>
<td>0</td>
<td>6,2</td>
<td>2,9</td>
</tr>
<tr>
<td>Zone 5</td>
<td>120</td>
<td>25,0</td>
<td>3,7</td>
<td>0</td>
<td>4,3</td>
<td>1,5</td>
</tr>
<tr>
<td>Zone 6</td>
<td>137</td>
<td>21,3</td>
<td>3,7</td>
<td>0</td>
<td>7,0</td>
<td>2,6</td>
</tr>
<tr>
<td>Zone 7</td>
<td>70</td>
<td>3,5</td>
<td>1,3</td>
<td>0</td>
<td>3,2</td>
<td>2,0</td>
</tr>
<tr>
<td>Zone 8</td>
<td>89</td>
<td>3,7</td>
<td>2,0</td>
<td>0</td>
<td>3,5</td>
<td>2,1</td>
</tr>
<tr>
<td>Zone 9</td>
<td>176</td>
<td>1,8</td>
<td>4,0</td>
<td>0</td>
<td>2,3</td>
<td>1,8</td>
</tr>
<tr>
<td>Total</td>
<td>881</td>
<td>85</td>
<td>68</td>
<td>0</td>
<td>28</td>
<td>14</td>
</tr>
</tbody>
</table>

Demographics: The average number of household members in the survey sample in the project area is 4.4, much higher than the national average demographics in households, which is 3.9 (Statistical Yearbook, 2013). There are no difference in the number of inhabitants per household between communes, ethnic groups, income groups, female-headed households and male-headed households.

In terms of ethnic minorities, the average scale of an ethnic minority is 4.5 persons and that of Kinh group is 4.4 persons. By gender of head of household, number of female-headed households is less people than its of male-headed households (respectively 4.35 compared with 4.46) (Pls refer to Table 4-7).

**Table 4 - 7: Demography and average laborers per household**

<table>
<thead>
<tr>
<th>Content</th>
<th>Demography</th>
<th>HH structure by scale of Demography (%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average in HHs</td>
<td>1-2 people</td>
<td>3-4 people</td>
</tr>
<tr>
<td>Total sample</td>
<td>4.4</td>
<td>22.8</td>
<td>36.2</td>
</tr>
<tr>
<td>By commune/ Ward</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tien Luong</td>
<td>4.4</td>
<td>22.8</td>
<td>36.2</td>
</tr>
<tr>
<td>By ethnic minorities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Kinh</td>
<td>4.4</td>
<td>21.5</td>
<td>36.5</td>
</tr>
<tr>
<td>+Ethnic minority</td>
<td>4.5</td>
<td>17.9</td>
<td>38.3</td>
</tr>
<tr>
<td>By HH gender</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
+ Male Headed households | 4.46 | 20.5 | 38.8 | 33.2 | 7.5
+ Female Headed households | 4.35 | 21.9 | 34.9 | 35.2 | 8.0

By income group

<table>
<thead>
<tr>
<th>Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 (the poorest)</td>
<td>18.3</td>
</tr>
<tr>
<td>Group 2</td>
<td>19.2</td>
</tr>
<tr>
<td>Group 3</td>
<td>15.3</td>
</tr>
<tr>
<td>Group 4</td>
<td>14.8</td>
</tr>
<tr>
<td>Group 5 (The richest)</td>
<td>13.8</td>
</tr>
</tbody>
</table>

Source: Survey Data

By income groups, for Tien Luong commune, the HH size of 5 persons and more is equal in groups by income, group 1 (36.2%), group 2 (37.5%), group 3 (37.5%), group 4 (35.7%) and group 5 (the richest 35.2%). This indicates that in Tien Luong commune, the large scale family with many members is also one of the reason from poverty of people in the commune, the rate of 3rd and 4th child in the commune is still popular.

The analysis of the household structure by demographic scale in the project area showed a majority of households has 3-4 person (36.2%) and 5-8 persons (33.0%); those households with 1-2 persons (22.8%) is popular in the families of communal officers, those households with 9 persons and more only accounts for 8%. Compared to the size of nuclear family in Vietnam, the rate of families with many children in Tien Luong is rather high.

Thus, the survey data shows that the model of few member family occupies higher percentage, this also make the economic conditions of surveyed households develop slowly and at average level and indicating that the development of the project area is also at average level.

**Occupational structure:** Among the occupational structures of family members having jobs and income in the project area survey, agro-forestry-fishery sector accounts for 58.6% as the highest; small handicrafts have the percentage of 9.6% as the second rank; remaining are staff-officers, employees, workers with the percentage of less than 10% for each category. Thus, the agriculture-forestry-fishery is the dominant sector in the economy - society of the project area, where the majority of the workforce lives.

**Table 4 - 8: Main occupation of laborers**

<table>
<thead>
<tr>
<th>Contents</th>
<th>Labor health loss</th>
<th>Agriculture forestry and fishery</th>
<th>Trade and services</th>
<th>Official and employees</th>
<th>Pupils and students</th>
<th>Handicraft</th>
<th>Hired</th>
<th>Jobless</th>
<th>Not suitable</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total samples</td>
<td>3.0</td>
<td>58.6</td>
<td>8.5</td>
<td>3.0</td>
<td>5.8</td>
<td>9.6</td>
<td>6.5</td>
<td>5.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>By communes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tien Luong</td>
<td>3.0</td>
<td>58.6</td>
<td>8.5</td>
<td>3.0</td>
<td>5.8</td>
<td>9.6</td>
<td>6.5</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>By ethnic minorities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Kinh</td>
<td>4.2</td>
<td>58.0</td>
<td>7.8</td>
<td>5</td>
<td>6.5</td>
<td>8.5</td>
<td>5.6</td>
<td>4.4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
The rate of HHs which do agriculture-forestry-fishery of Kinh group is equal to ethnic minorities (58.0% compared to 54.2%). In addition, the rate of HHs with non-agricultural occupation of Kinh group is also equal to ethnic minorities. For Kinh households, the rate of business households accounts for 10.5% and the rate of employed people in ethnic minorities also accounts for 6.5% only.

In terms of occupational status, the contribute to the family income at present, the survey showed that the proportion of dependents in Tien Luong commune is low accounting for under 10%, of which a significant proportion of the unemployed and semi-unemployment. The subjects included eat most students, students, and the rest are still small/elderly, lost labor and even are in working age, health but does not have a job. The project will increase the area of irrigated land, more seasonal produce in a year, diversifying outside the plantation industry (such as livestock, and professional services that use other countries); thereby increasing jobs and eliminate unemployment and underemployment present in the project area.

On the other hand, will have a significant negative impact on the livelihoods of households are relatively stable land recovered without implementing the mitigation measures to be effective in design, construction and compensation reasonable for the affected people can buy replacement land or a new job change. In terms of occupational rate contributing to the family income currently, the survey shows that the number of dependents is as high as 20%, of which there is a significant proportion of the unemployment and semi-unemployment. The dependents include pupils with the highest numbers, students, and the rest are young/elderly, those who are in labor health loss and even those in working age but unemployed. The project implementation will increase the area of irrigated land and seasonal crops per year, diversify the plantation (such as livestock, and other professional services that use water); thereby create more jobs and eliminate unemployment and underemployment in the project areas. On the other hand, there will have some significant negative impacts on households, whose livelihoods are relatively stable and whose land is acquired, if there are no effectively applied mitigation measures, reasonable construction and compensation for the affected people for them to buy another land or have a new job.

In general, for people living Tien Luong commune, the livelihood is mainly agriculture, commonly two rice crops and one secondary crop a year. Therefore, the safety of dams and water stability for irrigation is very important for agricultural production in the residential areas, while there is a high demand of water for agriculture activities in most surveyed areas but actually it is not proactive. In the entire commune, there are 9 hamlets which take water directly from Ban lake for production and a part of it is for daily use.

In actual qualitative surveys in the project area show that in the past there were some contradictions, conflicts between farmers, inequality of water supply amount because some households have more favourable conditions in receiving more water for their slots if they are at the upstream of the water resources. This is caused by the reservoir’s water loss. The repair and rehabilitation of reservoirs will address the lack of equality of water supply for the upstream and downstream.

**Land:** In Tien Luong, agriculture is the main production activities, the basic livelihood of the people, so that land is the main production resource of farmers. Of which, 89.5% HHs have residential land, 100% HHs have paddy land, 75.5% HHs have land for vegetables, 25.6% of HH have land to plant industrial trees and 15.3% of HHs have ponds and water surface.

The data of land of all types of surveyed households in the project area showed that agriculture and farming are popular in the localities. Therefore, the demand for irrigation for agriculture in these regions is very high, the lack of water in 1-2 months will certainly affect the lives of local people.

By income, the two lowest income groups (group 1, 2) have the rather high percentage of arable land types, thus we can see that they depend mostly on agriculture. It is obvious that the lack of arable land is now only one of the reasons causing poverty in agriculture area, rural areas, but the demand for water irrigation for cultivation land is important. For the purpose of reducing poverty, the stability and increasing of irrigated areas, increasing crops/ season/ year for the existing area as well as increasing activities of non-agricultural employment is very important.

<table>
<thead>
<tr>
<th>+Ethnic minority</th>
<th>5.0</th>
<th>54.2</th>
<th>10.5</th>
<th>4.5</th>
<th>2.5</th>
<th>8.6</th>
<th>6.5</th>
<th>8.2</th>
<th>0</th>
<th>0</th>
</tr>
</thead>
</table>
Table 4 - 9: Kinds of land of households(%) 

<table>
<thead>
<tr>
<th>Contents</th>
<th>Residential land</th>
<th>Paddy field area</th>
<th>Land for vegetables, secondary crops</th>
<th>Land for industrial trees</th>
<th>Ponds, surface water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>89,5</td>
<td>100</td>
<td>75,5</td>
<td>25,6</td>
<td>15,3</td>
</tr>
<tr>
<td>By commune</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tien Luong</td>
<td>89,5</td>
<td>100</td>
<td>75,5</td>
<td>25,6</td>
<td>15,3</td>
</tr>
<tr>
<td>By income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Group 1 (the poorest)</td>
<td>85,0</td>
<td>100,0</td>
<td>75,5</td>
<td>10,5</td>
<td>0,0</td>
</tr>
<tr>
<td>+ Group 2</td>
<td>90,0</td>
<td>100,0</td>
<td>62,3</td>
<td>19,2</td>
<td>6,4</td>
</tr>
<tr>
<td>+ Group 3</td>
<td>88,2</td>
<td>100,0</td>
<td>65,2</td>
<td>20,9</td>
<td>13,6</td>
</tr>
<tr>
<td>+ Group 4</td>
<td>80,5</td>
<td>100,0</td>
<td>63,2</td>
<td>20,2</td>
<td>17,5</td>
</tr>
<tr>
<td>+ Group 5 (the richest)</td>
<td>99,0</td>
<td>100,0</td>
<td>68,9</td>
<td>32,7</td>
<td>24,3</td>
</tr>
</tbody>
</table>

Characteristics of irrigation management: Currently, Ban reservoir is managed and operated by Tien Luong agricultural cooperative. This cooperatives manages all irrigation works and reservoirs in the commune. Ban reservoir is the largest work that the cooperatives in charge of.

The cooperative is inter-village scale, organizational structure of 7 people, Cooperative governing board has size of 3-5 people; DPC assigns business license for cooperatives; Cooperatives has an account, seal and is licensed to operate in the field of mining irrigation works and receive subsidies funding for irrigation charges.

Health Care

Tien Luong commune has 1 health center, 6 staffs and 7 beds. Health center primarily perform duties of initial health care, especially immunization for children and pregnant women, as well as distribution drug under insurance. There is 01 health care staff in every neighborhood. This staff is in charge of management, reporting problems related to primary health care. In the process of preparing and implementing the project, it is possible to call for support of health center for problems related to health.

There is about only 30.5% of surveyed households last month were ill. This is an average rate and this shows that the people in the commune receive rather good healthcare. There are no HIV / AIDS people in the region, and there are no people who earn money from prostitution.

Table 4 - 10: Health and health care conditions 

<table>
<thead>
<tr>
<th>Contents</th>
<th>With sick person in the past one month</th>
<th>With medical insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>By commune</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tien Luong</td>
<td>30,5</td>
<td>85,0</td>
</tr>
<tr>
<td>By ethnic minorities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Kinh</td>
<td>25,0</td>
<td>90,0</td>
</tr>
<tr>
<td>+ Ethnic minority</td>
<td>25,5</td>
<td>60,5</td>
</tr>
<tr>
<td>By income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1 (the poorest)</td>
<td>30,5</td>
<td>65,4</td>
</tr>
<tr>
<td>Group 2</td>
<td>25,1</td>
<td>76,0</td>
</tr>
<tr>
<td>Group 3</td>
<td>25,5</td>
<td>80,1</td>
</tr>
</tbody>
</table>
The number of surveyed households having insurances of all kinds is relatively high, accounting for 85.0%. In particular, the health insurance rate in the highest income group is at the highest of 95.5%. It is noteworthy that the number of surveyed households of Kinh group (90.0%) is lower than that of ethnic minorities (60.5%). The incidence of medical insurance in the highest income households (95.5%) is much higher than it of households with the lowest incomes (65.4%).

According to the respondents of surveyed households, in Tien Luong commune, there are four main reasons causing negative impacts on the health situation are listed as follows from the highest to lowest level, namely: polluted water, polluted areas, foods insecurity, and lacking of running water.

Two out of five important reasons adversely affecting people’s health and relating to water is the water source pollution (accounting for 25.8%) and lack of domestic water (accounting for 26.1%).

**Education**

There are 5 public schools, including one secondary school and 02 primary schools and 02 kindergartens in Tien Luong with a total of 560 secondary school students, 600 primary school students. Percentage of attendance of pupils is 100%. Repetition percentage of secondary school students is 0.1%.

About nearly 90.0% of the project population graduated from elementary school to college/university or higher, in which more than 63.3% people graduated from junior high school and high school. Only 17% people graduated from college/university or higher. The illiteracy rate is 1.0%. The rate of preschool people in communes of project areas is 8.0%, which is higher than the national average as stated in the Statistical Yearbook 2013 (6.0%). It is noteworthy that the rate of people graduated from college/university or higher is 17%.

The rate of illiteracy in ethnic minorities is higher than that of Kinh group (4.5% compared to 0.5%) and the pre-schooling rate (8.3% compared to 6.5%). According to the standard of living, the illiteracy rate in the poorest income group (group 1) is 2.5 times as much as the richest (2.5% compared to 0.0%) Percentage of children at the 6-18 age dropped out of school is 5.0%. This shows that the intellectual level of people in Tien Luong commune is average.

**Table 4 - 11: Education level of household members (Unit %)**

<table>
<thead>
<tr>
<th>Contents</th>
<th>Highest education level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Illiteracy</td>
</tr>
<tr>
<td>Total</td>
<td>0.5</td>
</tr>
<tr>
<td>By commune</td>
<td></td>
</tr>
<tr>
<td>Tien Luong</td>
<td>0.5</td>
</tr>
<tr>
<td>By ethnic minorities</td>
<td></td>
</tr>
<tr>
<td>+ Kinh</td>
<td>4.5</td>
</tr>
<tr>
<td>+ Ethnic minority</td>
<td>0.5</td>
</tr>
<tr>
<td>By income</td>
<td></td>
</tr>
<tr>
<td>Group 1 (the poorest)</td>
<td>2.5</td>
</tr>
<tr>
<td>Group 2</td>
<td>1.5</td>
</tr>
<tr>
<td>--------</td>
<td>-----</td>
</tr>
<tr>
<td>Group 3</td>
<td>1.3</td>
</tr>
<tr>
<td>Group 4</td>
<td>1.2</td>
</tr>
<tr>
<td>Group 5 (the richest)</td>
<td>0</td>
</tr>
</tbody>
</table>

Existing Infrastructure: In general, rural infrastructures in Tien Luong have not been developed. In addition to the main roads, communal roads are asphalt, many inter-village roads are still dirt roads, travelling is difficult, slipper and sliding during the rainy season, and dusty during dry season. Currently, the transportation system are connected to all communal areas (10 areas) in the commune

Electric grid has connected to all residential areas. All households in the commune are using electricity from national grid. In addition, there are also other technical infrastructure such as irrigation works in the commune

There is no welfare facilities, however, all zones have cultural center of the zone so that people can participate in meetings of community. The issues related to the project can be shared and discussed at the meeting at the cultural center.

Tangible and intangible cultural heritage: There is no areas of archaeological or cultural history. Only a few houses, pagodas and churches are located in the commune. This is the religious activities of the people and no work located near the project site within 2km or transportation of materials, construction waste road.

Religion and beliefs

In Tien Luong commune, only in area (zone 10) there are Christian people live (approximately 10% of population in zone 10). This area is about 6km away from Ban reservoir and no construction activities, transportation of material to go through the zone 10. According to the survey results, practical interview, religious and non-religious people live in harmony in the community and so far no conflict between social groups.

Gender and role of women

Gender activities are well implemented. There are not big gender inequalities in the community. Both men and women have the right to make decisions and participate in the family and community meetings. Women often do the farm work and housework, tidy the house. Men also do the same work, however, the time spent on household chores, taking care of the children of men are less likely than women about 2 hours / day.

The following are some gender issues relevant to the subproject:

- Labor and Labor division: Most of women are involved in agricultural activities. Women in mountainous areas encounter severe time constraints having to work much longer hours than men especially in the areas of land cultivation, transportation, family care, housework, etc. Women can work 9-10 hours/day while men only work for 8 hours/day). The limitation of knowledge, access to technology and use of traditional agriculture methods contribute to local people often facing high risks of bad crops, diseases for cattle and undernourishment.

- Access to education: All boys and girls have equal rights to go to school however the rate of attendance for girls is always lower than boys.

- Women’s Involvement in group activities: In subproject area, most women are Kinh women. Women do not know how and are not trained and empowered to express their rights in front of the community. Therefore, they have few opinions in the community meeting.

- Women’s participation in local government system: Through interviews with chairmen of commune PCs, it was recorded that women accounted for 35% within the Commune PC structure. No woman played a role as chairwoman of the Tien Luong CPC. Most women do not play leadership positions that influence the decision-making process.
- Health: Health conditions of women in Tien Luong commune is not serious. However, not only women but also the community has the high potential risks of contracting diseases such as diarrhoea, skin allergies and other forms of infection.

In general, women play an important role and position as men in family. They are involved in the decision making of the big things in their family. In society, women are actively engaged in social activities such as participating in the movement, local media activities. Besides, women also work in the unions, government agencies such as CPC, Clinics, and schools. According to CPC estimation, the rate of women in the government agency is about 30%.

Women and girls have the equal opportunities to access to the social services such as health, education, and entertainment. In the families, boys and girls have been treated as the same. However, there are still gender prejudice families, but that does not significantly affect the access to social services locally.

Other social service

Domestic water supply: Most of surveyed households in subproject area use water from dug/drilled wells for living purposes (95%), The rate of using other water sources is low: no household uses lake or river water, no household uses private faucet, 1.4% of surveyed households uses another water source and 3.6% of them uses rainfall.

<table>
<thead>
<tr>
<th>Communes</th>
<th>Private running water tap</th>
<th>Public water tap</th>
<th>Wells</th>
<th>Water from ponds, lakes</th>
<th>Rainwater</th>
<th>Others</th>
<th>Private running water tap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total samples</td>
<td>0.0</td>
<td>0.0</td>
<td>95.0</td>
<td>0.0</td>
<td>5.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>By commune</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tien Luong</td>
<td>0.0</td>
<td>0.0</td>
<td>95.0</td>
<td>0.0</td>
<td>5.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>By income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Group 1 (the poorest)</td>
<td>0.0</td>
<td>0.0</td>
<td>85.5</td>
<td>0.0</td>
<td>14.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>+ Group 2</td>
<td>0.0</td>
<td>0.0</td>
<td>93.7</td>
<td>0.0</td>
<td>7.3</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>+ Group 3</td>
<td>0.0</td>
<td>0.0</td>
<td>92.6</td>
<td>0.0</td>
<td>8.4</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>+ Group 4</td>
<td>0.0</td>
<td>0.0</td>
<td>95.1</td>
<td>0.0</td>
<td>4.9</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>+ Group 5 (the richest)</td>
<td>0.0</td>
<td>0.0</td>
<td>100</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Market and other services providing goods: Tien Luong has a temporary market, 500m from Ban reservoir. This market is opened every day in morning and afternoon, providing food and essential items for daily life.

Sanitation: There are more than 90% of households in surveyed area using sanitary latrines, including 62.5% of households using flush/semi-flush toilets, 27% of households use 2-compartment toilet. Just about 5% of surveyed households use the simple type toilet (digging in the garden, bridge on lakes, rivers and streams), and 2% of households have no toilet.

Garbage disposal collection: Among 10 zones of Tien Luong commune, garbage disposal collection service appears only in zone 4 and zone 5; the service is managed by community themselves. Domestic waste is collected in afternoon and transported to landfill for processing. In other zones, garbage is often collected and treated by household. The source of this garbage is buried or burned for processing.

Ethnic minorities

In Tien Luong commune, ethnic people account for 6.3% of population, mainly are Tay people (accounting for 2.5%), Cao Lan (1.7%), Dao (0.7%), and other ethnic groups account for 1.4%.
4.7 Past Incidences on the Dam and Management Responses

In 1996, outlet works intake was broken, causing water loss. Water regulation could not be operated. In that year, the works was fixed. The outlet works intake was removed back toward dam crest, 12 away from existing location. Outlet works intake repair was temporary solution, however, since then the outlet works intake has not been repaired anymore.

In 2003, flood spillway was broken causing severe damage, loss of people (1 death) and property. In 2003, local authority mobilized resources to backfill spillway threshold. Since then, the work has not been invested anymore.

To overcome the problems that happened in the history, the measures to repair and upgrade the outlet works intake and spillway should be implemented. Some measures should be done to overcome this problem as follows:

- Works must be executed according to plan and proposed measures;
- Comply with the provisions of the state on dam construction, reservoirs and dam safety;
- Lowering the reservoir water level to ensure the safety of the construction process;
- Make plans for incident prevention, mobilize governments and local people ready to respond when the incident occurs.
CHAPTER 5: IMPACT ASSESSMENT

5.1 Environmental and social impacts screening

The subproject underwent mandatory environmental and social screening as agreed with the World Bank, to among others, 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 an increase of the designed water storage capacity of the dam. 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 significant ethnic minorities and they account for 6.3% of population in Tien Luong commune. However, they generally do not live in cluster or communities but integrated with mainstream population and impacts caused by the project will affect overall community, but not particularly to an ethnic group. There are no graves, temples or any structure or sites with cultural, religious or historical significance in the subproject area. Due to urbanization, there are no more pristine forest, critical natural habitat, or protected natural areas within 20 km radius of the construction site. There are no rare plants and animal species that need to be preserved.

Based on the screening the following instruments are required:

- Resettlement Action Plan/Compensation Plan (RAP)
- Chance Find Procedure
- Grievance Redress Mechanism Procedure

5.2 Positive Impacts

The following are the positive impacts of the subproject:

1. Improved agricultural productivity and farmers income. The subproject will improve agricultural productivity as irrigation water will become stable and more reliable due to increased efficiency of the reservoir after the repair. This will lead also to increased incomes of farming households.

2. Improved safety. The dam will be strengthened and is better able to withstand severe weather events. The structure will also be safer for the downstream communities and their assets.

3. Operation of the reservoir will provide habitat to aquatic and terrestrial species. The reservoir will improved humidity, water table and soil moisture around the reservoir area creating stable habitat to many plant and animal species and promoting biodiversity.

4. Improved dam safety awareness of local communities. The construction activities along with public consultation activities, meeting and participation in the construction and installation activities of the local government and PMU will raise awareness of local people and local governments on reservoir and dam safety.

5. Increase opportunities to improve the livelihoods of local people: Construction contractors will hire local workers for jobs on work site; purchasing, use of goods and services locally. This positive impact is small and temporary because:

- Direct recruitment of local labor will create livelihoods for the people
- The presence of workers will increase demand for local services, creating opportunities for small businesses and service providers especially for food and entertainment, house rentals, laundry, transportation and other petty services.

Because of this, contractors are encouraged to use local labor in the construction process to perform tasks such as digging, collecting waste and materials, cutting trees. Similarly, women, those who are vulnerable will be given priority to be employed by the contractor to improve their income
5.3 Negative Impacts

**Short-term Negative Impacts and Issues**

Most of the short-term impacts are due to the construction activities. These impacts are temporary and localized and their magnitude will depend on the scale of the construction activities involved.

*Temporary increase in sedimentation and turbidity of the reservoir and the downstream channel.* The subproject will require excavation of 6,400 cubic meters of soil materials which will be mostly utilized for backfilling, only less than 100 cubic meters will be disposed. The impact is assessed to be low because the amount of earthmoving is relatively small and will be undertaken during the dry season. The construction of the new intake, the spillway and the repair of the upstream face and foundation of the dam is expected to generate localized sedimentation and turbidity to the reservoir. In the absence of runoff and release of water through the spillway, very little sedimentation and turbidity, if any, is expected to find its way to the receiving channel and Gianh River.

*Dusts nuisance within the construction site and along construction routes.* Dust are likely to be generated as the construction activities will be carried out during the dry season. The dust are expected to be generated mostly from the construction traffic during the transport of construction materials. Excavation works at the dam and at the burrow pit will generate minimal dust as excavated soil are expected to be moist. In general, the amount of dust generated would depend on the quality of the road and the frequency of trips. Hence the impact will be felt mainly in the rural earth roads. Since the soil transport requirement is minimal (less than 100 cubic meters) construction traffic around the rural roads will not be heavy. The dust impact is therefore assessed to be low.

*Increase in noise levels within the construction site:* Noise and vibration will come from the operation of heavy equipment at the construction site. Noise could be significant within 50 meter distance from the source. Beyond 50 meters noise from equipment will not pose any hazard. Therefore noise will be a hazard only to construction workers. Noise however could be a nuisance to residents if they are generated during rest hours. Location prone to the impact will include construction sites located in zone 3, 4, 5 in Tien Luong commune; material transportation road from national road no. 32 to the construction site, 5 km long, waste material transportation road passing zone 3, 1.6 km long. The number of equipment operating at the construction site at the peak of construction estimated to be about 10 only. This impact is negligible.

*Possible interruption in water supply during the repair works.* The construction at the dam will be done during the dry season when water level is low. Release of water if any will be minimal as the water level would have already reached near the dead level at +26.67. This will be done through the existing intake. If construction will be done during periods of high water, a cofferdam will be constructed around the construction section so as to minimize water interruption. However, there is one household who is renting the reservoir for aquaculture production. The effect on the livelihood of this household is insignificant because the lowest water level after being drained is still at +26.67 m which is sufficient for the fish to live.

*Possible damage of existing roadways due to heavy equipment traffic.* As embankment materials transport is minimal, traffic of heavy equipment would be light. Still rural roads could be damaged by heavy equipment. The contractor is expected to comply with the maximum load limit of of trucks at 7 tons as well as maximum speed of 30km/h when passing inter-commune roads is a standard requirement. Still some damage is likely and the contractor should be required to undertake repair as necessary.

*Construction wastewater:* Construction wastewater from the stone grinding and screening station, stone washing places, building materials yards, concrete mixing plants, concrete placement area contains cement, sand, though few but very dense. Without centralized processing before discharge, it may increase turbidity and water pollution caused by alkaline from concrete. According to calculations of design consultants, volume of effluent approximately 1m3/day, the load of pollutants during construction. The pollution load from this rate of discharge is calculated in Table 5-2. These pollution load are not significant.

**Table 5 - 1: Load of pollutants in construction wastewater**
### Pollutant Load Calculation

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Norm (mg/l)</th>
<th>Pollutant load (kg)/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>COD</td>
<td>625</td>
<td>0.3375</td>
</tr>
<tr>
<td>BOD&lt;sub&gt;5&lt;/sub&gt;</td>
<td>303</td>
<td>0.1636</td>
</tr>
<tr>
<td>SS</td>
<td>6,800</td>
<td>3.672</td>
</tr>
<tr>
<td>Grease</td>
<td>44</td>
<td>0.2376</td>
</tr>
</tbody>
</table>

(Source: Document of Economopoulos, WHO, Genève 1993)

**Domestic wastewater from workers camp.** During peak period of construction phase, there will be 50 workers, but are scattered in four work items. Domestic wastewater is generated from the personal chores such as cooking, eating, personal hygiene. According to national regulation TCXDVN 33:2006 for region of Yen Son district – a mountainous district, average volume of water for domestic purpose is 80 liters/day/person. The amount of wastewater is equal to 80% volume of domestic water, so that it will produce 64 liters of waste water per day. With number of 50 workers, volume of waste generating every day is of about 3,200 liters/day, equivalent to 3.2 m cu.m/day or a total of 1,168 cu.m. The amount of domestic wastes (i.e. wastewater and solid waste from a maximum of 50 workers) will not be significant but these would require standard containment (i.e. septic tank, soak pit), collection and disposal (i.e. solid wastes to the landfill).

**Domestic solid waste of workers.** Domestic waste from the camps without proper management and sanitary treatment will generate pollution and nuisance such as odors and vermin infestation. The number of workers at peak period of construction time of 50 people. Impact of domestic waste of workers in each construction area on the environment is similar. Assuming the average waste amount discharged by a worker one day is of about 0.3 - 0.5 kg, total waste discharged by 50 people during this period of about 15-25 kg/day. These waste will have high organic matter content (about 60-70%, other components including paper, plastic, packaging, etc. During the 12 months construction period, the total cumulative solid waste would be about 6 tons. This is not expected to be a source of significant pollution and should be easily handled by existing waste collection and disposal system in the area.

**Solid wastes from construction.** Solid waste from construction activities will include trees and vegetation removed from the construction sites. Useful portions of these wastes such as wood will be utilized by the community. The unusable portions will be disposed to the municipal landfill or to a designated area to be determined during construction. The other solid waste will include excess soil materials. Based on the calculations, the total amount of soil to be disposed is 99 m3. At the same time, construction process will also generate solid waste in the form of concrete, bricks, debris, etc. The estimated amount of debris is 5-7 kg / day. These wastes will be disposed into the designated landfill area which will be levelled and returned to the Commune after construction. The land acquisition is only temporary (12 months). As per agreement with CPC, the contractor will plant trees on land area for landfill and restore the landscape. The impact is assessed at low level.

**Hazardous solid waste.** The scale of construction is relatively small and the works do not require use of hazardous chemical or materials. Hazardous waste generated will be limited to waste oil, discarded batteries, oil rags, fluorescent bulbs. Waste oil is mainly generated from the machinery maintenance and repair facilities. The average amount of waste oil generated is 18 liters/vehicle x 4 times/years. With around 10 vehicles operating, amount of oil discharged during construction time will be about 720 liters in one year. Although relatively in small quantities, these items, if not collected and disposed of properly will be a source of environmental pollution and contamination of soil and water environment. The risk of contamination of the site from hazardous wastes is considered low but still would need to be address.

**Gaseous Emissions.** Diesel powered equipment will emit gaseous pollutants such as SO<sub>2</sub>, CO<sub>2</sub>, CO, NO<sub>x</sub>, VOC, etc. This kind of air pollution depends on number of construction vehicles, machinery and methods of construction. As estimated, there are only about 6 construction trucks travelling on road every day and a few operating at the construction site. The impact of these emissions to the air quality in the area is negligible.
**Increased health and safety risks among local residents:** Workers and local residents will be exposed to construction hazards including vehicular traffic on small roads. The hauling of construction materials will use the road connecting national road no. 32 to the construction site. This road has a length of about 5km, passing through zone 4 and zone 5 in Tien Luong commune. The population density is low hence risk of traffic accidents is low. Other hazards would include accidents at the construction site due to excavation, obstruction or loss of traditional passageways or loss of barrier fences to dangerous areas in the reservoir. Workers are exposed to accident hazards in operating the machineries, digging and filling process or transporting materials. Both workers and residents will also be exposed to health hazards due to possible unsanitary condition at the workers camp and exposure to infectious diseases such as HIV/Aids and waterborne diseases such as malaria and dengue as workers and community residents interact. However, the risk is assessed to be medium level due to the following:

- Number of construction machinery is few, about 6 device/day
- Much activities will be carried out manually such as pottering material, etc. Thus, risk of accident will be reduced.
- Construction activities are mostly undertaken in the dry season, accident is also reduced.
- There will only be a few workers and many of them will be hired locally; and,
- Construction site is far from residential areas at least 300 meters.

The impact will occur in Tien Luong commune, mainly in the Zone 4 and Zone 5 which is closest to the construction site and is along the transport route for construction materials and waste.

**Possible conflict between workers and local residents.** Construction workers from other places will bring in new culture and may clash with local culture. Petty conflicts may also arise as a result of daily contacts of residents and outsiders. Migrant workers are expected to comply with the provisions of the law on public administration and demographic management.

**Impacts on biology.** The construction activities will be confined mostly within the reservoir headworks area. The impacts to the biological environment would be limited to the removal of the vegetation that have overgrown on the dam slopes. As mentioned earlier trees and other vegetation have grown on the dam slopes (both upstream and downstream slopes). The trees are mostly bamboo, jackfruit, banana and some shrubs. The area has become the nesting place of some birds, rodents and insects. These vegetation will be cleared and the animals living within the dam slope will be affected. The small animals and insects are expected to migrate to nearby areas. In terms of the aquatic flora and fauna (i.e those found in the reservoir and downstream channel) the construction may have some small impact in terms of increased turbidity which minimal as discussed earlier. Impacts due to alteration of hydrological flow during construction, will be minimal as the construction will release water only through the intake which should be within the normal hydrological flow.

**Long Term Negative Impacts and Issues**

The following are long term negative impacts, expected to be felt beyond the completion of the subproject.

**Loss of land, trees and crops.** The area of land to be used in subproject implementation is of 1.24 hectares in Tien Luong commune, Cam Khe district. Of which, the subproject permanently acquired 0.67 hectares of land which is currently used as garden land, residential lands, irrigation land, other agricultural land; about 0.57 ha of public land mainly vacant and crops lands managed by Commune People's Committee for construction purposes Based on the survey, no household will be relocated due to land acquisition. The lands acquisition are vacancies land, garden land, production forest land, other agricultural land. The crops to be affected consists of 4,535 trees, including eucalyptus, apples, guavas, grapefruits, starfruits, Litchi, longan, mango, etc.

**Land and soil degradation.** The construction could leave behind an ugly landscape of highly degraded land, unsuitable for agriculture production or other uses. This could happen to lands used for temporary purposes such as worker’s camp, temporary easements for the road construction, the landfill and materials yard area due to loss of vegetation, alteration of landscape due to excavation, structures, construction spoils, litters and wastes. The burrow pit on the hillside and the landfill area will be
particularly affected but also the materials yard as well as the workers camp. This impact is significant and would need to be addressed.

**Long term impact of the subproject on the hydrology and ecology of the reservoir and receiving water channel.** The proposed rehabilitation works will not alter the hydrologic regime of the reservoir and the receiving channel. It will merely strengthen the existing dam structures to improve safety. During construction, there will be no release of the water as the spillway crest is fixed, and it has no control gate. Any release of water would be through the outlet works intake which flows into the irrigation canal systems before draining into the downstream river.

**Increased use of pesticides.** The improved irrigation water supply is also expected to promote intensive agricultural production in the service area which may result in increase use of pesticide in the long term.

**Other issues**

1. **Lack of grievance redress.** There will likely be complaints against the subproject, damage compensation claims, or allegations of unfair treatment. These are issues workers from other regions need to comply with the provisions of the law on administrative and demographics management. It is the job of the basic management levels of the locals and the Management Board of the work to avoid regretful social conflicts that may arise.

2. **Chance archaeological finds.** The excavation activities could chance upon archaeological artifacts or rare paleontological fossils.

3. **Unexploded ordinance.** The construction may encounter unexploded ordnance left from the war. Construction areas that have been cleared for unexploded ordnance before should secure UXO clearance.

4. **Cross-cutting gender issues.** The benefits may accrue differently between gender groups. Likewise, the negative impacts/costs may unfair be borne by one gender group.

**5.4 Significant Negative Impacts and Issues**

Based on the above assessments, the significant negative impacts and issues that would need to be mitigated or addressed are as follows:

- Temporary increase in sedimentation and turbidity of the reservoir and the downstream channel
- Possible damage of existing roadways due to heavy equipment traffic.
- Increased health and safety risks among local residents due to exposure to construction hazards
- Possible conflict between workers and local residents
- Loss of land, trees and crops by some households due to land acquisitions
- Possible land and soil degradation at construction sites due to construction litters and land deformation
- Increased use of pesticides due to intensification of agricultural production in the area
- Possible complaints and damage claims against the subproject may arise during construction
- Possible chance find of archaeological artifacts in the excavation sites
- Possible encounter with unexploded ordnance
- Cross-cutting gender issues
PART 6
ALTERNATIVE ANALYSIS

6.1 No Action Alternative

The main purpose of the sub-project is to ensure safety for the people living in downstream areas of the dam, to stable irrigative to 150 ha agriculture land at Tien Luong commune, modernization operational management, improve ecology systems condition and freshwater aquatic cultivation combination.

Ban Irrigation reservoir was built and used since 39 years ago, it brings high economic efficiency to the local resident and improve social conditions. To date, the headwork of the construction was damaged and degraded. Without the sub-project, the risk of dam failure is dramatically increase, and it will impact to 150 ha agriculture land of owned by 1280 households living in Tien Luong commune, as well as damage all the infrastructures, civil and industry facilities in the region. Thus, the sub-project is relatively effect to upgrade and improve the existing conditions of the dam. In the long term period, it will bring more efficiency to the local resident by reducing the risk of dam failure and its appurtenant structures, improve the efficiency of the exploitation of reservoir and water resources sustainable development in the regional.

6.2 With Project Implementation Alternative

Repairing outlet works intake

Parameters after repairing: Outlet works intake is 35m long, is steel encased concrete M200, diameter $\Phi 600mm$, design $Q = 0.23 m^3/s$.

Construction, repairing, upgrading activities: Build new outlet works intake, 5m away from the old one, on the right side of dam C. No land is acquired.

Impact assessment: The project is upgraded based on the current condition and will not change flow. In Dam C, intake will be constructed next to the old one. Construction activities will not affect water taking from the current outlet works intake. Thus, water supply for downstream area is not affected. Moreover, upgrading the intake at dam C will take place during time without use of water from Ban reservoir (February to May). Thus, water supply for downstream will not be affected.

The intake construction will affect water quality in the reservoir due to the dismantling, oil dropping during installation of equipment.

However the impact is low and temporary because:

- Construction of outlet works intake is carried out in dry season and cofferdam will be developed if necessary. Thus, scope of impact on water supply is very low.
- Construction schedule will be informed to people so that they can make plan for production, living.
- Time to drain water is properly selected, prevent time required to take water for crop in downstream

Location: Ban reservoir, outlet works intake, downstream area

Period: 3 months (February to May)

Upgrading upstream and downstream slope of the dam

Construction, repairing, upgrading activities: Dam A: move heart line of the dams 4m toward upstream; Dam B, dam C: move heart line of the dam 4.5m toward upstream; Treat seepage on upstream slope; concrete placement on dam surface and upstream slope, plant grass and equip drainage facilities on downstream slope.

Impact assessment: On upstream slope, there are many plants encroaching into the reservoir (figure 5-1, appendix 10), including timber trees and fruit trees such as bead tree, mango tree, guava tree, etc. It is inhabited by some insects such as mites, crickets, beetles, etc. When the project to upgrade and repair dam is taken place, especially upgrading the dam roof, vegetation growing on two dam slopes will be cleaned, the animals living within the dam slope will be affected. However, small animals can move to other areas, in the garden of households or vacant land with vegetation having similar characteristics to
live. Besides, there is fish cage farming in reservoir. The cleanup, site clearance generating noise will affect the fish being farmed in cage, since position of the cage close to the upstream slope of dam. However, area and amount of cut trees is low, this impact is insignificant. Dam slope and spillway construction process may cause erosion on dam body or nearby location.

However, this effect is LOW and TEMPORARY because the repairing activities for dam slope and spillway will be carried out in the dry season. The location of construction is located above the water level. Moreover, dam base is built with cement; it is difficult to cause soil erosion.

Location: Ban reservoir, upstream and downstream of the dam

Period: 12 month construction

Upgrading spillway

Construction, repairing, upgrading activities: Spillway is located on the left side of dam A, next to the existing dam, 5m away from the existing one toward dam B, as surveyed route of TR2; TR3; Repairing, upgrading flood spillway with stone M150 coated by reinforced concrete M200 20cm thick; chute is reinforced concrete M200, 20m long. slope i=34.22%; width B = 10 m. It is free spillway threshold, with stilling basin, design flood discharge flow: Qmax1.5% = 27.13 m$^3$/s

Impact assessment: There are about 10ha of aquaculture ponds and land for crops planting behind the spillway. Construction of the spillway may increase turbidity of water supplied for those areas and cause economic loss to HHs. This risk and impact is low, because: Location of the spillway is now 1.5m higher than the dead water level, while excavation and ground leveling for construction of the spillway is still over the dead water level. Thus, there is no risk of water pouring into the ponds. Ponds behind the spillway are linked together and play role as seamless flow. Thus, if water flows into these pond, this water volume will continuously flow to Gianh stream (drainage canal of downstream area). Therefore, the impact is insignificant.

Spillway construction process may cause erosion on dam body or nearby location. However, this effect is LOW and TEMPORARY because: The repairing activities for dam slope and spillway will be carried out in the dry season. The location of construction is located above the water level. Moreover, dam base is built with cement; it is difficult to cause soil erosion.

Location: Dam A, Ban reservoir

Period: 12 month of construction (mainly in 3 months of spillway construction)

Repairing, construction management road

Parameters after repairing: Concrete road, length L = 1430m, 3m wide of road surface, concrete M250, 22cm thick, beneath the concrete layer is sand layer 3 cm thick and 15cm thick macadam.

Construction, repairing, upgrading activities: Upgrade, repair management road connecting to the dam, cut slope.

Impact assessment: The road running along the reservoir is earth road, relatively steep, width of road surface of 3m - 4. The road passes through zone 3, Tien Luong commune. The road will be temporarily used when the dam under construction. Material transport will also use this road to release pressure on the main road. Recognized vegetation along the road is mainly bushes, shrubs and some common timber trees such as acacia and bead tree. Acquired land area for construction of management road estimated of 11,500 m$^2$ is garden land and vacant land. Affected trees are fruit trees (grapefruit, star fruit, etc.) and crops with low value, not rare vegetation. Construction period may impact local travel, transportation, as well as the risk of accidents:

Increase risk of accidents due to the increase of the means through inter-commune roads and construction sites (where the excavation activities are carried out, and where the construction equipment, waste locates on or next to roads, works, etc.). It may danger local people, especially at night when visibility is limited; and suspended dust particles reduces visibility;

The construction of the dam and ancillary works such as management road will limit the ability of people to travel as well as access to social infrastructure such as schools, markets, etc.
However, these effects are LOW and TEMPORARY because:

- Volume of construction means will be shared, release pressure for the main road. Transportation of construction materials will use road connecting national road no. 32 to the work, length of about 5km, which is the current road often used passing through the sparsely populated areas of zone 4 and zone 5. At the same time, management road 1,600 m long along the reservoir in the East, being earth road, will be utilized. The demand for low traffic on the route, in addition, the reduction of traffic load for the main road contributes to the ability to obstruct traffic is very low.

- The number of vehicles/equipment for road construction is about 6 trucks per day during the peak construction period is negligible

A part within scope of the contractor is to ensure the health and safety on construction sites for individuals and construction site; it is not allowed to occur the risk to the safety of people. Therefore, the contractor shall take measures to minimize the impact during construction process

**Location:** Dam A, B, C, spillway, management road and road to transport material and waste in Tien Luong commune

**Period:** 12 months of construction phase
CHAPTER 7: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

This Environmental and Social Management Plan (ESMP) identifies the measures needed to mitigate the impacts associated with the subproject and provides the means for their implementation, including budget, responsibilities and capacity building within the project organization. The ESMP also includes an arrangement for compliance and environmental quality monitoring and audit.

7.1 Mitigation Plan

Based on the assessments in Chapter 5, the following impacts and issues are significant and hence would need to be mitigated/adressed:

- Temporary increase in sedimentation and turbidity of the reservoir and the downstream channel
- Possible damage of existing roadways due to heavy equipment traffic. Hazardous solid waste generation
- Increased health and safety risks among local residents due to exposure to construction hazards
- Possible conflict between workers and local residents
- Loss of land, trees and crops by some households due to land acquisitions
- Possible land and soil degradation at construction sites due to construction litters and land deformation
- Long term impact of the subproject on the hydrology and ecology of the reservoir and receiving water channel
- Increased use of pesticides due to intensification of agricultural production in the area
- Possible complaints and damage claims against the subproject may arise during construction
- Possible chance find of archaeological artifacts in the excavation sites
- Possible encounter with unexploded ordnance
- Cross-cutting gender issues

Table 7-1 below identifies the feasible measures, cost estimate of the implementation and responsibilities.

## Table 7-1. Impacts, mitigation measure and responsible unit

<table>
<thead>
<tr>
<th>Impacts/Issues</th>
<th>Mitigation Measures</th>
<th>Responsible Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Temporary increase in sedimentation and turbidity of the reservoir and the downstream channel</td>
<td>Level off and compact disposed soils immediately at the landfill site; Protect or carefully place stockpiles of soil and sand away from runoff; Discharge construction wastewater away from the reservoir and downstream channel</td>
<td>Contractor under Supervision of PMU through CSC</td>
</tr>
<tr>
<td>2. Possible damage of existing roadways due to heavy equipment traffic. Hazardous solid waste generation</td>
<td>Require the contractor as part of the contract to inspect the routes and undertake necessary detours or repairs before the start of construction; Require the contractor as part of the contract to undertake repair as necessary on</td>
<td>PMU and local reservoir management</td>
</tr>
<tr>
<td>Impacts/Issues</td>
<td>Mitigation Measures</td>
<td>Responsible Unit</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>the construction routes and restore the road to original state upon completion of works</td>
<td></td>
<td>Contractor to CEO-HSP to be approved by PMU and CPO</td>
</tr>
</tbody>
</table>
| 3. Increased health and safety risks among local residents due to exposure to construction hazards | Include in the CEO-HSP, the following measures:  
(1) Use of PPE at construction site;  
(2) Provision of safe temporary passageway/detours for local residents, particularly across the spillway during its construction;  
(3) Provision of barrier fences and warning signs in deep excavations and portions of the dam construction with deep water;  
(4) Impose speed limits in the neighborhood in Tien Luong particularly in Zone 4 and 5.  
(5) Undertake medical screening of workers.                                         | Contractor to CEO-HSP to be approved by PMU and CPO                                                 |
| 4. Possible conflict between workers and local residents                        | Contractor to implement a simple community relations plan in coordination with local authorities                                                                                                                      | PMU and local reservoir management                                                                     |
| 5. Loss of land, trees and crops by some households due to land acquisitions     | Implement the RAP/Compensation Plan. Under the RAP 15 households who will lose lands and crops will be compensated and supported in their livelihood.                                                               | PMU and as specified in the RAP                                                                       |
| 6. Possible land and soil degradation at construction sites due to construction litters and land deformation | Requiring the contractor to practice good housekeeping (sorting, storing of materials, segregation of wastes) and good collection and disposal of construction litters and wastes;  
Requiring the contractor to restore construction site, including the agreed levelling and landscaping of the landfill site. | CPO and PMU                                                                                           |
| 7. Increased use of pesticides due to intensification of agricultural production in the area | Introduce and promote IPM approach in the irrigation service area                                                                                                                                             | MARD, DARD                                                                                           |
| 8. Possible complaints and damage claims against the subprrproject may arise during construction | Adopt and set up a Grievance Redress Mechanism that would allow resolution of conflict and complaints at the lowest possible level                                                                                             | PMU, local reservoir management and Contractor                                                         |
| 9. Possible chance find of archaeological artifacts in the excavation sites     | Adopt the DRSIP Chance Find Procedure                                                                                                                                                                            | PMU, local reservoir management and contractor                                                         |
| 10. Possible encounter with unexploded ordnance                                  | Undertake UXO clearance if necessary. Adoption of the UXO procedure.                                                                                                                                              | PMU, local reservoir management and contractor                                                         |
As indicated in the table above, the ESMP also requires the adoption/implementation of the various other safeguards instruments which have been prepared for the sub-project. These include:

- Gender Development Plan
- Grievance Redress Mechanism Procedure
- Chance Find Procedure; and,
- Unexploded Ordnance Procedure

In addition, since the impacts and issues during construction are mostly the responsibility of the contractor, it is recommended that as part of the general measures (in the ESMP), MARD should require the winning contractor to prepare and submit their own Contractors Environmental and Occupational Health and Safety Plan which is based on the measures identified in the ESMP and the standard practices of the construction industry, including wearing of PPE, proper waste disposal, installation of barriers, fences and warning signs, other good housekeeping practices, and strict compliance with national regulations on hazardous waste management. The CEOHSP should be reviewed and approved by MARD before any construction can commence.

7.2 Monitoring Plan

**Compliance Monitoring.** The monitoring will focus on compliance monitoring for ESMP and the CEOHSP. This will be done by the project owner, represented by the Reservoir Management or a hired Construction Supervisor Consultant on a daily basis as part of the ground supervision of construction. The instrument to be used in the Compliance Monitoring is the ESMP matrix itself with added column on Status as follows.

<table>
<thead>
<tr>
<th>Impact/Issues</th>
<th>Mitigation measure description as described in the ESMP</th>
<th>Status of implementation</th>
<th>Next steps or Agreed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Similar instruments should be developed for the CEO-HSP.

**Environmental Quality Monitoring.** The Environmental Quality Monitoring will focus only on parameters that have relevance to the subproject impacts and issues. Table 7.2 lists the parameters to be monitored and the frequency of collection.

<table>
<thead>
<tr>
<th>Monitoring Objective</th>
<th>Monitoring Parameters</th>
<th>Method</th>
<th>Monitoring Frequency</th>
<th>Resource required and responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring the water quality changes in the reservoir and receiving channels</td>
<td>pH, DO, BOD\textsubscript{5}, \text{NH}\textsubscript{4}\textsuperscript{+}, TSS, Turbidity (NTU)</td>
<td>Field survey and measure Analysis in the laboratory</td>
<td>2 times/year up to the end of the first year after completion</td>
<td>QCVN 08:2008/ BTNMT Responsibility: PPMU, EMC</td>
</tr>
</tbody>
</table>
EMC is Environmental Management Consultant hired by PMU.

**Monitoring of community**: The local community supervision Board has been established according to “Decision No.80/2005/QĐ-CP dated 18/04/2005 of Prime Minister on investment supervision statutes of community”. The community supervision Board of commune has right and responsibility for supervising construction activities, negative impacts to environment caused by construction activities and guarantees the measures to minimize potential adverse impacts have been implemented effectively by contractor. In case there arise environmental problems that affect to community, they will alert groundSubproject Construction Supervision Consultant and/or PPMU.

### 7.3 Institutional Arrangement and Capacity Building

**Institutional Arrangement**: The Ministry of Agriculture and Rural Development (MARD) - Central Project Office (CPO) will be responsible for the overall supervision of subproject, including the implementation of the ESMP. The Phu Tho Provincial Department of Agriculture and Rural Development (DARD)/Provincial Project Management Unit (PPMU) through the local reservoir management will be responsible for contract management and ground supervision of the implementation of the ESMP including the CEOHSP. The project owner PPMU will submit a quarterly compliance monitoring report to the CPO (See Section 7.2). The CPO will in turn, if it deemed necessary, conduct validation of the report through site inspections/audits of the subproject. The Phu Tho Department of Natural Resources and Environment (DoNRE) will also undertake their own monitoring and audit of the sub-project in accordance with their mandate under the Law of Environment Protection. Likewise, the local Community Supervision Board created under Decision 80/2005 will undertake their own supervision of the environmental compliance of the subproject based on their own mandate.

**Capacity Building**: The various subproject units, including representative from the contractor, will undergo short 1-2 day seminar courses to build their capacity in implementing the in environmental management plan. Table 7.3 below lists the proposed trainings to be conducted.

#### Table 7.3: Proposed training program on environmental and social safeguards

<table>
<thead>
<tr>
<th>No.</th>
<th>Contents</th>
<th>Implementation budget (VND)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Environmental and Social Safeguards Policies of the World Bank and the DRSIP Environmental and Social Management Framework.</td>
<td>1 course * 30 participant = 30 Mill.</td>
</tr>
<tr>
<td>2</td>
<td>Familiarization of the ESMP, RAP and various Safeguards Instruments of the Song Quao Subproject</td>
<td>1 course * 50 participant = 50 Mill.</td>
</tr>
<tr>
<td>2</td>
<td>Environmental Compliance Auditing and Monitoring</td>
<td>1 course * 50 participant = 50 Mill.</td>
</tr>
<tr>
<td>4</td>
<td>Training on environmental health and safety measures</td>
<td>2 course * 100 participant x 50 Mill./course = 100 Mill.</td>
</tr>
<tr>
<td>5</td>
<td>Training on improving of gender equity</td>
<td>2 course * 100 participant x 50 Mill./course = 100 Mill.</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>VND 330,000,000</strong></td>
</tr>
</tbody>
</table>

### 7.4 Budget

The proposed budget of the implementation of the ESMP, including monitoring and capacity building is summarized in Table 7.4 below.

#### Table 7.4 Cost Estimate

<table>
<thead>
<tr>
<th>Item</th>
<th>Budget (million VND)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMSP Implementation, including cost of RAP implementation</td>
<td>TBD</td>
</tr>
<tr>
<td>Monitoring Cost</td>
<td>TBD</td>
</tr>
<tr>
<td>Capacity Building Cost</td>
<td>330,000</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Total</td>
<td>TBD</td>
</tr>
</tbody>
</table>

*TBD=To be determined during finalization of the detailed engineering and during bidding preparation.

CHAPTER 8: CONSULTATION AND INFORMATION DISCLOSURE

8.1 Coverage
- Commune People’s Committee
- Fatherland Front Board
- Organizations (Farmer association, Woman association and Youth Union)
- Leaders of hamlet
- The affected household in project area

8.2 Social Impact Assessment Consultation
The consultation attendance:
- Commune People’s committee
- The affected households

The consultation’s content:
- Introducing the content, main works of subproject, source of capital for implementation;
- The consultant presents the policies in interests of the affected people, grievance mechanism and solution, compensation policy for each type of land, architectural works and plants, farm produce
- The consultant presents impacts forecast of subproject to resettlement, gender;
- The stakeholders discuss policies in interests and compensation to the effects on land, works, architecture, plants and farm produce.

Consultation method:
Immediately starting project preparation, local authorities leadership at all levels of Tien Luong commune, Cam Khe district, Phu Tho province have been reported about the subproject, the targets and proposed activities of project. The affected households had been invited to consultation meeting was held in commune office to discuss the related contents.

<table>
<thead>
<tr>
<th>Participated commune</th>
<th>Location</th>
<th>Time</th>
<th>The number of participated people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tien Luong</td>
<td>Tien Luong CPC</td>
<td>29/1/2015</td>
<td>30</td>
</tr>
</tbody>
</table>

During the consultation process, there are a lot of ideas of stakeholders have been discussed broadly and freely as concluded as follows:
- The affected land area by subproject mainly is farmland.
- The land acquisition of Phu Tho subproject is very few since the upgrading and repair based in the former line; therefore the adverse impacts can be minimized and land acquisition scale is insignificant.
- The construction and upgrade project’s works in order to improve dam safety stabilize life for local people.
The affected households desire to be provided information and implementation progress of subproject.

The affected households want to be compensated adequately and manifestly according to the replaceable price for damaged assets and the market price for temporary affected farming products.

Both male and female participate in local organizations and propose ideas relate to subproject; hence the gender issue has been ensured.

There is no ethnic minority living in the project area in Tien Luong commune. For this result there is no negative impact to ethnic minority.

Woman merchandising situation does not occur in the project area.

The affected people understand positive and negative impacts of subproject to local; therefore, they get fully unanimity with the project development and they hope the subproject will be deployed soon.

8.3 Environmental Impact Assessment Consultation

Consultation attenders:

- Commune People’s Committee
- Fatherland Front Board
- Organizations (Farmer association, Woman association and Youth Union)
- Leaders of hamlet
- The affected household in project area

The consultation’s contents:

- Introducing the contents and main components of subproject, project budget
- The consultant presents potential impacts of subproject to environment and society,
- The consultant presents environmental and social management plan includes: the mitigation measures and implementation schedule
- Consulting environmental problems and historical environmental and social impacts
- Stakeholders discuss the measures to minimize the environmental and social impacts
- Commune People’s Committee and Fatherland Front Board have written ideas

Consultation measures:

Arrange the meeting with the above participant includes: local authorities, local organizations, and affected people. To create condition for the local people express their opinions, aspirations, the consultation meeting to be held expansively and under questionnaire in status and consequence of happened natural calamity phenomenon in there having expression aspiration and requirement of interviewed organization or individual with subproject.

Consultation results:

Table 8 - 2: The number and the component of participants and consultation before implementing the project

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Number of participants</th>
<th>Component of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>25/1/2015</td>
<td>Phu Tho Province DARD</td>
<td>11</td>
<td>Phu Tho Province DARD, Department of Natural Resources and Environment, Department of Construction, Department of Transportation, Department of Culture, Department of Health, Department of Education</td>
</tr>
</tbody>
</table>
Table 8 - 3: Consultation’s content

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Consultation’s content</th>
<th>Responsibility for implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>25/1/2015</td>
<td>Phu Tho Province DARD</td>
<td>- Introduce the content, the main items of the project, and performing funds</td>
<td>Phu Tho PMU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Introduce the require of environmental and social impact assessment of WB</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Introduce the environmental and social safeguard policies activating in the project</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Discussion opinion of the related sectors, such as the consensus on the project, the positive and negative effects that may occur when implementing projects and the proposals of the mitigation measures of the environmental and social impacts to investors</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Consult the incident happened in history (after the construction of the reservoir) and its impacts on the environment and society</td>
<td></td>
</tr>
<tr>
<td>29/1/2015</td>
<td>Tien Luong CPC</td>
<td>- Introduce the content, the main items of the project, and performing funds</td>
<td>Safeguard policies consultants.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Consultant showed the forecast of the environmental and social impacts of the project</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Consultant showed the ESMP including the mitigation measures and performing plan.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Consult the environmental incident that has happened in history and its impacts on the environment and society.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Community discussed the measures to minimize the impact on the environment and social.</td>
<td></td>
</tr>
</tbody>
</table>

Summary of feedbacks received from the public consultation process of preparing esia:

Table 8 - 4: Summary of consultations

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Feedback/Arising problems</th>
<th>Responsibility of the owner</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-1-2015</td>
<td>Phu Tho MARD</td>
<td>Most of departments and units supported the project and look forward the project will implement early. Expect the PMU and contractor execute the project with high quality</td>
<td>Timely update implementation of the project, especially during difficult period</td>
<td>Timely update implementation of the project, especially during difficult period</td>
</tr>
<tr>
<td>Date</td>
<td>Location</td>
<td>Feedback/Arising problems</td>
<td>Responsibility of the owner</td>
<td>Proposed mitigation measures</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>29/1/2015</td>
<td>Tien Luong CPC</td>
<td>The project will affect the work and life of the people. The implementation of the project should be met the schedule. Project implementation procedure will be complied strictly from the investment plan to construction activities. Implementation of environmental and social impacts assessment for the Project is very serious. There are environmental pollution issues caused by the project but with insignificant scale. Recommend Project owner to publicize information about Project, so that CPC can conduct community supervision. Long-term objectives of the Project in comparison with temporary impacts during construction period is very huge. During construction process, especially transportation process, the contractor should apply measure to avoid material falling on road and damage the road. Upon detection of the illegal problems or occurring accident, people will communicate with the investor and local authority. On security issues, people recommended investors to closely coordinate with the CPC to manage a team of employees working in the construction process. Avoid transporting materials and activities arising noise during rush hour.</td>
<td>Will provide information on the progress of project implementation, and coordination with local monitoring contractor in compliance with measures to minimize the social and environmental impact, and ensure work quality.</td>
<td>Several solutions proposed by community are:  - Limiting construction activities in rainy season  - Construction activities should be undertaken from February to May in order not to face conflict on water demand  - Operation of overloaded trucks can damage roads social will be restricted.  - Contractors shall declare temporary residence of workers coming to the commune  - Watering the road with lots of dust generated by the trucks along road and in densely populated areas</td>
</tr>
</tbody>
</table>
ESIA Disclosure

According to WB’s policy on approaching information, ESIA draft documents of subproject have been announced widely at the local, websites of WB and these documents have been displayed at the easy view positions, succinct and easily understandable edit.
REFERENCES

1. Summary report of social economic situation in 2014 of Tien Luong commune
2. Summary report in 2014 of the woman union of Tien Luong commune
3. Summary report in 2014 of the Health station of Tien Luong commune
4. Summary report in 2014 of the Farmers Union of Tien Luong commune
5. Summary report in 2014 of the Agricultural Cooperatives of Tien Luong commune
7. Summary report in 2014 of Phu Tho department of agriculture and rural development
8. Statistical Yearbook 2014 in Phu Tho province
9. New rural scheme of Tien Luong commune from 2015 to 2020
10. Feasibility study report (FS) of Repair and improvement of Ban reservoir, Tien Luong commune, Cam Khe district.
APPENDICES

APPENDIX A – ENVIRONMENT

Appendix A1 - DRAWINGS OF THE MAIN WORKS
Cắt=E Regional
Appendix A2 - TYPES OF MAP

MAP OF PROJECT LOCATION

OUTLINE OF SAMPLING AND ENVIRONMENTAL OBSERVATION POSITIONS
THE POSITION OF DISPOSAL, MATERIAL ACQUIRERMENT AND BORROW PITS
Appendix A3- POLICY FRAMEWORK, INSTITUTIONS AND REGULATION

Legal framework related to environmental protection

- Law on Environmental Protection 2014, No. 55/2014/QH13 regulating the issues related to Strategic Environmental Impact Assessment and commitment of Environmental protection for development activities. EIA report must be prepared during investment preparation process (feasibility study);
- Decree No. 18/2015/ND-CP dated 14/02/2015 regulating plan for environment protection, strategic environmental impact assessment, EIA and planning for environmental protection;
- Direction No. 26/CT-TTg dated 25/8/2014 of Prime Minister on implementing the Law on Environmental Protection;
- Circular No.01/2012/TT-BTNMT dated 16/3/2012 of MONRE regulating preparation, approval and monitoring, identifying the implementation of the detailed environmental protection project; preparation and registration of the simple environmental protection project;
- Decree No. 29/2011/ND-CP dated 18/04/2011 regulating strategic environmental assessment, EIA and environmental protection commitment;
- Circular No.16/2009/TT-BTNMT dated 17/10/2009 of MONRE on Regulation and Technical Standard on environment, air quality and some toxics in around air;

Legal framework related to land use and land acquisition of the investment projects

- Decree No.44/2014/ND-CP, dated 15/05/2014 regulating the land price;
- Decree No. 47/2014/ND-CP, dated 15/05/2014 regulating the compensation, support and resettlement in cases of the land recovered;
- Decree No. 37/2014/ND-CP, dated 30/06/2014 regulating in details about the compensation, support and resettlement in cases of the land recovered;
- Circular No. 23/2014/TT-BTNMT dated 19/5/2014 regulating the Certificate of Land use right, House ownership and other assets attached.

Legal framework related to the use and management of the investment projects

- Law on Construction No. 50/2014/QH13 approved by Vietnam National Assembly dated 18/08/2014;
- Decree No. 15/2013/ND-CP dated 06/02/2013 on managing the construction quality;
- Decree No. 207/2013/NĐ-CP dated 11/12/2013 on revising and supplement some Articles of Decree No. 48/2010/NĐ-CP dated 07/5/2010 of Government on the contract in construction activities;

Legal framework related to integrated water resources exploitation and forest protection, cultural heritage and biodiversity

- Law on Water Resources approved by Vietnam National Assembly dated 21/06/2012;
- Decree No.42/2012/ND-CP, dated 11/05/2012 of Government on managing and using of rice land;
- Decree No. 112/2008/ND-CP dated 20/10/2008 of Government on managing, protecting and integrated exploitation of water resources and environment of the electrical generation and irrigation reservoirs;
- Decree No. 120/2008/ND-CP dated 01/12/2008 of Government on River Basin management;
- Decree No. 72/2007/ND-CP dated 07/05/2007 of Government on Dam safety management;
- Decree No. 149/2004/ND-CP dated 27/07/2004 of Government regulating the licensing of exploration, exploitation and use of water resources and waste water discharge into water resources;
- Law on Culture Heritage No.28/2001/QH10 approved by Vietnam National Assembly dated 12/07/2001. Article 13 - Strictly prohibit the following acts: Appropriating and distorting the cultural heritage; destroying or risk destruction of cultural heritage; Unauthorized excavation of archaeological sites; illegal construction, encroachment of land belonging to historical – cultural and scenic areas;

**National Policy on Dam safety**

- Decree No. 72/ND-CP dated 07/02 /2007 on managing Dam safety;
- Government Direction No. 21/CT-TTg dated 14/10/2013 on enhancing the management of reservoir safety;
- Circular No. 33/2008/TT-BNN dated 04/02/2008 on guiding the implementation of some Articles of Decree No. 72/ND-CP;
- Document №1852/BNN-TCTL dated10/06/2014ofthe Minister ofAgricultureandRural Development on supporting the urgentrepairfunding to ensure the safety ofreservoirs;

**Resettlement policy**

- Decree No. 44/2014/ND-CP dated 15/5/2014 regulating the Land price assessment.
- Decree No. 47/2014/ND-CP dated 15/5/2014 on compensation and resettlement in cases of land recovered.
- Decree No. 75/2012/ND-CP dated 03/10/2012 on guiding the implementation of the Law on Complaints.
- Decree No. 42/2012/ND-CP dated 11/05/2012 on managing and use of rice land;
- Circular No.37/2014/TT-BTNMT dated 30/6/2014 regulating compensation, support and resettlement in cases of land recovered.
- Decree No. 197/2004/ND-CP of Government dated 03/12/2004 on compensation, support and resettlement in cases of land recovered.
- Decree No.188/2004/ND-CP of Government on the methods of determining land price and land price frame for each type of land.
- Circular No. 114/2004/TT-BTC, dated 16/11/2004 guiding the implementation of Decree No. 188/2004/ND-CP.
- Decree No.17/2006/ND-CP of Government dated 27/01/2006 on revising and supplement some Articles of Decree guiding the implementation of Law on Land and Decree No. 187/2004/NĐ on the transformation of state companies into joint stock companies.
- Decree No. 84/2007/ND-CP of Government dated 25/05/2007 regulating the supplements of issuing the Land use rights Certificate, procedures of compensation and resettlement in cases of land recovered.
- Decision No. 52/2012/QD-TTg of Government dated 16/11/2012 on support policy of employment and career training for labors who have land recovered.

Under the guidance of Phu Tho province on implementing next steps and completing the Resettlement Action Plan in accordance with current regulations which is a basis for compensation and site clearance for the project. The policies of Phu Tho province for preparing Resettlement Action Plan is based on the following legal documents:

- Decision № 13/2011/QD-UBND dated 17/7/2011 on revising Article 28 and Article 30 about the prices of project compensation of the decision № 1467/2011/QD – UBND.
- Decision № 40/2013/QD-UBND dated 20/12/2013 on issuing the regulation of prices of land types in Phu Tho province in the year 2014.
- Decision No 3139/QD-UBND dated 6/10/2011 on issuing the unit price for compensation of crops in Phu Tho province.

And other legal documents related to compensation, support and resettlement of Phu Tho province.

**Gender policy**

- Decree No. 70/2008/NĐ-CP dated 4/6/2008 of Government regulating in detail on implementation of on Gender Equality;
- Circular No. 191/2009/TB-BTC dated 1/10/2009 of Ministry of Finance guiding the use and management of funds for gender equality and women advancement;
- Circular No. 07/2011/TB-BTP dated 31/3/2011 of Ministry of Justice guiding the gender equality ensure in staff arrangement and legal support activities;
- Decision No. 2351/QD-TTg dated 24/12/2010 of Prime Minister approving the National Strategy on Gender Equality for 2011 – 2020 period.

**Policy for Ethnic Minority community development**

- Decree No. 82/2010/ND-CP dated 20/7/2010 of Government on teaching and learning the ethnic language in the schools.
- Decree No. 60/2008/ND-CP dated 9/6/2008 of Government regulating the functions, tasks, responsibilities and organization structures of Ethnic Committee.
- Decree No. 70/2001/ND-CP: all registration documents of family assets and land use rights must be filled the names of both husband and wife.
- Decision No. 03/2005/QD-BNN dated 07/01/2005 of Minister of MARD regulation the wood exploitation to support house construction of the poor and difficult ethnic households in line with Decision No. 134/QD-TTg dated 20/7/2004 of Government.
- Decision No. 33/2007/QD-TTg, dated 05/3/2007 of Government on the support policy on immigration and settlement for ethnic minorities;
- Decision No. 1592/QD-TTg dated 12/10/2009 of Government on continuing implementation of some policies to support productive land, residential land, house and domestic water for the poor and difficult ethnic households.
- Decision No. 05/2007/QD-UBDT dated 06/9/2007 of Ethnic Committee approving three Ethnic Minority regions and mountainous region based on the development situation.
- Circular No. 06 dated 20/9/2007 of Ethnic Committee guiding the support services for livelihood improvement of local people, technical assistant to improve knowledge on Law enforcement in line with Decision No. 112/2007/QD-TTg.

**Poverty reduction policy**

- Decision No. 33/2007/QD-TTg dated 20/7/2007 of Prime Minister on the support policy to improve knowledge of Law enforcement within 135 program- phase 2.
- Resolution No. 30a/2008/NQ-CP of Government dated 27/12/2008 on the support program for rapid and sustainable poverty reduction for 61 poorest districts.

**National Regulations and Standards related to environmental protection**

(i) Water Environment:
- NTR 08:2008/BTNMT: National technical standard on surface water quality;
- NTR 09:2008/BTNMT: National Technical Standard on ground water quality;
(ii) Air Environment:
- NTR 05:2013/ BTNMT - National Technical Standard on around air quality;
- NTR 07:2008/BTNMT: air quality - levelsoftoxic substancesin the air
- TCVN 6438:2001: Vehiclesfrom the road-the maximumlimit of gases emission

(iii) Land Environment
- NTR 03 : 2008/BTNMT - National Technical Standard on permitted limitation of heavy metals in the soil;
- NTR 04 : 2008/BTNMT – National Technical Standard on residue of chemical and pesticide in the soil;

(iv) Solid waste management:

(v) Vibration and noise:
- NTR 26:2010/BTNMT – National Technical Standard on the noise;

(vi) Health and labor safety
Decision N°3733/2002/QD-BYT of the Ministry of Health dated 10/10/2002 on the application of the 21 standards of health and safety that relates to microclimate, noise, and vibration chemicals-the allowed threshold in the workplace.
Circular 146/2007/TT-BQP: 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
### Appendix A4: ENVIRONMENTAL AND SOCIAL SCREENING

<table>
<thead>
<tr>
<th>Screening questions</th>
<th>Yes</th>
<th>No</th>
<th>Description of impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Does the subproject have potential to cause significant adverse impacts on natural environment or important natural environment?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Loss or degradation of land and water areas where (i) has the native species, and (ii) human activity has not significantly alter the fundamental ecological functions of the project area.</td>
<td>✓</td>
<td></td>
<td>Subproject implementation will acquire land of 15 HHs with total areas of 26,000 m² for construction, repair of dam A, B, C, spillway and management road. Affected trees area acacia, trash timber, diameter less than 5cm. No effect on indigenous species.</td>
</tr>
<tr>
<td>- Loss or degradation of natural habitats such as: important conservation areas, areas protected by traditional local communities (e.g. sacred forest), biodiversity; rare, vulnerable, migratory or endangered species.</td>
<td>✓</td>
<td></td>
<td>Repair and upgrading is taken place in area around head-work area of Ban reservoir, including existing spillway, dam, and outlet works intake and management road. All work items are located in zone 3, Tien Luong commune, which is agricultural production area, there is no sensitively environmental area, such as: conservation areas, areas protected by traditional local communities. Permanently affected area of 15,000m² is vacant land, garden land. No natural living environment on land. Besides, auxiliary works serving for construction such as landfill, material yard, workers’ camp, and construction site will occupy temporarily 1,1ha of land area in zone 3 and zone 4, zone 5 in Tien Luong. The land is mainly vacant land. They are not sensitively environmental areas.</td>
</tr>
<tr>
<td>2. Does the subproject have the potential to cause significant adverse impacts on physical cultural resources?</td>
<td></td>
<td></td>
<td>There is no impact to the material culture resource, because the subproject is taken place based on existing construction. Moreover, there is no property or structure relating to archeology, religion, and aesthetics in Tien Luong commune. The nearest residential area is about 200m from the work site, in zone 3.</td>
</tr>
<tr>
<td>Loss or degradation of the material culture resource, structures, groups of structures, characteristics, natural landscape with importance of archaeology, paleontology, history, architecture, religion, aesthetic, or other importance of culture.</td>
<td>✓</td>
<td></td>
<td>The project is undertaken for Ban reservoir, which was built in 1976. There is no report in on heritage, scientific value property. The implementation of project strictly complies with framework of national legislation and international obligations under treaties and relevant international environmental conventions.</td>
</tr>
<tr>
<td>- May result to conflict with national law or international obligations under treaties and relating international environmental agreements, including the World Heritage Convention of UNESCO or affect to the famous, scientific and important heritage worth in tourist</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Does the sub-project have potential to cause significant adverse impacts on land and related natural resources by the use of ethnic minorities?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
May result to impacts on land or traditionally owned territory, or used or customary tenure, and where access to natural resources, which is vital for the sustainability of the culture and livelihood of ethnic minorities. Likely to lead to impact on cultural and spiritual values symbolized for the land and natural resources or impact on management of natural resources and the long-term sustainability of resources affected.

As described above, zone 3 in Tien Luong commune where upgraded, repaired works area located is agricultural area, majority of population is Kinh people. There is no land areas, and related natural resources used by ethnic minorities. Acquired land areas include permanent acquired land area – 15,000m², temporarily acquired land – 11,000m², are vacant land (permanent) and public land (temporary), and does not face to any objection of people during consultation and information disclosure process. No any ethnic HH among the AHs. Access of AHs is assured through an resettlement action plan, while other infrastructures are not affected.
The project does not use the lands or territories under traditional ownership, used or possessed customarily.

### 4. Does subproject have potential to cause significant adverse impacts on displaced population?

| Result to the displacement of people or land acquisition, property affecting their lives and difficulty in restoring livelihoods | The project does not cause relocation effect. Land acquisition of garden land, vacant land of HHs living along the upstream slope of the dam with total area of 1,5 ha may affect planting fruit trees, vegetable in garden of HH. However, 15 AHs have main income source from agriculture, production tool is the area of agricultural land are not affected. Therefore, the impact from the loss of land to the people is slight. |

### 5. Does subproject require construction of a large dam?

| Does the subproject require construction of a large dam? | The largest height of dam of Ban reservoir is 11m. Design of the dam is simple. The dam does not belong to a large dam. |
| Does the subproject require construction of a large dam: | |
| - Height of 15 meters or more | ✓ |
| - 10 to 15 meters high, with intricate designs. | ✓ |
| - Less than 10 meters high, but is expected to become the largest dam in the operation phase of the sub-projects? | |

| The operation of the subproject depends on the efficiency of: | Water from reservoir is used mainly for agricultural purpose and partly for living purpose. Flood spillway is now earth spillway. Downstream of the spillway is not reinforced, many eroded holes in the downstream. Threshold has been filled up to the height of approximately current elevation of dam crest. Thus, the spillway no longer has function to drain floodwater. Before rainy season, local people discharge excess water through outlet works intake. Implementation of the subproject will enhance capacity, ensure the safety of the dam and the people living downstream dam. |
| - Existing dam or dam under construction | ✓ |
| - Power station or water supply system gets water directly from the reservoir by a large dam or under control of a constructed dam. | ✓ |
| - Diversion dam or hydraulic structure in downstream from an existing dam or dams | ✓ |
under construction, where every incident of upstream dam can cause enormous harm or damage to architectural and irrigation projects or water supply projects funded by the WB, the project is dependent on the capacity and performance of an existing large dam or dam being constructed to provide water and could not function if the dam was broken.

<table>
<thead>
<tr>
<th>6. Does the subproject lead to procurement or use of pesticides?</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does formula of the product fall into IA and IB classification of WHO, or any formula of type II?</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>The purchase or use of pesticides is not in the investment portfolio of the subproject.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. Does subproject have potential to cause irreversible effect or impact not easy to mitigate?</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead to loss of regional recharge aquifers, affecting to quality of water storage and water storage areas responsible for providing drinking water to large population centers.</td>
<td>There is no river in Tien Luong commune, but Gianh stream crossing with length of about 5.5km; water volume is relatively plentiful. Water is transferred from Ban reservoir to Gianh stream to irrigate for alluvial lands outside the dyke in dry season using steel pipe diameter D=250mm, after being repaired and upgraded. The construction and upgrading of project categories is focused in headwork area of Ban reservoir, on a small temporarily acquired land area, will not affect to quality of water storage areas. Temporary land use for construction including land for construction site, camp, site operation house, materials yard has total area of about 11,000m² located along management route, in the bare lands. Moreover, the majority of the population in the project area (95%) use centralized water supply for living and drinking purpose, so it is not likely to affect containing water area for drinking water supply to residential areas.</td>
</tr>
<tr>
<td>Lead to any impact occurring in relatively long period, affecting to large geographical area or intense impact.</td>
<td>Construction of the subproject will not last long, only 12 months. The construction activities including upgrading, repairing is calculated done in the dry season, the influence of water to benefit area during construction almost did not happen. The reservoir will be repaired to ensure the safety of the people behind the dam and provides stable, effective steps contributing to community economic development.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. Does the subproject have potential to lead to a wide variety of significant adverse effects?</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many construction sites in various locations are affected, each impact cause loss of</td>
<td>Land area acquired for construction of head-works is of 11,500m². Land acquisition process will remove</td>
</tr>
</tbody>
</table>
| **habitat, natural resources, land or significant depletion of resources quality.** | ✓ | **topsoil cover, cut trees, which may affect to soil, air environment, and vegetation cover.**  
- Construction of 1,600m management road will permanently acquire land area of 3,500m². Construction activities will arise noise, emission polluting environment and affecting traveling of people.  
Construction of auxiliary works will temporarily acquire 11,000m² of land area (from which: landfill – 3,000m², bypass – 3,000m² and workers’ camp, material yard, operation house – 5,000m²). Particularly, land for landfill with area of about 3,000m² is agreed by Tien Luong CPC to select the vacant land along the road leading to the reservoir. Presence with activities of workers will generate wastewater, domestic solid waste affecting living environment.  
Construction activities area taken place during a not too long period (12 months) and within a narrow space, thus, there is no significant impact on living environment, natural resources, soil or impact significantly declining on resources quality.  
The significant potential adverse effects capable to expand beyond the construction site or works. | ✓ | **Construction activities will increase demand of using the existing road connecting national road no. 32 to the dam crest. Generation of dust spreading outside scope of the construction site may happen. The road may also be damaged by activities of large loaded vehicles. However, it happens just in narrow scope. Construction The project area is rural area with plentiful vegetation cover, so that dust and emission is easy to be diluted.**  
- Construction of management road will acquire vacant land, garden land with area of 1,500 m².  
- At peak period of construction, there may be 50 workers concentrating in construction site, from them 30% (15-20 workers) come from other localities. It may result in increase of food demand in the commune, increase of pressure on local health care service. Conflict between workers and local people may arise. | ✓ | **The subproject is implemented entirely in the territory of Vietnam. There is no impact across border.**  
There is no waterway activities in project area. | ✓ | **Construction of bypass crossing dam A will temporarily acquire about 3,000m² of vacant land area during bridge over the spillway construction time for travelling demand. Besides, current management road is earth road, slipper in rainy season will be invested, upgraded to become concrete road, length of 1600 m, contributing to improve travelling condition of people.** |
Beside, construction activities will not affect other infrastructures.

<table>
<thead>
<tr>
<th>Interrupt the cycle of migration of wildlife, wild animal or grazing animal, nomads or semi-nomads</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>The subproject is carried out in zone 3, Tien Luong commune, Cam Khe district, is habitat of people. No kind of wildlife is detected at all, there are only grazing animals such as buffalo, cows, etc. The construction of subproject will not disrupt the cycle of migration of wildlife, wild animal. There is no nomad or semi-nomad living in project area</td>
<td></td>
</tr>
</tbody>
</table>

9. **The subproject does not have precedent work, does it?**

<table>
<thead>
<tr>
<th>No precedent at national level?</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>There have been many similar projects to be implemented</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No precedent at provincial level?</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>There have been many reservoirs in Phu Tho province to be repaired, upgraded</td>
<td></td>
</tr>
</tbody>
</table>

10. **Is subproject controversial and likely to attract the attention of NGOs and national or international social organizations?**

<table>
<thead>
<tr>
<th>Considered as risk and likely to have special controversial aspects</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities under project scope include only repair, upgrading of reservoir serving for production of local people and there is no negative impact to other areas.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>May lead to protests of those who wish to express or prevent construction.</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultation results showed that both the government and the people fully agreed and supported implementation of subproject.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix A5: SAMPLE POSITION

KÝ HIỆU MẪU

NƯỚC MẶT: 🍽️
NƯỚC NGÂM: 🍽️
BÙN DÁY: 🍽️
ĐẤT: 🍽️
# KẾT QUẢ PHÂN TÍCH MÀU NƯỚC MẶT

**Dự án:** Chí ươm, núng cự Hà Bàn
**Địa điểm:** Xã Tiến Lượng – huyện Cẩm Khê – tỉnh Phú Thọ
**Người ghi mẫu:** Dương Thị Kim Thúy
**Đơn vị ghi mẫu:** Phòng Kế hoạch Tài chính
**Ngày ghi mẫu:** 09/02/2015

Kết quả phân tích được thể hiện trong bảng sau:

<table>
<thead>
<tr>
<th>TT</th>
<th>Chỉ tiêu</th>
<th>Đơn vị</th>
<th>Mẫu NM1</th>
<th>Mẫu NM2</th>
<th>Mẫu NM3</th>
<th>QCVN 08:2008 (A2)</th>
<th>QCVN 08:2008 (B1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>pH</td>
<td></td>
<td>6.9</td>
<td>7.1</td>
<td>6.8</td>
<td>6-8,5</td>
<td>5,3-9</td>
</tr>
<tr>
<td>2</td>
<td>Độc tố</td>
<td>NTU</td>
<td>55</td>
<td>67</td>
<td>65</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>TSS</td>
<td>mg/l</td>
<td>25</td>
<td>28</td>
<td>27</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>DO</td>
<td>mg/l</td>
<td>7.0</td>
<td>6.8</td>
<td>7.2</td>
<td>≥5</td>
<td>≥4</td>
</tr>
<tr>
<td>5</td>
<td>BOD5</td>
<td>mg/l</td>
<td>5</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>COD</td>
<td>mg/l</td>
<td>11</td>
<td>10</td>
<td>15</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>Pb</td>
<td>mg/l</td>
<td>0,0015</td>
<td>0,0040</td>
<td>0,0022</td>
<td>0,02</td>
<td>0,001</td>
</tr>
<tr>
<td>8</td>
<td>Hg</td>
<td>mg/l</td>
<td>KPH</td>
<td>KPH</td>
<td>KPH</td>
<td>0,001</td>
<td>0,001</td>
</tr>
<tr>
<td>9</td>
<td>As</td>
<td>mg/l</td>
<td>0,0021</td>
<td>0,0043</td>
<td>0,0020</td>
<td>0,02</td>
<td>0,03</td>
</tr>
<tr>
<td>10</td>
<td>Fe</td>
<td>mg/l</td>
<td>0,32</td>
<td>0,56</td>
<td>0,80</td>
<td>1</td>
<td>1,5</td>
</tr>
<tr>
<td>11</td>
<td>Coliform</td>
<td>MPN/100ml</td>
<td>2400</td>
<td>4100</td>
<td>3500</td>
<td>5000</td>
<td>7,500</td>
</tr>
<tr>
<td>12</td>
<td>E.coli</td>
<td>MPN/100ml</td>
<td>18</td>
<td>54</td>
<td>34</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

Ghi chú: KPH – Không phát hiện

T/M niêm phán tích: Phạm Trường Phong

Lê Văn Cự
KẾT QUẢ PHÂN TÍCH MẪU NUÔC NGĂM

Đề án: Cải tạo, nâng cấp hồ Ban
Địa điểm: Xã Tiền Lương – huyện Cẩm Khê – tỉnh Phú Thọ
Người giao mẫu: Dương Thị Kim Thùy
Đơn vị giao mẫu: Phòng Kế hoạch Tài chính
Ngày giao mẫu: 09/02/2015

Kết quả phân tích được thể hiện trong bảng sau:

<table>
<thead>
<tr>
<th>TT</th>
<th>Chỉ tiêu</th>
<th>Đơn vị</th>
<th>Mẫu NN1</th>
<th>Mẫu NN2</th>
<th>Mẫu NN3</th>
<th>QCVN 09:2008</th>
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<tbody>
<tr>
<td>1</td>
<td>pH</td>
<td>-</td>
<td>7,1</td>
<td>6,8</td>
<td>6,7</td>
<td>5,5–8,5</td>
</tr>
<tr>
<td>2</td>
<td>Đô cung tổng số</td>
<td>mg/l</td>
<td>205</td>
<td>275</td>
<td>335</td>
<td>500</td>
</tr>
<tr>
<td>3</td>
<td>Chất rắn tổng số</td>
<td>mg/l</td>
<td>89</td>
<td>55</td>
<td>66</td>
<td>1500</td>
</tr>
<tr>
<td>4</td>
<td>DO</td>
<td>mg/l</td>
<td>6,6</td>
<td>6,5</td>
<td>7,0</td>
<td>–</td>
</tr>
<tr>
<td>5</td>
<td>COD</td>
<td>mg/l</td>
<td>11</td>
<td>15</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Cd</td>
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<td>KPH</td>
<td>KPH</td>
<td>KPH</td>
<td>0,005</td>
</tr>
<tr>
<td>7</td>
<td>Pb</td>
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<td>0,002</td>
<td>0,002</td>
<td>0,004</td>
<td>0,01</td>
</tr>
<tr>
<td>8</td>
<td>Hg</td>
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<td>KPH</td>
<td>KPH</td>
<td>KPH</td>
<td>0,001</td>
</tr>
<tr>
<td>9</td>
<td>As</td>
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<td>0,0034</td>
<td>0,0020</td>
<td>0,0018</td>
<td>0,05</td>
</tr>
<tr>
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<td>Fe</td>
<td>mg/l</td>
<td>20</td>
<td>18</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>Ecoli</td>
<td>MPN/100ml</td>
<td>KPH</td>
<td>KPH</td>
<td>KPH</td>
<td>KPH</td>
</tr>
<tr>
<td>12</td>
<td>Coliform</td>
<td>MPN/100ml</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Ghi chú: KPH – Không phát hiện

T/M nhóm phân tích

Trưởng phòng

Hà Nội, ngày tháng năm 2015
Viện Nuóc, Trụ sở tại và MT

Lê Văn Cử
KẾT QUẢ PHÂN TÍCH MẪU ĐẤT

<table>
<thead>
<tr>
<th>TT</th>
<th>Chỉ tiêu</th>
<th>Đơn vị</th>
<th>Mẫu D1</th>
<th>Mẫu D2</th>
<th>Mẫu D3</th>
<th>QCVN 03:2008 (Đất NN)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Cu</td>
<td>mg/kg đất khô</td>
<td>5</td>
<td>9</td>
<td>9</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>Pb</td>
<td>mg/kg đất khô</td>
<td>10</td>
<td>12</td>
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<td>Zn</td>
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T/M nhóm phân tích

Lê Văn Cử

Trưởng phòng

Hà Nội, Ngày tháng năm 2015
Viện Nước, Trái đất và Môi trường

PHÓ VIỆN TRƯỞNG

Vì Quốc Chinh
Picture of sampling and field work

Surface water sampling

Ground water sampling

Soil sampling
CONG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

PHI. THÒ........ Ngày 29 tháng 1 năm 2015

BIỂN BẢN LÀM VIỆC

Công trình:-CN tuân và bạn

Hôm nay, ngày 29 tháng 1 năm 2015, tại X. Tiếng Hãy...

Cán bộ, Phú Thọ... chúng tôi gồm;

I. Đối diện: UBND xã...

- Ông/Bà: Nguyễn Văn Sơn, chức vụ: Phú Thị.
- Ông/Bà: Trần Văn, chức vụ: Phú Thị.

đã làm việc với:

II. Đối diện: Đơn vị tư vấn đánh giá tác động Môi trường

- Ông/Bà: Dương Thanh Kim, khối: Chức vụ: TP. LQ, huy: TP.
- Ông/Bà: Phan Thị Hằng, khối: Chức vụ: Chuyên gia KM, LQ.

Nội dung làm việc:

Sau khi đọc lại biên bản, những người có mặt đồng ý về nội dung biên bản, không có ý kiến gì khác hoặc có ý kiến bổ sung khác (nếu có) như sau:

UBND xã, cùng ban, ban, nhân... để... huy, phân... huấn... giáo, học, giáo, học, giáo, học, giáo, học, giáo, học, giáo, học...

Sau khi đọc lại biên bản, những người có mặt đồng ý về nội dung biên bản, không có ý kiến gì khác hoặc có ý kiến bổ sung khác (nếu có) như sau:

UBND xã, cùng ban, ban, nhân... để... huy, phân... huấn... giáo, học, giáo, học, giáo, học, giáo, học, giáo, học...

Xác nhận của UBND

Người giữ chức: Phú Thị

Đơn vị tư vấn

Duong Thanh Kim
CÔNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

Phú Thọ

Ngày 29 tháng 1 năm 2015

BIÊN BAN HỢP THAM VÀN CỘNG ĐỒNG
Về các vấn đề môi trường

Công trình: Cái Thò, xã Phù Lông

Xã: Phù Lông, huyện An Khê, tỉnh Phú Thọ

Hôm nay, ngày 21 tháng 1 năm 2014, tại xã Phù Lông, huyện An Khê, tỉnh Phú Thọ,

chúng tôi gồm:

I. Thành phần tham dự

- Ông/Bà Nguyễn Văn Phúc
- Ông/Bà Lê Thị Phư
- Ông/Bà Nguyễn Thị Hằng
- Ông/Bà Đỗ Văn Kim Phúc
- Ông/Bà Phù Thị Hằng

- Đại diện những người bị ảnh hưởng: …….. người (chỉ tính xem Danh sách tham dự cuộc họp)

II. Nội dung tham vấn

1. Cần bố giải thích về địa điểm, quay mờ, các thông số kỹ thuật cơ bản và những tác động Dự án được xây dựng tại địa phương mang lại.

2. Cần bố tư vấn trình bày những chính sách môi trường của chính phủ Việt Nam, chính sách môi trường của Dự án và đánh giá tác động môi trường tiềm năng của dự án bao gồm các tác động đến môi trường tự nhiên và xã hội của khu vực dự án; biện pháp phòng ngừa, giảm thiểu các tác động tiêu cực và phòng ngừa, ứng phó sự cố môi trường. Qua đó để xuất chương trình quản lý và giám sát môi trường

III. Y kiến thảo luận

1. Các tác động:

Để cơ sở xung đột cơ sở xung đột giữa địa phương và xã hội nên

Kế hoạch, tổ chức, quản lý và theo dõi, kiểm tra
2. Những đối tượng bị ảnh hưởng
- Nông dân, lao động quy định, người dân
- Những người có công
- Chủ quyền anh, phụ nữ, công dân tộc thiểu số
- Những người có quan hệ

3. Đề xuất biện pháp giảm thiểu:
- Sóc, nước, khí, khí, vật liệu, nhiệt độ
- Hệ thống các chi tiết, vật liệu, khí, nước, nhiệt độ
- Trang bị, thiết bị, vật liệu, khí, nước, nhiệt độ
- Thanh niên, thiếu niên, người dân

IV. Kết luận
- UBND xã, huyện, tổ chức thực hiện các biện pháp, giải quyết
- Những vấn đề về việc
- Những thực hiện

Cưỡng hợp các bên thống nhất và kết thúc vào lúc:...giờ........ngày...23...tháng.1......năm 2015

Đại diện Chủ đầu tư  Đại diện cộng đồng  Đại diện UBND xã

Phó trưởng BAN
Nguyễn Anh Hằng

Đại diện Mật trận Tổ quốc xã  Cán bộ tham vấn  Đại diện đơn vị tư vấn

Lê Đại Nghi  Phù Thị Hằng  Nguyễn Thị Kim Ngân
CÔNG HOẢ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

BIÊN BẢN XÁC NHẬN BÁI KHAI THẠC VẬT LIỆU DẤT DẢP
Công trình: 
Xã: 
Hôm nay, ngày 29 tháng 1 năm 2015, tại Xã 

I. Đại diện đơn vị lập báo cáo DTM: 

- Ông/Bà: 

II. Đại diện địa phương: 

- Ông/Bà: 

Công xá nhận việc tri bái khai thác vật liệu cho công trình tại biên phòng như sau:

Vị trí: 

Tình trạng sở hữu: 

Trị lượng: 

Cự li vận chuyển: 

Mô tả môi trường xung quanh bái khai thác: 

Chủ sở hữu động y cho khai thác vật liệu đất xây dựng dự án 

Biên bản được thông qua, các bên nhận tri ki tên.

Xác nhận của địa phương 

Đại diện chủ mô đất 

Đơn vị lập báo cáo DTM 

Đại diện chủ đầu tư 

Phó trưởng ban

Nguyễn Anh Hùng

[Signature]
CÔNG HOÁ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

BIẾN BẢN XÁC NHẬN VỊ TRÍ LẤN TRẠI

Công trình: .................................................................
Xã: ........................................................................

Hôm nay, ngày 29 tháng 1 năm 2015, tại Xã ...................................
chúng tôi gồm:

I. Đại diện đơn vị lập báo cáo DTM:
   - Ông/Bà ……………………………….Chức vụ ………………………
   - Ông/Bà ……………………………….Chức vụ ………………………
   - Ông/Bà ……………………………….Chức vụ ………………………

II. Đại diện địa phương:
   - Ông/Bà ……………………………….Chức vụ ………………………
   - Ông/Bà ……………………………….Chức vụ ………………………

Cùng xác nhận vị trí xây dựng lấn trại thi công cho công nhân tại hiện trường như sau:
Vị trí: .................................................................

Tình trạng obras ban:

Diện tích: ..................m2

Mô tả môi trường xung quanh vị trí xây dựng lấn trại:

Yêu cầu đơn vị thi công sau khi hoàn thành công trình hoan trả lại hiện trạng cho khu đất mương
tấm để xây dựng lấn trại thi công.

Biên bản được thông qua, các bên nhất trí ki têm.

Xác nhận của địa phương  Đại diện chủ đầu tư  Don vị lập báo cáo DTM

Phó CT. Nguyễn Văn Phúc  Nguyễn Ánh Kim  Vương Thị Lên Thị
CÔNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

BIỂN BAN XÁC NHẬN VỊ TRÍ ĐÔ THÀI

Công trình: ........................................
Xã ....................................................
Hôm nay, ngày 22 tháng 1 năm 2015, tại Xã ................................................., tỉnh ................................., ngày .................................

Chung tôi gom:

I. Đại diện đơn vị lập báo cáo DTM: ........................................
   - Ông/Bà........................................... Chức vụ ..................................
   - Ông/Bà........................................... Chức vụ ..................................

II. Đại diện địa phương: ........................................
   - Ông/Bà........................................... Chức vụ ..................................
   - Ông/Bà........................................... Chức vụ ..................................

Công xác nhận vị trí độ đặt thái công trình tại hiện trường như sau:

Vị trí: ........................................
Tình trạng số hiệu: ........................................
Trù lượng: ........................................
Cự li vận chuyển: ........................................

Mô tả môi trường xung quanh bài độ thái:

..........................................................

Yêu cầu đơn vị thi công khi độ đặt phải lân lường, gọn gàng, khi độ xong phải san gạt cho bằng phẳng.

Biên bản được thông qua, các bên nhất trí kiền: ........................................

Xác nhận của UBND

Đại diện gia đình

Đơn vị lập báo cáo DTM

Phó Chủ tịch
Nguyễn Văn Phúc

Đại diện chủ đầu tư

Phó trưởng ban
Nguyễn Anh Hùng
Pictures of stakeholder meeting
Appendix A8 - PICTURES OF THE EXISTING CONDITION OF SUBPROJECT AREA

THE EXISTING CONDITION OF SPILLWAY

THE EXISTING CONDITION OF DAM A

THE SLIDE POSITION TOWARDS UPSTREAM OF DAM B

THE SEEPAGE POSITION BETWEEN DAM A AND THE SPILLWAY

THE EXISTING CONDITION OF CREST OF DAM B

THE EXISTING CONDITION OF OUTLET WORKS INTAKE
THE POSITION OF THE DAM AND THE SPILLWAY

THE EXISTING CONDITION OF OUTLET WORKS INTAKE

THE POSITION OF BORROW PITS

THE EXISTING CONDITION OF BAN RESERVOIR

THE POSITION OF DOWNSTREAM OF SPILLWAY

THE POSITION OF THE PROPOSED WORKERS CAMP
THE POSITION FOR ACHIEVEMENT OF MATERIAL
APPENDIX B – SOCIETY

Appendix B1: METHODOLOGICAL NOTE

The purpose of this social assessment (SA), conducted in an integral manner with environmental assessment for this subproject, is two-fold. First, it examined the potential impacts of the subproject – positive and adverse impact – on the basis of planned project activities. Second, its findings inform the design of measures addressing identified potential adverse impact and proposing community development activities that are relevant to the project development goal. For identified adverse impact that could not be avoided, consultation with local people, governmental agencies, project stakeholders, etc., were carried out to ensure affected peoples will be appropriately compensated for, and supported in a manner that their socioeconomic activities will be promptly and fully restored to the pre-project level, at least, and that their livelihoods will not be worsened off, in the long run, as a result of the subproject.

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 with them 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). A gender analysis was also done as part of the SA to understand underlying gender dimensions (from project impact perspective) to enable gender mainstreaming to promote gender equality, and enhance further the development effectiveness of the subproject, and the project as a whole. Depending on the magnitude of the identified potential project impact, and the project development objective, a gender action plan and gender monitoring plan were prepared (please see these plans in the Appendix 7 of this ESIA).

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 1 for how the Sampling Frame). A total of 177 of respondents participated in the SA exercise for this subproject, of which 128 people participated in the households survey (quantitative), and 49 people participate in focus groups discussions, community meetings, key informant interview (qualitative).

In Section 5, we will present the findings of the SA (positive and positive impact), including the result of the gender analysis. In section 4, we will present briefly the SA results, along with the recommendations on the basis of the SA findings. A gender action plan and gender monitoring plan are presented at Appendix 7 of this ESIA, and the public health intervention plan and public consultation and communication plan were presented at Appendix 5 and 6, respectively).
Appendix B2: PUBLIC HEALTH INTERVENTION PLAN

1. The necessity of the construction of public health management plan

The activities of the subproject will generate impacts on the surroundings quality: air, water and soil environment, in addition it may arise disease. All these factors will affect directly 50 workers, the entire population around the project area along the transport route. The consequence of these effects lead to increase occupational accidents, traffic accidents, diseases related to respiratory and intestinal system and eyes.

There are households and 50 workers will directly contact with sources of pollution and disease from the activities of the project, although subproject have had measures to limit pollution such as dust, emissions, wastewater and epidemics, but there are potential impacts that we do not see immediately, so need to take measures for early detection of disease and sources of disease. The plan indicates the measures to minimize and prevent those impacts.

2. Objective

To control and prevent diseases, raise awareness of the people and the workers to protect health yourself; help people access fully medical services. Organize regularly medical examination to detect early disease due to impacts of the subproject; to build treatment plans for incidents related to diseases, occupational accidents and traffic.

3. Measure and content of public health management

- To train and raise awareness, prevent impacts on health
- Organize regularly medical examination for workers and people in the subproject region
- Build plan to minimize the impact on public health
- Build plan to prevent and treat diseases

4. Role and responsibility of agencies, organizations and individuals

Department of Agriculture and Rural Development (DARD)/ Project Management Unit (PMU):

- DARD and PMU are responsible for building materials about public health safety training.
- Coordinate all levels of authorities in Tien Luong commune (local authorities, Fatherland Front, Women's Union, Farmers’ Union, Youth Union, hamlet representative) organize propaganda activities about health safety.

Department of Health, Cam Khe District Preventive Medicine Center

- To train and raise awareness for all basic levels, contractors and residents about prevention measures and treatments of diseases;
- Check the medical examination process;
- To direct promptly when epidemics appear, resolving incidents related to public health.

People’s Committee, Social Organizations

- To direct, guide and organize the health safety work; to coordinate closely with contractor, Department of Health and Preventive Medicine Center when epidemics appear.

    Health Station: To prepare the medical examination plan and guide water pollution treatment, epidemic prevention and treatment.

5. Implementation Schedule

Public Health Management Plan implemented at 3 stages of the subproject and extended 6 months at operation stage.
Table B2-1 Implementation Schedule of “Public Health Management Plan”

<table>
<thead>
<tr>
<th>No</th>
<th>Measure</th>
<th>Content</th>
<th>Responsible unit</th>
<th>Cost</th>
<th>Time</th>
</tr>
</thead>
</table>
| 1  | To train and raise awareness, prevent impacts on health | - Identify the impact of air and water environment, food safety.  
- Preventable measures (using a comforter when entering the affected area, treat water pollution by alum and chloramine B)  
- Cleaning household sector, ranch house | - Department of Agriculture and Rural Development (DARD)  
- Project Management Unit (PMU)  
- Cam Khe district Preventive Medicine Center  
- Health Station at commune/ward  
- Contractor | 15.000.000 millions | 2 stages in the early and the mid-stage of the project |
| 2  | - Organize regularly medical examination for workers and people in the subproject region | - Check the health of workers 3 months/ time, residents in the affected areas 6 months / time  
- The diseases related to respiratory system, intestinal tract, eyes  
- To consult the affected people during examination  
- Advise or handle when the detection of abnormalities related to the impact of subproject (timely notify to the authorities and functional units) | - Department of Agriculture and Rural Development (DARD)  
- Project Management Unit (PMU)  
- Cam Khe district Preventive Medicine Center  
- Health Station at commune/ward  
- Contractor | Budget of Cam Khe district | 3 months/ time from the start of construction to 6th month |
<p>| 3  | - Build plan to minimize the impact on public health | - Medical staffs at commune/ward monitor regularly the implementation of the mitigation | - Department of Agriculture and Rural Development | Budget of Cam Khe district and contractor | Continuously during the construction time |</p>
<table>
<thead>
<tr>
<th>No</th>
<th>Measure</th>
<th>Content</th>
<th>Responsible unit</th>
<th>Cost</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No Measure</td>
<td>measures of construction units. - To treat timely occupational accidents and traffic - To vaccinate completely children, pregnant woman</td>
<td>Project Management Unit (PMU) - Cam Khe district Preventive Medicine Center - Health Station at commune/ward - Contractor - Women's Union - Fatherland Front</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>No Measure</td>
<td>- To spray fly and mosquito-spray in the project area with the frequency of 3 months/time. - To guide the water sanitation; use chloramine B for pre-treatment of wastewater on work site and households. - When appearing epidemic, we need localize epidemic, isolate infectious objects and spray chloramine B to disinfect.</td>
<td>Department of Agriculture and Rural Development (DARD) - Project Management Unit (PMU) - Cam Khe district Preventive Medicine Center - Health Station at commune/ward - Contractor - Women's Union - Fatherland Front</td>
<td>Budget of Phu Tho province (Department of Health) and contractor</td>
<td>Continuously during the construction time (18 months)</td>
</tr>
</tbody>
</table>

4 Build plan to prevent and treat epidemic
Appendix B3: PUBLIC CONSULTATION, PARTICIPATION AND COMMUNICATION STRATEGY

1. The necessity of the construction of communication plan

The project cause impacts: (i) positive impacts: ensure safely for households in the downstream area, ensure stability source of irrigation water supply for 150ha of rices and vegetables (ii) negative impacts: acquire land and assets on land of 15 households, affect economy and public health, impact on gender equality…

The communication and public consultation plan is done throughout from the establishment of the investment project to the project operation. This helps local communities and managers to understand and visualize the entire impacts (positive, negative) to provide mitigation measures the impact on the natural environment and society, especially vulnerable objects include children, the elderly, women and sensitive ecosystem.

Information from communication and public consultation plan help managers, local authorities, monitoring unit to give decisions quickly or change timely decisions or plans during the project implementation.

2. Objective

To publish information about sub-project and provide all materials on the action plan to government at various levels, social organizations, unions and resident in sub-project areas. To consult local communities and organizations for the plan will be made for each stage of the project. The feedback helps the investors and the management level to improve plans to meet practical needs prior to the implementation of the action plan.

3. Contents

- Information on the subproject and policies of interest will be disseminated to people by Project Management Unit (PMU);
- Environmental and Social Management Plan: (i) the PMU and consultancy units provide information of impacts and mitigation measures; (ii) To consult the local authorities and social organizations, unions, people around the project area.
- Resettlement Action Plan: Provides information about land acquisition, resettlement, compensation cost apply framework and support policies of the subproject and the provisions of Phu Tho Province and government at various levels, affected people
- Gender Action Plan: provides information about gender equality for the local authorities and social organizations, unions, people around the project area.
- Public Health Management Plan: provides information on the solutions, disease prevention plan, medical examination periodically.
- Social security, traffic safety, social evils: provide information about law, legal education for workers, people around the subproject area.
- Dam Safety: disseminate plans when occurring dam safety incidents in the construction process and the rainy season.
- Operate mining and flood discharge: provide information and detailed plans for the flood discharge to people around the project area and downstream area; make protection plan for the people, the buildings in downstream of the dam.

4. Forms of communication, community consultation

In order to organize the effective communication activities, need understand the basic elements of the communication process and public relations of them.
Diagram B3-1: The elements of the communication process

- Organize meetings to disseminate information for local authorities, social organizations, unions, people of the subproject region (Tien Luong commune);
- Through the mass media, basis loudspeakers, commune and village boards.
- Issue brochures, consultative questionnaires to local authorities, unions, people of the subproject area;
- Through the activities of organizations and clubs;
- Training;
- Other media and information forms.

5. Role and responsibility of agencies, organizations and individuals

Department of Agriculture and Rural Development represents Phu Tho province people’s committee is an investor, and Project Management Unit of Phu Tho province is the project implementation unit.

Department of Agriculture and Rural Development (DARD)/ Project Management Unit (PMU):
- DARD and PMU are responsible for building materials about communication plan and participatory public consultation.
- Coordinate government at various levels in Tien Luong commune, (local authorities, Fatherland Front, Women's Union, Farmers’ Union, Youth Union, hamlet representative) organize propaganda activities for this plan.

People’s Committee, Social Organizations
- To direct, guide and organize the propaganda activities and disseminate contents of communication, participatory public consultation.
- Direct news agencies, local propaganda agencies to spend the appropriate time for disseminating plans and the impact of the subproject.

Land Clearance Committee
- Provide information about land acquisition, resettlement, compensation cost apply framework and support policies of the subproject and the provisions of Phu Tho Province and government at various levels, the affected people.

Health Station: disseminate information on the disease prevention plan, medical examination periodically, solutions when having epidemic.
6. Implementation Schedule

The communication plan and participatory public consultation implemented under stages of the subproject; to provide completely information for local people and government at various levels.

**Table B3-1 Implementation Schedule of “Communication Plan, Consultation with Community Participation”**

<table>
<thead>
<tr>
<th>No</th>
<th>Stage</th>
<th>Content</th>
<th>Form</th>
<th>Responsible unit</th>
<th>Receptive unit</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Preparation</td>
<td>Disseminate information, consult the authorities about subproject: scale, type of investment, the main works, incidence, benefits of the subproject.</td>
<td>Organize meeting at government at various levels, mass organizations.</td>
<td>DARD and PMU</td>
<td>Phu Tho Province People’s Committee, Department of Planning and Investment, Department of Finance, Department of Natural Resources and Environment, Cam Khe district People’s Committee, Government of Tien Luong commune.</td>
<td>Perform 2 times: to prepare and present a draft of resettlement action plan.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disseminate information about policies, compensation plan, the draft of resettlement action plan.</td>
<td>Meetings, leaflets, consultation votes at all government levels, the affected households around the subproject area.</td>
<td>PMU coordinate with design consultancy unit, resettlement action plan consultancy unit.</td>
<td>Cam Khe district People’s Committee, Tien Luong commune, Women's Union, Fatherland Front, Farmers’ Union, Cadastral Division of commune/ precinct, 60 households in the project area.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disseminate information about project, present the draft of ESIA and ESMP reports, gender plan, public health, communication, etc.</td>
<td>Meetings, leaflets, consultation votes at all government levels, the affected households around the subproject area</td>
<td>PMU coordinate with design consultancy unit, ESIA consultancy unit</td>
<td>Cam Khe district People’s Committee, Tien Luong commune, Women's Union, Fatherland Front, Farmers’ Union, Cadastral Division of commune/ precinct, 60 households in the project area.</td>
<td>Perform 2 times: to prepare and present a draft of resettlement action plan.</td>
</tr>
<tr>
<td></td>
<td>Compensation and resettlement</td>
<td>Organize meetings to disseminate information about measure, counting, compensation</td>
<td>PMU coordinate with Compensation, Assistance and Resettlement Board</td>
<td>Tien Luong commune People’s Committee, Women's Union, Fatherland Front, Farmers’ Union, Cadastral Division of</td>
<td>Implement according to Resettlement Action Plan report.</td>
<td></td>
</tr>
</tbody>
</table>

101
<table>
<thead>
<tr>
<th>No</th>
<th>Stage</th>
<th>Content</th>
<th>Form</th>
<th>Responsible unit</th>
<th>Receptive unit</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Plan, post information in noticeboard of commune/ precinct and village/ urban groups.</td>
<td></td>
<td>commune/ precinct and 24 affected households.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Construction and Operation</td>
<td>Gender Action Plan, Public Health Management Plan, Social Management Plan, Environmental Management Plan</td>
<td>Meetings, leaflets, basic broadcasting, consultation votes at government at various levels, the affected households around the subproject area</td>
<td>PMU and Social Supervising Consultant, Tien Luong commune People’s Committee Women’s Union, Fatherland Front, Farmers’ Union, Cadastral Division of commune/ precinct and 60 affected households.</td>
<td>Implement in 3 phases of the subproject.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Public order and social evils, Traffic Safety and Fire Prevention and Extinction</td>
<td></td>
<td>PMU and contractor</td>
<td>Tien Luong commune People’s Committee Women’s Union, Fatherland Front, Farmers’ Union, Health Station, Cadastral Division and Police of commune/ precinct.</td>
<td>Construction Stage.</td>
</tr>
</tbody>
</table>

Monitoring Assessment: PMU make a monitoring report of communication plan and participatory public consultation to control communication content, synthesize feedback from the Supervising Consultant Unit, local government, social organizations, unions and citizens to supplement or amend policies and measures of the management plan to suit each stage of the subproject.
Implementation Cost

The implementation cost of this plan is integrated with other plans (communication content and methods will be acquired and build by other plans. Social Management Plan chairs other plans related to social issue. Cost of this phase focuses primarily for broadcasting and organizations, the expected cost is 50,000 million (fifty million VND) in 18 months.
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).

<table>
<thead>
<tr>
<th>Achievements</th>
<th>Tasks and Indicators</th>
<th>People in charge</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Achievement 1:</strong> 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 of the villages and communes to the Contractors for selection in favor of poor and vulnerable households.</td>
<td>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. The communal women group shall ensure the involvement of local female workers in the Project.</td>
<td>During construction stage</td>
</tr>
<tr>
<td>Achievements</td>
<td>Tasks and Indicators</td>
<td>People in charge</td>
<td>Period</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------</td>
<td>------------------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>Achievement 2:</strong> Enhancement of people’s capacity to make advantages of the Project</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>
</tr>
<tr>
<td><strong>Achievement 3:</strong> Enhancement of awareness on potential social evils of vulnerable objects, especially women and ethnic minorities</td>
<td>Programmer on HIV/AIDS and human trafficking. Programmer 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; Women's Union, the representative of Centre for HIV/AIDS prevention and communal staff shall give training to communicators in each commune/village in the project area. The programs will be implemented at the communes and villages by two communicators (village chief and one member of the Women’s Union). The program will be implemented in the villages and on market-days through distribution of project/program materials and use of loudspeakers</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 Centres 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>
</tr>
<tr>
<td>Program on risk mitigation during project construction stage:</td>
<td>PMU and the contractor will coordinate closely with the health services in communes and districts to implement programs on awareness enhancement and education on disease prevention, diagnosis and treatment for laborers. All programs and documents are built with integration of gender issues, including PMU The Contractor Local Health Centre Communal staff The Women’s Union shall perform general coordination for better HIV prevention.</td>
<td>PMU The Contractor Local Health Centre Communal staff The Women’s Union</td>
<td>During construction stage.</td>
</tr>
<tr>
<td>Achievements</td>
<td>Tasks and Indicators</td>
<td>People in charge</td>
<td>Period</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------</td>
<td>------------------</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td>vulnerability and needs of men and women. The Contractor shall: Implement awareness enhancement programs workers and communities, including education and communication on HIV infection and preventive measures. Provide free consulting services and encourage employees to do HIV tests so that they all know about their health status. Support the access to health services and encourage HIV-infected patients to admit their status; Provide medical equipment (free condoms) for workers in the camps;</td>
<td>Project implementation consultant - PPMU</td>
<td>During design and initial implementation stages</td>
</tr>
<tr>
<td>Project Management</td>
<td>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.</td>
<td>- PPMU</td>
<td></td>
</tr>
</tbody>
</table>

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Table B4-2. Estimate cost for gender activities

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity</th>
<th>Quantity</th>
<th>Budget</th>
<th>Evaluation indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Mil. VND)</td>
<td>Number of beneficiaries</td>
</tr>
<tr>
<td>I</td>
<td>Activities related to gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Training and awareness raising on gender and gender mainstreaming</td>
<td>One two-day training course</td>
<td>16,000,000</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>Training on HIV/AIDS prevention</td>
<td>2 training courses</td>
<td>12,000,000</td>
<td>90</td>
</tr>
<tr>
<td>3</td>
<td>Training on enhancing capacity for community supervision board</td>
<td>2 training courses</td>
<td>17,000,000</td>
<td>60</td>
</tr>
<tr>
<td>4</td>
<td>Communication on gender mainstreaming, HIV/AIDS prevention; sanitation</td>
<td>2 training courses</td>
<td>15,000,000</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>and traffic safety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Prepare Pano, poster, leaflet.</td>
<td></td>
<td>10,000,000</td>
<td>2000</td>
</tr>
<tr>
<td>II</td>
<td>Other development activities</td>
<td></td>
<td>68,500,000</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Support equipment for commune women union</td>
<td></td>
<td>45,000,000</td>
<td>Commune women union</td>
</tr>
<tr>
<td>2</td>
<td>Training and awareness raising on potential impacts of the subproject</td>
<td></td>
<td>15,000,000</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>to people health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Communication via the commune loudspeaker on the construction activities</td>
<td>One a week</td>
<td>2,500,000</td>
<td>900</td>
</tr>
<tr>
<td>4</td>
<td>Consultation meeting at large scale with representatives of commune</td>
<td>Every three months</td>
<td>4,000,000</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>authority and district and related households.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Announcement on the commune’s notice board</td>
<td>Every two weeks</td>
<td>2,000,000</td>
<td>720</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td>133,500,000</td>
<td></td>
</tr>
</tbody>
</table>
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 administrat and legal fees relating to complaint handling.

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. The duration of first-time settlement of complaints shall not exceed 5 days from the date of receipt of the complaint (In remote regions that have a difficult to travelling, the time limit for complaint settlement is no more than 15 days). The CPC secretary shall be responsible for compiling and achieving documentation that they are handling.

When the CPC issues a decision, households may appeal within 30 days. If the second decision has been issued but the household still not satisfied with the decision, they may appeal to the People's Court or the District People’s Committee.

The second stage in the District People’s Committee: When DPC receives a complaint from the household, the DPC will have 15 days (or 30 days for remote and mountains areas) after receiving a complaint. DPC have responsibility for filing and storing documents on all complaints that it handles.

When DPC issues a decision, households may appeal within 30 days. If the second decision has been issued but the household still not satisfied with the decision, they may appeal to the provincial authority.

The third stage in the Provincial People’s Committee: When PPC receives a complaint from the household, the provincial authority will have 30 days (or 45 days for remote and mountains areas) after receiving a complaint. Provincial authorities have responsibility for the compiling and achieving documentation of all complaints that are submitted.

When the provincial authority issues a decision, households may appeal within 45 days. If the second decision has already been issued and the household still not satisfied with the decision, they may appeal to the court within 45 days. Provincial agency then have to pay compensation paid to an account.

The final stage, the provincial court. If the complaint submits to court and the court make a decision with the truth belongs to the complainant, the provincial government will have to increase the amount of compensation to the extent that the court decides. In case of the court sided with the provincial authority, the complainant will receive a sum of money that they has been paid to the court.

To ensure that the appeal mechanism described above is practical and acceptable to the PAP, the mechanism has been consulted with governments and local communities, taking into account the specific culture as well as the traditional cultural mechanisms to address and resolve complaints and disputes. The objects and efforts of the national community are need to recognize and identify to find the solutions that acceptable in cultural aspect.
### Table annex B6.1: Arrangement implementing EMP

<table>
<thead>
<tr>
<th>Organization</th>
<th>Role and responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Subproject’s preparation</strong></td>
</tr>
<tr>
<td>CPO</td>
<td>Guiding the policy safety staffs of Project Management Board of province during the period for preparing Environmental and Social Impact Monitoring Report</td>
</tr>
<tr>
<td></td>
<td>Review and contribute the ideas for report submitted by Provincial Project Management Board</td>
</tr>
<tr>
<td></td>
<td>Project Owner has highest responsibility on environmental activities during construction time;</td>
</tr>
<tr>
<td></td>
<td>Project Owner has highest responsibility on environmental activities in term of the performance of EMP during operation period.</td>
</tr>
<tr>
<td>Provincial People’s Committee</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Taking the responsibility on implementing (EMP) in pre-construction and construction periods;</td>
</tr>
<tr>
<td></td>
<td>Guarantee the detail of contract and bidding documents including environmental requirements;</td>
</tr>
<tr>
<td></td>
<td>Conducting the investigation and supervision environmental issues during construction time;</td>
</tr>
<tr>
<td></td>
<td>Coordinating Environmental Monitoring Report to CPO;</td>
</tr>
<tr>
<td></td>
<td>Taking the responsibility on implementing (EMP) in the first operation year;</td>
</tr>
<tr>
<td></td>
<td>Conducting the investigation and supervision environmental issues in the first operation year;</td>
</tr>
<tr>
<td></td>
<td>Assist project owner in giving out environmental requirements in operation procedure and maintenance project;</td>
</tr>
<tr>
<td>Provincial Project Management Board</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td>Role and responsibility</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td>Subproject’s preparation</td>
</tr>
<tr>
<td>District People’s Committee</td>
<td>Approve Environmental protection Commitment (CEPs) of subproject in accordance with legal regulations of Vietnam Government;</td>
</tr>
<tr>
<td>Community Supervision Board and the other members of local community (CSBs ¹)</td>
<td>Participating in consultation activities and determination, preparation for subproject; Ability to contribute the ideas to environmental assessment document when it has been introduced to them;</td>
</tr>
<tr>
<td>Construction Supervision Consultant</td>
<td>n/a</td>
</tr>
<tr>
<td>Construction Contractor</td>
<td>n/a</td>
</tr>
</tbody>
</table>

¹ CSBs, has been established according to Decision 80/2005/QD-TTg dated 18/04/2005 of Prime Minister on promulgating investment supervision regulation of community. Item 8 of Decree 80/2006/ND-CP provides for community monitoring chance the conformity, implementation supervision and investment result assessment in commune including environmental impacts.
<table>
<thead>
<tr>
<th>Organization</th>
<th>Role and responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subproject’s preparation</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Mitigation measures</td>
<td>Parameters</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Pre-construction period</strong></td>
<td></td>
</tr>
<tr>
<td>Implementing Resettlement Action plan</td>
<td>The number of affected households has been compensated</td>
</tr>
<tr>
<td></td>
<td>Complaint arising relating to compensation and benefit</td>
</tr>
<tr>
<td><strong>Construction period</strong></td>
<td></td>
</tr>
<tr>
<td>1.1 Control water quality</td>
<td>Turbidity</td>
</tr>
<tr>
<td></td>
<td>Measuring the volume of oil, odor and other waste water. Rubbish on the flow</td>
</tr>
<tr>
<td>1.2 Minimizing dust arising</td>
<td>The number of concentrated dust</td>
</tr>
<tr>
<td>1.3 Minimizing noise arising</td>
<td>Noise level</td>
</tr>
<tr>
<td>1.4 Traffic safety</td>
<td>The number of accident and accident reason</td>
</tr>
<tr>
<td></td>
<td>The slow traffic time that affected by construction</td>
</tr>
<tr>
<td>1.5 Solid waste management</td>
<td>Clean level of tents</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Mitigation measures</td>
<td>Parameters</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------</td>
</tr>
<tr>
<td>1.6 Asset management</td>
<td>The volume of rubbish</td>
</tr>
<tr>
<td>1.7. The health and safety of local residents</td>
<td>Complaint of local people relating to construction activities of workers</td>
</tr>
<tr>
<td>1.8. Construction rubbish management</td>
<td>The number of labor accident at construction site</td>
</tr>
<tr>
<td>1.8. Construction rubbish management</td>
<td>The number of work postponed due to accident or disease</td>
</tr>
<tr>
<td>1.8. Construction rubbish management</td>
<td></td>
</tr>
</tbody>
</table>

**Operation period**

<table>
<thead>
<tr>
<th>2.1 Risks on dam</th>
<th>The leakage points of dam</th>
<th>Whole dam</th>
<th>Observe and interview</th>
<th>6 months/time</th>
<th>Operation management unit</th>
<th>State’s budget</th>
</tr>
</thead>
</table>

Repair and Improvement of Ban Reservoir, Tien Luong commune, Cam Khe district 113
<table>
<thead>
<tr>
<th>Mitigation measures</th>
<th>Parameters</th>
<th>Location</th>
<th>Method</th>
<th>Frequency</th>
<th>Responsibility</th>
<th>Expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 Landslide in flood season</td>
<td>Number of landslide point, Frequency of landslide</td>
<td>Whole dam</td>
<td>Observe and interview</td>
<td>Monthly or when having the feedback of local people</td>
<td>Operation management unit</td>
<td>State’s budget</td>
</tr>
</tbody>
</table>
### Table annex B6.3: Monitoring and Reporting system

<table>
<thead>
<tr>
<th>Project’s Phase</th>
<th>Type of report</th>
<th>Frequency</th>
<th>Responsibility</th>
<th>Agency receives report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Execution</td>
<td>Report on implementing ESMP presents environmental activities on the field</td>
<td>Monthly</td>
<td>Construction contractor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>complies rightly with ESMP and supervision results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Report on ESMP implementation of Construction Supervision Consultant present</td>
<td>Monthly</td>
<td>Construction Supervision Consultant</td>
<td>Project Management Board</td>
</tr>
<tr>
<td></td>
<td>clearly activities comply rightly with ESMP and supervision results. The report</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>includes (i) the main impacts during construction period (ii) propose the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>measures to minimize adverse impacts (iii) Assessment the result of performance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>measures to minimize adverse impacts to environment and social of construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>contractor (iv) The results of problem solving and measure to overcome</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>shortcomings from last report; (v) Proposing activities for minimizing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>environmental for the next construction period</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Report on environmental activities of subproject present clearly activities</td>
<td>6 months/time</td>
<td>Provincial Project Management Board</td>
<td>CPO and WB</td>
</tr>
<tr>
<td></td>
<td>comply rightly with ESMP and supervision result</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The subproject’s environmental report presents all environmental activities</td>
<td>When the subproject finished</td>
<td>CPO</td>
<td>WB / MONRE</td>
</tr>
<tr>
<td></td>
<td>and conformity to ESMP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Independent monitoring report on Environmental and Social Safety states the</td>
<td>6 months/time</td>
<td>Independent Environmental Consultant</td>
<td>Subproject Management Board and WB</td>
</tr>
<tr>
<td></td>
<td>following contents: (i) Supervision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>result of construction scene; (ii) Community based Supervision result; (iii)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Synthesis supervision results of execution supervision consultant; (iv) Result</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>of environment monitoring and (v) Assessment results implementing ESMP and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>recommendation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>Implementation report ESMP: Present clearly activities conform to commitment</td>
<td>6 months/time</td>
<td>People’s Committee of Cam Khe district</td>
<td>CPO and WB</td>
</tr>
<tr>
<td></td>
<td>on ESMP of subproject during operation time</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Repair and Improvement of Ban Reservoir, Tien Luong commune, Cam Khe district 115
OVERVIEW OF EMERGENCY PREPAREDNESS PLAN

The existence of large dams and reservoirs at the upstream of the residential areas requires the preparation of an Emergency Preparedness Plan (EPP) relating to the professional for each dam. The purpose of the emergency preparedness Plan aims to assist the authorities responsible for public safety issues in order to take the proper and necessary measures for preventing injury and minimizing material damages by the accidents predicted in case of occurring the dam failures.

Each dam, reservoir and risk-containing area have its own characteristics, and so each emergency preparedness Plan shall be prepared taking into account the specific conditions of such work. However, there are some general issues need to be mentioned for each work in need of the emergency preparedness Plan.

So far, the Consultant has yet to determine the guidelines of Vietnam on the issue of the requirements for the preparation of emergency preparedness Plan or the directives such as the responsibilities relating to the preparation and implementation of emergency preparedness Plan shall be handed over to anyone.

Finally, an sample estimation for making the emergency preparedness Plan has also been created. It is more difficult to determine the problem of benefit. Generally, it should be considered that if the dam safety management is better and the emergency preparedness Plan is made for all existing dams, the average number of accidents caused by the floods shall be reduced.

GENERAL REQUIREMENTS FOR EMERGENCY PREPAREDNESS PLAN

To turn an emergency preparedness Plan into a useful tool for prevention of disasters and mitigation of disasters, it is necessary to have the certainly legal tools in order to allow the relevant authorities responsible for the formulation and implementation of emergency preparedness Plans to implement their necessary powers. These powers shall be decentralized and specified for the urgent conditions relating to legislation. If the current law is proved to be insufficient for this purpose, it is necessary to consider the adjustment of the legal framework.

In principle, the organizations responsible for the management and the operation and maintenance of a certain dam shall also have the primary responsibility for making the emergency preparedness Plan. These organizations should have the reasonable knowledge relating to the risks associated with dams and reservoirs of a certain work. In case of project for supporting the water resources of Vietnam, the hydraulic works management and exploitation Companies shall take primary responsibility for the formulation and implementation of emergency preparedness Plans for each certain work.

The provincial People’s Comitees, where the dams are located in, shall be able to play a supervisory role. Other relevant authorities can also be entrusted to set out the rules and regulations, and to make, implement, inspect and promote the emergency preparedness Plans.

The preparation of an emergency preparedness Plan in detail for a dam and reservoir requires the proper maps, data relating to river, dam, topography, hydrology, rural and urban infrastructure, population and the physical assets at risk, etc as well as the special skills and computer programs to assess the potential impacts of various risk scenarios. These tools are not available in the hydraulic works management and exploitation Companies and before making the emergency preparedness Plans of such Companies, it is necessary to have a certain investment and extensive preparation. There are many methods for dealing with this issue, and they can support the hydraulic works management and exploitation Companies through the National Dam Safety Authority expected or relevant professional Consultants or institutes.

Since there is no (extensive) emergency preparedness Plan for most of the dams and reservoirs, the costs related to the preparation and implementation of emergency preparedness Plans funded by the budget have not been allocated.
If additional resources for the budget can not be from the people, then it is predicted that the relevant authorities shall take advantage as much as possible the existing resources such as human resources, equipment and telecommunication and communication devices etc. This would require a very detailed plan and the close coordination among the telecommunication and communication actions.

The emergency preparedness Plan should be updated annually and submitted to the Provincial People’s Committee for approval.

THE EMERGENCY PREPAREDNESS PLAN FOR BAN DAM

Currently, the downstream of Ban dam is settled and lived and stably produced by the people (including 194 household and 20,000 ha of land). If the dam is broken, the losses of lives and property of the people are immeasurable.

OVERVIEW

After completion, the work is expected to hand over to the company of irrigation work management and use for management, this company is responsible for preparing the emergency preparedness Plan for the relevant dams and reservoirs. The emergency preparedness Plan must be prepared on the basis of close cooperation with the provincial authorities responsible for flood prevention, and shall be submitted the Provincial People’s Committee for approval. This plan must be updated and the submitted for approval once a year before the flood season.

An outline of the emergency preparedness Plan, with its form is the list of items to be checked with a series of headers relating to the Emergency Preparedness Plan and the actions required. The list of items to be checked can be used for making the emergency preparedness Plan in the future. In general, the following main activities are particularly noticeable upon making (emergency) plans for potential problems of dam.

STRENGTHEN SUPERVISION OF HYDRAULIC WORKS MANAGEMENT AND EXPLOITATION COMPANY

The Emergency Preparedness Plan should be started with the detailed guidelines on monitoring the dam and ancillary works of the hydraulic work management and exploitation company’s employees, especially the monitoring in the periods of extreme rain in the basin or in the case of the reservoir water level rising. The guidelines should detail the special points in need of observe, especially in the case of rapidly rising the reservoir water level. The work of monitoring consist of the regular observe of seepage along the dam foot and in any position along the dam in the place where is expected that the seepage shall only occur upon the high reservoir water level. Depending on the number of parameters, for example:

- The heavy and widespread rainfall in the basin for a prolonged period;
- The rainfall in the basin of water collected in a short period;
- The water level of the reservoir and the rising of water level in the reservoir;
- The increase of seepage; or
- The cloudy seepage in the downstream slope or at the dam foot;
- The movement of the dam crest and the downstream of dam.

The hydraulic work management and exploitation company should calculate a reasonable alarming level in more detail, and adjust according to the actual situation.

DEFINITIONS AND NOTICE OF ALARMING LEVEL

For each alarming level or a specific situation, it is necessary to initiate the measures that would be widely deployed in the future when the conditions become deteriorated and the situation becomes more
serious. These measures shall start with the internal information of the hydraulic work management and exploitation company, and increase in terms of intensity along with increase of the severity of the situation, for example:

- The hydraulic work management and exploitation company’s management department must be continuously informed;
- Suspend the annual leave of a certain number of staff of the hydraulic work management and exploitation company;
- Police and local rescue forces must be in alarming condition;
- Some certain staff and operators with the devices transferred to the dam or other locations;
- Notify through local media and radio stations;
- The officials of Provincial People’s Commitee, the military, the public work department and other departments must be in alarming condition, and must be instructed;
- Mobilize support units (firefighting forces, the army, the red cross society) and equipment;
- Public information and ensure that everyone is informed;
- Block some certain routes, stop or strengthen bus and train;
- Mobilize helicopters, boats and other transport equipment;
- Prepare shelter;
- Request removal for the most dangerous areas;
- Request the enture removal;
- Notify the emergency situation.

The alarming level should be clearly defined, and the definition should be distributed to all staff and agencies concerned immediately after the approval of emergency preparedness Plan. The people need to be fully aware of the alarming levels which shall be clearly informed to them by sirens or similar things. After consulted by the local authorities, the hydraulic work management and exploitation company shall be guided to achieve the best results for alarming people.

**DATA COLLECTION**

To establish an emergency preparedness Plan, firstly the hydraulic work management and exploitation Company require detailed maps of the entire region which can be affected. The buildings, roads, bridges, high and low areas, dam banks, canals, etc must be presented on the map. Especially for the preparation of dam failure analysis, it is necessary to have the detailed information, including cross section of the river basin, the main obstacles for the progress of a flood wave in the flow of the river or the mudflats, sunken areas can temporarily act as reservoirs, dykes, water dividing roads, ditches, creeks and other topographical factors which can affect flood wave. The terrain maps must extend beyond the project area in order to determine the approach road and areas and works (such as schools and community halls) which can be used as a place for shelter and a place of relocation for the victims of the flood. The hospitals near the flooded areas must be identified and be informed on the tasks which they may have in the event of injury from broken dam problem.

**BROKEN FAILURE ANALYSIS**

It is necessary to conduct a dam failure analysis to map the boundaries of the area may be affected by the flood. The analysis is recommended to conduct many different conditions such as assumption of the normal water level, the full reservoir water level with maximum flood load, a quickly open hole in the dam body, a lot of preliminary cases such as an alluvial flooded, and the relatively dry conditions, high surface water flows at the same time from the river tributaries in the downstream.
Moreover, the computer programs, upon analyzing dam failure, can be run on multi coefficient of roughness and possible measures to reduce or otherwise affect flood conditions in some certain locations such as decrease of flooding speed near the residential areas, or lifting to the roads to access or exit some certain areas.

The impact of the obstacles in the flow of a river or mudflats should also be evaluated in the regulatory view to limit the flooding level on the river, not only in the catastrophic cases but also for “normal” extreme point floods. The implementation of most possible measures to minimize the impact of extreme point flood discharge cannot be conducted in the short term, it must be used as tools for planning and policy for the river basin in the future, or it must be gradually implemented.

**FLOODING MAP**

Dam failure analysis must identify clearly the most dangerous areas in case of occurring disaster. Results of the analysis shall be presented on the flooding maps, describe the possible depth, flood velocity (as a sign of potentially dangerous conditions), the progression of waves interrupted in the basin, and mention the time for salvage activity.

When a preliminary dam failure analysis may briefly indicate above mentioned flooding parameters, sooner or later the dam failure analysis shall be upgraded under the same relevant and better conditions. Especially the influence of the embankment (slightly) improved which is used for road, railway, irrigation canal, flood prevention, sediment piles along the canal, is also notable. In such locations, the maximum flood velocity can also increase making it impossible to access the embankment or the roads and causing the landslides destroying a part or whole of this embankments. A network of high obstacles in sunken areas may divert flood flows and cause more serious conditions at the locations where these conditions are not desired.

The flooding maps for selected conditions must be available to submit to the important agencies relating to the physical planning of the area, and submit to the relevant authorities relating to the salvage activities if possible (province, city, police, firefighting, hospital, military, etc.). Such maps need to be updated and redistributed in cases of determining the conditions with the important changes. Number of agencies and organizations receive such maps (and other information) depend on the severity of the conditions, and generally depend on the water collecting function of the reservoirs, the dam height and areas directly affected.

**ORGANIZATIONAL ISSUE**

Although the hydraulic work management and exploitation Company shall be responsible for preparing and maintaining an emergency preparedness Plan, most of the activities after a catastrophic event shall be carried out by other agencies and organizations. The task of the hydraulic work management and exploitation Company for the dams and reservoirs is that preventing the critical situations. It is assumed of occurrence of emergency case, the hydraulic work management and exploitation Company shall take all primary measures possible to avoid a disaster. As long as the conditions become more serious, the hydraulic work management and exploitation Company shouldn’t wait for being warned and assigned by the higher levels. In case of occurring those conditions, it is necessary to clearly define the person who is responsible for their own job. A detailed plan with an extended information system must be continuously sustained until occurrence of disaster.

Firstly the hydraulic work management and exploitation Company must prepare an Emergency Preparedness Plan for the internal purposes in the flood conditions and in case where the expression of the dam shall require more attention. The internal organization of the hydraulic work management and exploitation Company shall immediately deal with at the first alarming level, and inform higher authorities about the concerns and the consequences in case of occurrence.

In the next alarming higher level, it is possible to need the support of other organizations, and a responsibility can be transferred to such organizations. For these cases, it is necessary to have a detailed planning, and the information shall be ready for the necessary actions. It is necessary to be aware that in the bad weather condition, there would have no electricity, the roads can be flooded, the telephone line
can be damaged, and the publication of print, photocopy of maps and planing documents or other directives cannot be implemented.

When the situation become serious, the functional authority of the province shall implement all their responsibilities, and shall need to be provided the plan for the actions to be implemented, which were established in the previous stage. These plans should include organizational issues for emergency activities expected, and should state clearly the responsible lines and communication for all activities and actions decentralized (but well-coordinated), depending on the specific situation.

The competent authority under the emergency preparedness Plan responsible for a number of activities and certain inputs in any alarming phase should be fully informed for any changes of the emergency preparedness Plan. And similar to the organizations designated to support activities such as means of transportation, equipment, material resources and other inputs required in the case of occurring disaster.

PROCEDURES

In the lowest alarming level, the relatively simple internal application procedure of of the hydraulic work management and exploitation Company shall remain in effect as action procedure for the monitor and management of dam and ancillary works. When the situation become worse, and the next alarming level starts, the normal operating procedure of the hydraulic work management and exploitation Company shall be supplemented and replaced by a new procedure focusing on the implementation of the emergency preparedness Plan.

The management guidelines of main dam shall be valid, and the dam management shall be implemented by the experts of the hydraulic work management and exploitation Company as specified in the procedure of the hydraulic work management and exploitation Company for that year. Other agencies have no right to make temporary decision where spillway gate or other inlet or outlet gates shall be opened or not.

The procedure for the higher alarming level shall transfer the entire responsibility for the implementation of emergency preparedness Plan to the higher authority levels (preferably PPC). These procedures shall be clearly allocated for the responsibility and the right for the certain agencies with the cooperation or support of emergency activities.

The emergency preparedness Plan should include the clear organization plans for easily following the levels of emergency activities. These plans should also include the main telecommunication and communication lines and procedures in need of following for some certain activities, for example requesting the central government to help and requesting the military forces for more support.

In case where the situation become deteriorated, and the displacement becomes the only option, the area to be relocated shall be protected by the police or other armed forces. The emergency preparedness Plan also proposes some provisions for these conditions, and they shall be discussed with the executive agencies which are responsible for maintaining order and rules. The last provisions should include arrangements for taking the necessary forces (such as the red cross society and similar forces) to the higher residential area in the heart of flooded areas.

COMMUNICATION

Communication is a vital part of any emergency plan. In the very special conditions, most of the means of communication can be damaged. The emergency preparedness Plan should take into account this fact, and identify the means of communication that can be used in the emergency conditions.

The normal telephone lines and mobile phones can not be used in extremely emergency conditions. The communication via radio can solve somehow of the problem. In this regard, the mobilization of police and the armed forces involved in making emergency preparedness Plan is vital.

First of all, the communications between the field of dam and the headquarters of the hydraulic work management and exploitation Company must be ensured safety. These communication lines must be active at all times, and the information about the water level of reservoir can be read at the hydraulic work management and exploitation Company’s headquarters at any time. During the regular dam
inspections, the dam safety inspector must pay attention to the means of communication established for each dam (or saddle dam).

Secondly, the communication with higher levels should be well structured. When the dam’s situation become deteriorated, and when the responsibilities are beyond the capacity of the hydraulic work management and exploitation Company, a higher authority must be able to smoothly receive the responsibilities (or part) and continue to cooperate in the implementation of the emergency preparedness Plan. In such situation, the means of communication are in need of capacity of receiving multiple incoming calls.

The contacts and communication procedures must be clearly and fully documented. All agencies, where have primary responsibility for making emergency plan, shall be received a copy of these procedures as well as the directives and supporting guidances.

**THE TRAINING AND EXERCISE OF EMERGENCY PREPAREDNESS PLAN**

An emergency preparedness Plan shall include the training and exercise of a selected number of components in the emergency preparedness Plan. It is best to have a need analysis as the basis for the program. The exercise program must be prepared in conjunction with other relevant agencies. The training and exercise shall focus on the components that the parties concerned are not familiar.

**THE PARTICIPATION AND INFORMATION OF COMMUNITY**

The main beneficiaries of the emergency preparedness plan are the general population who can be affected by the risks of an incident which can occur on the dam. In order to achieve their full cooperation, then the raising of public awareness and support received from the public are essential.

The emergency preparedness Plan must mention the issue of public awareness as an important content, because of the lack of public awareness and support and involvement of the public, all emergency preparedness Plans shall become useless.

After established and approved the draft of the emergency preparedness Plan by the Provincial People’s Committee, the public must be informed about the characteristics of the dam, the risks can occur, the measures are implemented and plans are prepared to avoid the negative impacts or mitigate the consequences. For this purpose, the types of information shall be conveyed to the public through the media such as posters and informing to the students, information on Televisions, announcing in the local newspapers and other mass media.

**LEGISLATION**

After all the plans are established, it is necessary to analyze whether the proposed measures have been backed by a full legal framework or not. In case where the legal system is somehow defective, requesting the competent authority to immediately start adjusting the current law in order to allow the implementation of essential measures. The legislation shall give the authority with the rights to take necessary measures in order to deal with the emergency conditions.

**REPORT**

The emergency preparedness Plan should also include requirements for annual report on its objectives, the process of implementation and the problems encountered. The People’s Committee of the provinces and the Ministry of Agriculture and Rural Development need this information to be able to identify what is a common problem to be solved, and learn from the hydraulic work management and exploitation Companies. The experience gained is to draw in an adjusted approach for the problem of establish and implementation of the emergency preparedness plans.

The annual reports should be brief and include:
- The plans of the previous year;
- The training and practice has been carried out, the results and recommendations for upgrade and improvements;
- The adjustments required for the emergency preparedness Plan of next year;
- The training program for next year;
- The information and data changed;
- Finalization of the budget of the previous year and the budget of the following year.

ESTIMATION RELATING TO THE EMERGENCY PREPAREDNESS PLAN

A series of actions and requirements determined above need an estimated budget and allocated approximately one year before the planned activities are implemented in practice.

The degree of costs depends on many conditions. Apart of the costs can be covered from the operating expenses of the hydraulic work management and exploitation Companies, but others may need to be covered by the budget as well as additional funding, and must be allocated specifically for the establishment and implementation of emergency preparedness Plans. The specific costs related to an emergency preparedness Plan include the following items:
- Public information materials;
- Computers, softwares for dam failure analysis;
- The printed materials, instructions, reports, flooding maps, and other materials;
- Means of enhancing communication (telephone, radio);
- Additional transport costs;
- The costs related to the implementation of training and exercise.
- Costs are summarized in the table below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Basic cost (million VND)</th>
<th>Human resources cost (million VND)</th>
<th>Cost of office operation (million VND)</th>
<th>Total cost (million VND)</th>
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<tr>
<td>1</td>
<td>50</td>
<td>120</td>
<td>30</td>
<td>200</td>
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</tr>
<tr>
<td>5</td>
<td>5</td>
<td>120</td>
<td>30</td>
<td>155</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>500</td>
<td>150</td>
<td>635</td>
</tr>
</tbody>
</table>

These costs as mentioned above do not include costs for local consultants, because it is not clearly known that the local consultants shall provide services to some extent through this project component.
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 and 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/QDD-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/QD-BQP dated November 04, 2005 and No.80/2007/QD-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/QD-TTg dated 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>19.5</td>
</tr>
<tr>
<td>2</td>
<td>Area 2</td>
<td>26.3</td>
</tr>
<tr>
<td>3</td>
<td>Area 3</td>
<td>33.2</td>
</tr>
<tr>
<td>4</td>
<td>Area 4</td>
<td>40.0</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; - 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</td>
</tr>
</tbody>
</table>
- 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
(Applied 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 expenditures</td>
<td>VL</td>
</tr>
<tr>
<td>2</td>
<td>Labor allowance expenditure</td>
<td>Total labor expenditures</td>
<td>NC</td>
</tr>
<tr>
<td>3</td>
<td>Machine expenditure</td>
<td>Total machine expenditures</td>
<td>M</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>Total of direct expenditures</td>
<td>VL + M + NC + TT</td>
<td>T</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>1</td>
<td>Formulation of plan and report on survey result</td>
<td>5% x Z</td>
<td>K1</td>
</tr>
<tr>
<td>2</td>
<td>Temporary accommodation expenditures</td>
<td>5% x Z</td>
<td>K2</td>
</tr>
<tr>
<td>3</td>
<td>Assessment and approval expenditures</td>
<td>Prescribed percentage x Z</td>
<td>K3</td>
</tr>
<tr>
<td>...</td>
<td>Other expenditures (if any)...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>Total estimate value:</td>
<td>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></td>
<td>Direct expenditure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Material expenditure</td>
<td>Total material expenditures</td>
<td>VL</td>
</tr>
<tr>
<td>2</td>
<td>Labor allowance expenditure</td>
<td>Total labor expenditures</td>
<td>NC</td>
</tr>
<tr>
<td>3</td>
<td>Performance expenditure</td>
<td>Total machine expenditures</td>
<td>M</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>Total direct expenditures</td>
<td>VL + NC + M + TT</td>
<td>T</td>
</tr>
<tr>
<td></td>
<td>General expenditures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Expenditures of survey, formulation of technical performance plan - estimate</td>
<td>Prescribed percentage x Z</td>
<td>K1</td>
</tr>
<tr>
<td>1</td>
<td>Expenditures of assessment and approval for technical performance plan</td>
<td>Prescribed percentage x Z</td>
<td>K2</td>
</tr>
<tr>
<td>2</td>
<td>Camp expenditure</td>
<td>Prescribed percentage x Z</td>
<td>K3</td>
</tr>
<tr>
<td>3</td>
<td>Expenditure of performance quality inspection</td>
<td>Prescribed percentage x Z</td>
<td>K4</td>
</tr>
<tr>
<td>4</td>
<td>Expenditure of destruction of detected bombs, mines and explosive materials</td>
<td>Prescribed percentage x Z</td>
<td>K5</td>
</tr>
<tr>
<td>5</td>
<td>Expenditure of acceptance, payment and finalization</td>
<td>Prescribed percentage x Z</td>
<td>K6</td>
</tr>
<tr>
<td>6</td>
<td>Expenditure of project or works management committee (if any)</td>
<td>Prescribed percentage x Z</td>
<td>K7</td>
</tr>
<tr>
<td>7</td>
<td>Expenditure of inspection or examination (if any)</td>
<td>Prescribed percentage x Z</td>
<td>K8</td>
</tr>
<tr>
<td></td>
<td>… Expenditure hi…</td>
<td>…</td>
<td>k…</td>
</tr>
<tr>
<td>8</td>
<td>Total estimate value:</td>
<td>Z + K</td>
<td>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.