
NGHE AN PROVINCIAL PEOPLE'S COMMITTEE
DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT

VIETNAM DAM REHABILITATION AND SAFETY PROJECT

REPORT
ENVIRONMENTAL AND SOCIAL IMPACT
ASSESSMENT (ESIA)
SUBPROJECT: REHABILITATION OF KHE SAN DAM AND
RESERVOIR – NGHE AN PROVINCE

Nghe An, May 2019

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**REPRESENTATIVE
OF THE PROJECT OWNER**

Nghe An, May 2019

EXECUTIVE SUMMARY

1. The “Rehabilitation of Khe San Dam and Reservoir” is one of the sub-projects being proposed for funding under the World Bank-assisted Dam Rehabilitation and Safety Improvement Project (DRSIP). The objectives of the subproject are: (i) to ensure the long term viability of the dam and reservoir; (ii) to ensure the safety of 1,800 people within the immediate downstream of the dam and the protection of 650 ha of agricultural and natural area, and downstream infrastructures particularly community buildings; (iii) to ensure stable water source for irrigation of 120 ha of rice and animal production. This environmental and social impact assessment (ESIA) was undertaken to comply with the World Bank's Environmental Assessment Policy and the Vietnam's Law on Environment Protection.

2. Khe San reservoir is located in Quynh Thang commune, 80km far from Nghe An city in the south. The reservoir was built in 1980. The catchment area of the reservoir is of 5.2 km², water storage capacity is of 1.47x10⁶ m³. The headwork cluster and auxiliary works (current condition) of the Khe San reservoir consist of following categories:

- *Dam*: It is homogeneous earth dam, crest length is 320 m. Dam crest is at 46m; width of 2.6-3.0m
- *Spillway*: It is an earth and broad-crested free spillway. The width of principal chute spillway: 23.6m, elevation of spillway: 44.23m.
- *Water intake*: Diameter of Water intake is 80cm (D80cm), Upstream elevation of water intake: 33.63m, Downstream elevation of water intake: 33.05m
- *Management and operation road*: It is Earthen road, Length: 145.8m, Width: 1.0-1.5m, Steep and difficult to walk during rainy season.

3. The current state of the dam does not guarantee safety. Over the 35 years, the earth dam has degraded with dam face now substantially reduced and crest height becoming uneven. The construction of this dam is of low quality with a crude trench that resulted in infiltration of water through the body and foundation of dam. The protective layer of quarry stone on the upstream face has been slipping while the protective layer of grass graft downstream face has been severely eroded. Moreover, the earth spillway which lies on the right side of the dam (100m from dam) has also been eroded and damaged, especially towards the side of the contiguous abutment and the downstream spillway. There is currently no management house/office on site or duly trained dam management staff. There is also no operating procedures and plans for flood prevention or emergency preparedness plan (EPP).

4. There are about 1,800 people within the immediate downstream of the reservoir, producing rice on 104 ha of land. A provincial road (598) pass through the area and serve as the life-line connecting the north of Nghe An with to the districts (Quynh Luu). The deteriorating condition of the dam also threatens the safety of these infrastructure as well as the lives and assets of downstream communities. In the recent years, due to the deteriorating condition of the reservoir, the water supply capacity has been reduced, adversely affecting the economic development of Quynh Thang Commune.

5. Rehabilitation and Upgrading Works: The proposed repair and upgrading works are based on the recommendations of the Dam Safety Assessment conducted on the dam. These include: the repair and upgrading of the dam body and foundation, reinforcement of the spillway, replacement of the water intake, construction of a small 90m² floor area management house, and the rehabilitation and upgrading of the existing management road. Sufficiently detailed plans for the sub-project repair works and their implementation have been prepared and served as the basis for this ESIA.

6. Environmental and Social Screening: Based on the Environmental and Social Screening, the sub-project is eligible for financing under DRSIP. The subproject is a Category B under the World Bank's classification. It is not located within or near any sensitive environment or natural habitat and there are no structures or sites in the area of cultural and historical significance that will be impacted by the rehabilitation. There are also no ethnic minorities in the area. The dam to be rehabilitated is by definition a small dam.

7. Environmental and Social Impacts: The sub-project when implemented will improve dam safety, protecting downstream infrastructure and the lives and assets of local people downstream of the dam. The repair and rehabilitation works will also ensure stable and reliable supply of irrigation water for the 104 ha of rice paddies, vegetables plots and aquaculture ponds, and supplement the existing groundwater source for domestic use of local people in dry season. However, there will also be some negative social and environmental impacts. These include: (i) loss of land, assets, crops and economic trees due to land and temporary construction easement requirements of the sub-project; (ii) likely interruptions in irrigation service during the dam repair which would affect crop production; and, (iii) other temporary impacts associated with construction activities.

8. A survey of the area indicated that about 1.0 hectare of land will be temporarily acquired during construction (The land is owned by the People's Committee of the Quynh Thang Commune). Portions of the land are covered with shrubs and low value trees

9. The other impacts associated with construction activities include: possible land degradation within the vicinities of the construction and quarry sites due construction spoils, boulders, materials and rubbish; increased concentration of particulate matter (mostly dust); elevated noise; increased sedimentation and turbidity of surface water; traffic disruptions; and, a slight increase in health and safety risks for the workers and local population due to exposure to hazards at construction site.

10. Mitigation Measures – An Environmental Management Plan (ESMP) has been developed as part of this ESIA to address these impacts. 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 Communication Plan, the Gender Action Plan, the Grievance Redress Procedure, the Chance Find Procedure, and the Unexploded Ordinance Procedure. Specific measures in the ESMP include, close consultation with the affected farmers for the optimal scheduling and timing of construction activities to minimize cropping disruptions, proper housekeeping at the construction site, disposal of construction spoils to a properly sited landfill, regular sprinkling of roads in residential areas during dry days, and the preparation and submission by the Contractor of its own Environmental and Occupational Health and Safety Plan for the construction site, incorporating construction-related measures and standard construction EHS practices such as wearing of PPEs, provision of adequate water and sanitation facilities at campsite, medical screening of workers, installation of fences and warning signs at dangerous areas and good community relations. The ESMP also requires the installation of a capacitated Dam Management Unit and the preparation of Emergency Preparedness Plan as recommended in the Dam Safety Assessment Report.

11. Consultation: Consultation meeting was held a Quynh Thang cooperative office, Quynh Thang commune in March 02, 2015 with 50 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 impact assessment consultation: Request PPMU applies measures and regulation on penalizing or terminating unilaterally with contractor, supervision unit if they do not obey adequate safety measures and timely propose environmental protection measures. Require the contractor must be committed to minimize the adverse impacts as per presents in Environmental and Social management and Monitoring plan. Social impact assessment consultation: 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. Proposing PPMU coordinates with consultant unit to organize times for disseminating information relating to subproject, propagandize for the local to understand the purpose as well as the benefits of subproject. The subproject's works must be done quickly and to be fished one by one before changing to the other items. Contractor and project owner are required to listen attentively the feedback from community to have corresponding reform. The ideas from community must be sent to organizations. Community supervision board. Commune People's Committee. PPMU and relevant organizations.

12. Resettlement Action Plan (RAP): The construction of the sub-project will temporarily acquire 10,000m² of land managed by the CPC for construction.

13. Risk of dam broken failure: If the dam is broken, the losses of lives and property of the people are immeasurable because currently the following infrastructures are protected by the Khe San dam: 123.26 km of access road, 6.8 km of canal route, 3 schools, 1 health centre, 1 administrative office, 6 transformer stations, 53.6km electric lines, there are about 1,800 people within the immediate downstream of the

Khe San reservoir, producing rice on 650 ha of land and a provincial road (N0 598) pass through the area and serve as the life-line connecting the north of Nghe An with to the districts (Quynh Luu).

14. Budget allocation: Both ODA fund and Counterpart fund of Vietnam Government are used for sub-project investment. The total estimated cost of the sub-project including implementation of the ESMP is VND 23,770,762,000. The environmental monitoring costs VND 275,274,000 and VND 145,349,000 for construction and operation phase respectively. The estimated training budget is VND 28,000,000 (USD 1,300).

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CHAPTER I. INTRODUCTION

The “Rehabilitation of Khe San Dam and 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 subproject.

1.1 Methods

1.1.1 *Environmental Impacts Assessment Methods*

The following methods were used:

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.

Environment Survey: This involves:

- Conducting a survey 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 subproject 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: The pollution factors of the World Health organization (WHO) was used 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 were used to quantitatively and qualitatively evaluate the impacts on the environment.

1.1.2 *Social Impacts Assessment Methods*

The following methods of social impact assessment were used:

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

Document Collection Method: In order to assess social impacts, the consultants have studied the following documents:

- The current policy and mechanism of the Government and of Nghe An province related to capital construction investment;
- The standards and regulations related to the subproject technical design;
- Feasibility study of the subproject “Rehabilitation of Khe San Dam and Reservoir, Nghe An province;
- The technical and environmental reports;
- The documents of topographical and geological survey of the subproject area;
- The documents and data on natural, socio-economic conditions of Quynh Thang commune, Quynh Luu district, Nghe An province;
- The survey data measured on the current environment status in the subproject area;
- Investment and technical design report, volume, budget estimates and drawings in March 2015;
- Statistical Yearbook of Nghe An province;

Field Survey Method: Conducting field survey in Quynh Thang commune. The experts/specialists used the prepared questionnaire to interview in combination with field survey method and focus group discussions, in-depth interviews local leaders, representatives the AP groups and beneficiaries. This activity helped to collect baseline information on the socio-economic conditions and characteristics of the people and subproject area, which served as the basis to propose appropriate measures to minimize direct and indirect adverse impacts by the project.

Household Survey: The consultants carried out the interviews to collect information on affected and benefited households individually. Beside multiple choice questions, there are also open-ended questions to get more ideas, while serving for the assessment and verifying the reliability of the information, considering the needs of support, rehabilitation and the risk of forced resettlement.

Sociological Survey Method: Taking survey, interviewing people around Khe San reservoir and leaders of Quynh Thang commune, households benefited from the supply of water from the reservoir.

Group Discussion Method: The leaders of Quynh Thang commune were communicated to make a plan for focus group discussions. A total of three group discussions were made with participation from representatives of HHs with the following criteria: AHs (direct, indirect), HHs with female headed HHs, particularly difficult circumstances household (elderly, disabled, policy family, etc.).

Rapid Rural Appraisal Method (PRA): Consultants used the PRA tools such as the crop cultivation calendar, land use map, and need/demand assessment to the community to help easily assess and identify the issues that need to be addressed on a priority basis related to raising awareness about the objectives, the positive effects and potential negative impacts of the project. Participants in PRA are affected groups and benefited groups of the project.

1.2 Consulting Agency

This ESIA was undertaken by a group of consultants from the Center for Environment and Development (CED) and the Institute for Water and Environment (IWE). Their contact details are as follows:

❖ **Center for Environment and Development (CED)**

No.122 - Le Hong Phong road– Vinh city - Nghe An province

Tel: 038.3560532/038.3838721

❖ **Institute for Water and Environment (IWE)**

No. 2, Lane 165, Chua Boc Street, Dong Da district, Hanoi

Tel/Fax: 04 35634809

Table 1.1. List of specialists

TT	Name	Experience	Position in ESIA implementing
1	Duong Thi Kim Thu	Planning specialist	Team leader
2	Hoang Thi Hoai Thu	Gender & Social specialist	Member
3	Phi Thi Hang	Resettlement specialist	Member
4	Le Phuc Hiep	Community Development specialist	Member
5	Nguyen Thi Xuan Thuy	Minority specialist	Member
6	Ngo Truc Nha	Ecology specialist	Member
7	Nguyen Nghia Ky	Irrigation specialist	Member
8	Nguyen Dang Bang	Economic specialist	Member
9	Nguyen Quoc Son	Social specialist	Member
10	Bui Thi Ban Mai	Environmental specialist	Member

CHAPTER II. SUB-PROJECT DESCRIPTION

2.1 Overview of the Sub-project

The Khe San reservoir was built in 1980 by state budget of local Government. In 2001, the water overflowed through the dam crest and after that the dam had been upgraded by using local budget. However, the headworks have been degraded and damaged reducing the irrigation design capacity and threatening the safety of downstream infrastructure, farms and communities. Over the 36 years (1980-2015), the earth dam has degraded with dam face now substantially reduced and crests height becoming uneven. The construction of this dam is of low quality with a crude trench that resulted water seepage through dam body and its foundation. The protective layer of quarry stone on the upstream face has been slipping while the protective layer of grass graft downstream face has been severely eroded.

Objective of the sub-project

- Ensuring the long term viability of the dam and reservoir;
- Ensuring the safety of 1,800 people within the immediate downstream of the dam and the protection of 650 ha of agricultural and natural area, and downstream infrastructures particularly community buildings;
- Ensuring stable water source for irrigation of 104 ha of rice and for domestic use and animal production.

Subproject Owner

Department of Agriculture and Rural Development, Nghe An province.

Address: N^o129, Le Hong Phong streets, Vinh city, Nghe An province

Representative: Mr Ho Ngoc Sy, Position: Director

Tel: 0383.835.993

Total investment:

Total investment for sub-project is 23,770,762,000 VND (Twenty three billion, seven hundred and seventy million, seven hundred and sixty two thousand Vietnamdong)

Location of the sub-project

Khe San reservoir is located in Quynh Thang commune, a mountainous commune of Quynh Luu district, Nghe An province. It is 90km far from Vinh city in the North. The geographical and administrative boundaries of Quynh Thang commune as following:

- The North borders on Nghia Hoi commune, Nghia Dan district;
- The South borders on Quynh Chau commune;
- The East borders on Tan thang commune;
- The West borders on Dong Hieu commune.

The headworks of Khe San reservoir were built in Khe San stream at the coordinates of 105056'35" E and 19026'41" N.

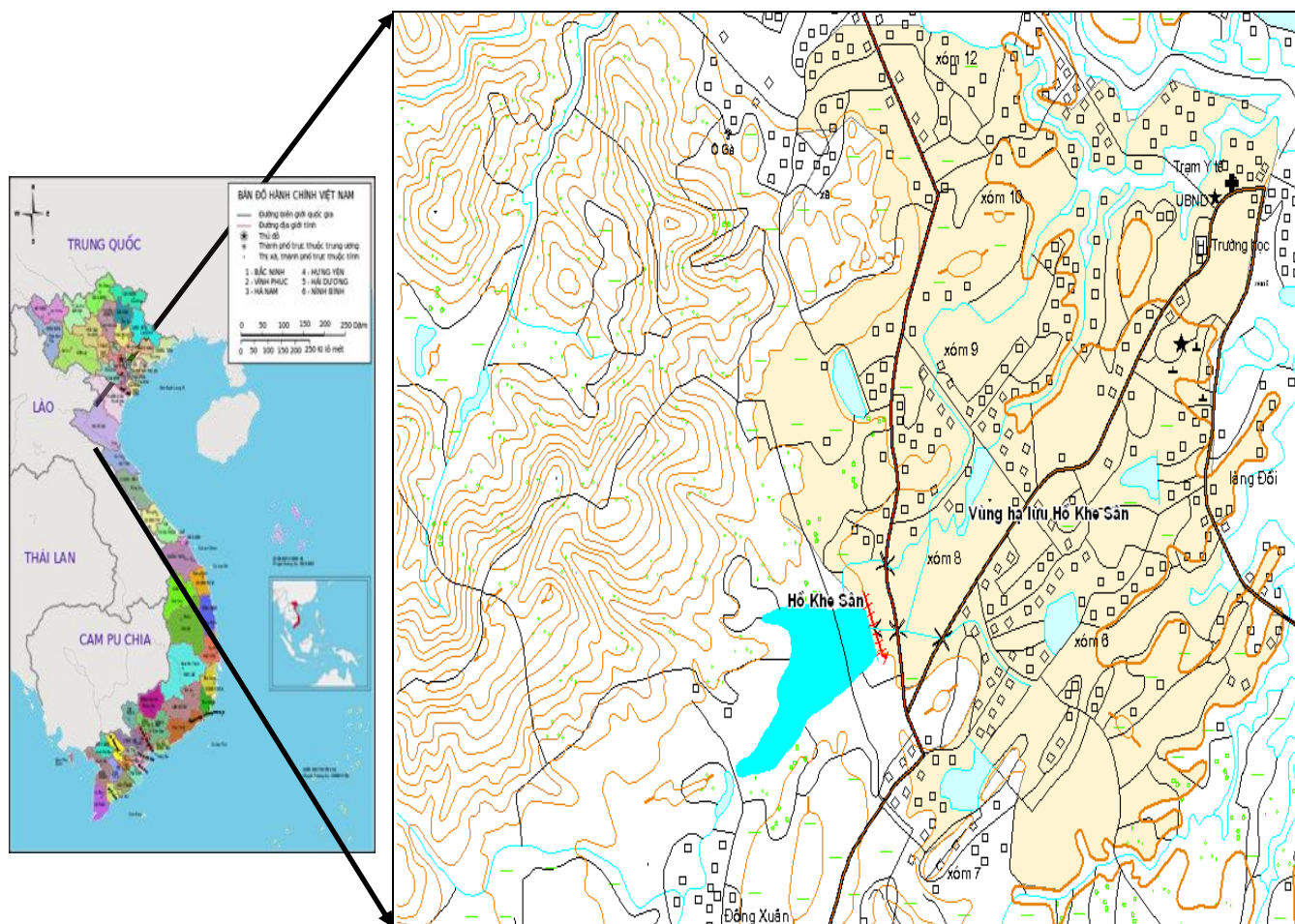


Figure 2.1: Location of Khe Sanh reservoir

2.2 The Sub-project Activities

2.2.1 Current status and Volume, Scale of items of the work and construction methods

Current status and Volume, Scale of items of the work and construction methods are shown in the following table:

Table 2.1: Proposed civil works

No	Items	Present Conditions	After rehabilitation
1	Dam	<ul style="list-style-type: none"> ➤ Length of Homogeneous earth dam is 320m ➤ dam crest height: 46m ➤ Crest width: 2.6-3.2m ➤ Upstream slope (m=3) has been eroded and damaged many places ➤ Downstream slope (m=2.5) has been not reinforced, some places has been eroded and infiltrated 	<ul style="list-style-type: none"> ➤ Length of Homogeneous earth dam is 389m ➤ Crest dam: 47.4m in height ➤ Crest width: 5m ➤ Upstream slope (coefficient m=3): It is reinforced by armored concrete and stone. ➤ Downstream slope (coefficient m=2.5): Cover with grass. Have drainage system at downstream slope and toe of embankment.
2	Water intake	<ul style="list-style-type: none"> ➤ Diameter of Water intake is 80cm (D80cm) ➤ Upstream elevation of water intake: 33.63m ➤ Downstream elevation of water intake: 33.05m 	<ul style="list-style-type: none"> ➤ Build a new water intake far from the old one is 5m (towards the right abutment) ➤ Upstream elevation of water intake: 35.0m. ➤ Upstream elevation of water intake: 34.9m ➤ Steel pipe $\Phi 600$, and is covered by concrete M250 ➤ Open/Close with valve at downstream.
3	Spillway	<ul style="list-style-type: none"> ➤ -The width of principal chute spillway: 23.6m ➤ -Elevation of spillway: 45.3m ➤ -Spill training walls is reinforced by brick, but many places are broken and eroded 	<ul style="list-style-type: none"> ➤ -Expand the width of principal chute spillway to 27m ➤ -Elevation of spillway: 44.5m ➤ -Crest width of spillway: 5m
4	Management Road	<ul style="list-style-type: none"> ➤ Earthen road ➤ Length: 145.8m ➤ Width: 1.0-1.5m ➤ Steep and difficult to walk during rainy season 	<ul style="list-style-type: none"> ➤ Concrete road M200 and 20cm thickness, ➤ Length: 152m ➤ Width: 5m, pavement width: 3.0m ➤ Slope <10%
5	Management House	Not yet built	<ul style="list-style-type: none"> ➤ Construct a non-floor house with the area of 52.5m² to serve as management house. ➤ It is located at downstream area and far from left abutment is 100m.

2.2.2 The volume of construction works and transportation

Table 2.2. Majors construction volume

No	Items	Volume
1	Excavated soil	102,057 m ³
2	Excavated rock	27 (m ³)
3	Filled soil	56,520 m ³
4	Concrete	2,408 (m ³)
5	Formwork	13,839 (m ²)
6	Steel	63,777 kg
7	Rocks	6,286.9 m ³
8	Sand	493 (m ³)
9	TS40 fabric filter + bags asphalt load	7,40 (m ²)
10	Brick	70 (m ³)
11	Motar	997 (m ²)

[Source: FS report]

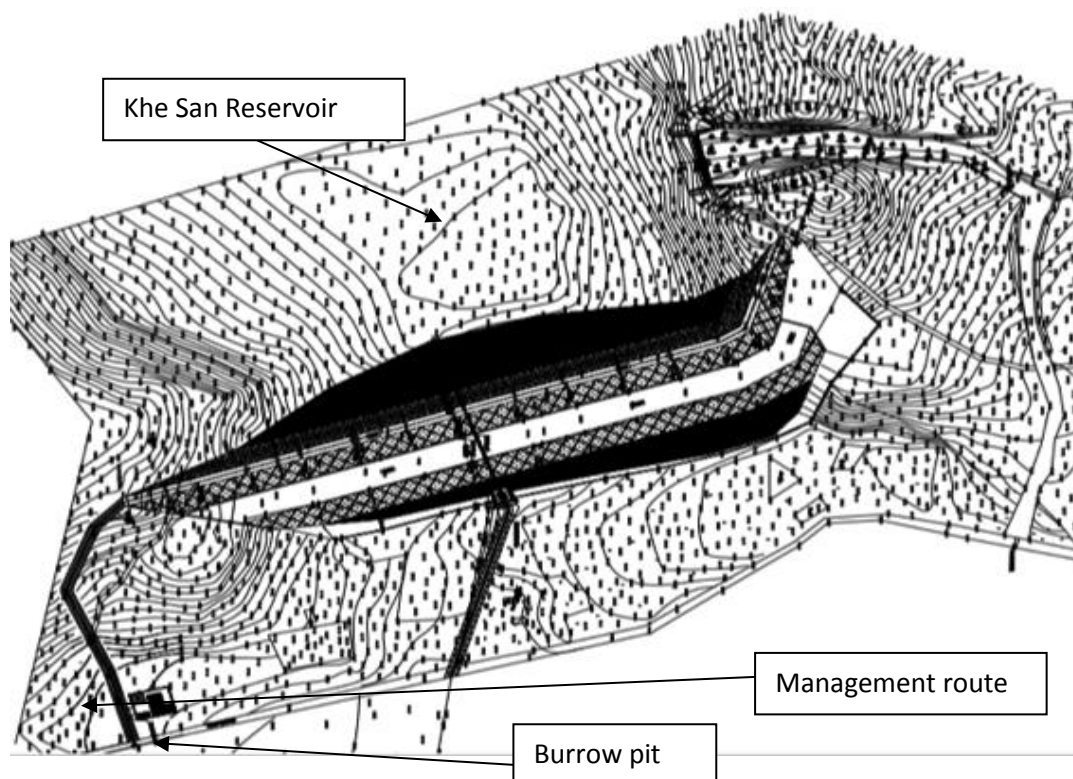


Figure 2.1 Overall project and location of burrow pit exploited

Table 2.3. Estimated transporting stone and construction materials activities

Items	Location	Quantity (exploring capacity)	Distance to construction site, transport routes
Burrow pit	Village 7 , Quynh Thang commune	40.000 – 50.000 m ³	500m
Quarry	Purchased at Quynh Xuan commune	Ensure sufficient workload.	25km
Landfill	Village 7, Quynh Thang commune.	15000m ³ , Area: 1ha	400-500m
Construction materials supply	Cau Giat town, Quynh Luu district	Ensure sufficient workload.	25km
Regrouping sites of construction materials	On the left abutment of the dam	Area: 1000m ²	50m

2.2.3 The list of machinery and equipment for construction

Table 2.4. Table List of machinery, and equipment








Name	For use in	Quantity
Excavators	Work and material excavation	1
Excavator bucket	Work and material excavation	2
Foot compactor	Soil and concrete rammer reach the technical requirements	2
Dump Truck	Soil, stone, material transportation	5
Tilting car 5T	Material transportation	5
Tandem drum vibrating roller	Rammer	2
Concrete mixer	Mixing concrete in construction	3
Stick vibrator	Concrete, dam rammer	2
Vibrating plate compactor	Concrete, dam rammer	10
Jumping Jack Compactor	Concrete, dam rammer	05
Sprayer	Moisturizing structures constructed	01
Bulldozer (110 CV)	Levelling construction	03 + 01 back up
Generator	Ensure electric for construction	2
Water pump	Foundation pumping	2

**All machinery and equipment are expected to be in good working conditions as will be required under the contractor's contract.* [Source: FS report]

2.3 The Construction Timetable

Construction will be implemented within 18 months.

Table 2.5. Expected for progress

Items	Construction time (2018-2019)																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Preparing construction site, temporary road and camp																		
Construction the managent road and transportation of materials																		
Installing dike, digging diversion canal, digging pit, stripping weathering																		
Constructing water intake and operator house																		
Constructing earth dam (upstream and downstream slop)																		
Constructing spillway																		
Constructing management house																		

Completing and handing over the work																			
---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

The major items of construction are implemented in dry season. Therefore, the works related agricultural production is not affected much.

CHAPTER III. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORKS

3.1 Country's Environmental and Social Safeguards Policies and Legislations

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

3.1.1 *Environment*

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

1. The Ministry of Natural Resources and Environment shall prepare the national-level planning for environmental protection.
2. People's Committees of centrally-governed cities and provinces (hereinafter referred to as provincial People's Committee) shall take charge of formulating processes or preparing the local planning for environmental protection.

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

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

Inspection and approval of the planning for environmental protection shall be required as follows:

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

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

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

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

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

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

According to Article 21 of LEP, the consultation to be required in the process of environmental impact assessment is aimed at completing the report on environmental impact assessment. It emphasizes 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 of 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.

3.1.2 Dam safety regulations

Decree no.72/ND-CP on date 07/05/2007 of the government of Vietnam regarding on dam safety management. According to the decree, a big dam is the dam with the height calculating from the floor face to the top of the dam equal to or greater than 15 meters or dam of water reservoirs with the scale of capacity equal to or greater than 3,000,000 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).

3.1.3 Land acquisition

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

- Constitution of Vietnam 2013
- The Land Law 45/2013/QH13 which has been effective since July 1, 2014

- Decree No.43/2014/ND-CP dated on May 15, 2014 guiding in detail some articles of Land Law 2013
- Decree No.44/2014/ND-CP dated on May 15, 2014 provides on method to determine land price; make adjusted land price brackets, land price board; valuate specific land price and land price consultancy activities
- Decree No. 47/2014/ND-CP dated on May 15, 2014 providing compensation, assistance, resettlement when land is recovered by the State
- Decree No. 38/2013/ND-CP dated on April 23, 2013, on management and use of official development assistance (ODA) and concessional loans of WB
- Decree No. 72/2007 / ND-CP dated on May 07, 2007 of the Government on management of dam safety
- Decree No. 201/2013 / ND-CP dated on November, 27, 2013 of the Government detailing the implementation of some articles of the Law on Water Resources
- Circular No. 36/2014 / TT-BTNMT dated on 30 June 2014, regulating method of valuation of land; construction, land price adjustment; specific land valuation and land valuation advisory
- Circular No. 37/2014/TT-BTNMT dated on 30 June 2014, regulating compensation, assistance and resettlement when the State acquires land
- Decision No. 1956/2009/QĐ-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/QĐ-TTg, dated on November 16, 2012, on the assistance policies on employment and vocational training to farmers whose agricultural land has been recovered by the State
- Others.

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

3.1.4 *Indigenous/Ethnic minority people*

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

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

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

3.2 National Policies and Regulations

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 ensure compliance specified in the approval of their report on EIA. For any change, the project owner must send their explanation to PPC (Ref. Article 26 of LEP).
- PPMU will have to notify PPC and the rehabilitated dam will be commenced only after the agency in charge of the approval of the report on environmental impact assessment has inspected and certified the completion of environmental protection works (Ref. Article 27 of LEP).
- PPMU will prepare a completion report for environmental protection work and within 15 days of receiving the report, PPC must examine and issue the certificate of completion of environmental work (Ref. Article 28 of LEP).
- The inspection of environment protection works serving the operation phase of the subproject shall be carried out by an Inspectorate which is established by the Head of PPC (Ref. Article 17 of Decree).

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

3.3 World Bank Safeguard Policies

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

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

3.4 World Bank Safeguard Policies

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' depending on the extent, scope and impact of the specific subproject.

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

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

The project may intervene in areas where indigenous people live (specific subproject locations will be determined during implementation). In addition, the project may require land acquisition

and resettlement. As such, an Ethnic Minority Policy Framework (EMPF) and Resettlement Policy Framework (RPF) are required for the project and will be prepared separately.

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

The WBG guidelines provide guidance on certain EHS issues, which include standards for environmental parameters (ambient air quality, water and wastewater quality, noise level, waste management), hazard and accident prevention, occupational and community health and safety (during commissioning and decommissioning works) etc. These guidelines will be directly applicable to the proposed project. As a general rule, the WBG guidelines should complement the existing Vietnam guidelines or standards. In case the Vietnam guidelines or standards differ from the WBG guidelines, project is expected to follow the more stringent ones.

The World Bank access to information policy would be directly followed. The project will make the environmental/social assessment and ESMF documents available to the public by publishing it in their websites. In addition, Hard copies of these documents in English (including Vietnamese language) will be made available in the PMU and all PPMUs.

CHAPTER IV. BASELINE ENVIRONMENT AND SOCIAL CONDITION IN THE SUBPROJECT AREA

4.1 Natural Environment

4.1.1 *Geographic location of Khe San dam*

As described earlier, the Khe San Dam is located in Quynh Thang Commune of the Quynh Luu District in the Nghe An Province. The following are general geographical description of the area:

Nghe An Province - Nghe An is located in the heart of North Central region, stretched along the North to South Highway and East - West highway, 300km from Hanoi capital to the South. Along the road No.8, it is about 80km to Viet – Lao border and nearly 300 km to Lao – Thailand border. There are different kinds of transportation in Nghe An: road, railway, navigation, airway, and sea route. Besides the 419 km length border and 82km length of coastline, Nghe An also has Vinh Airport, Cua Lo Port which is being upgraded and expanded and new infrastructure development projects have been undertaken which has positively affected the Nghe An both economically and socially. The province is also situated northeast of the Truong Son mountain range, which has a gradual slope from northwest to southeast. The natural area of province is 1,648,729ha, with $\frac{3}{4}$ area of mountains, mainly located in the west of the province. Narrow plain is only 17% of total area from South to North, facing the East Sea and surrounded by mountains. The terrain of province is divided by a dense river network and mountain range causing significant obstacles in developing a suitable transportation system.

Quynh Luu District - Quynh Luu is a coastal plain district, with 43,762.87ha of natural area, 279,977 of population (04/2013); 33 administrative units (including 32 communes and 1 town). It is 60km far from the province central district Cau Giat town. The South border of Quynh Luu district is Hoang Mai town, the East borders on the East sea, the West borders on Tan Ky district and Nghia Dan district, the Southwest borders on Yen Thanh district, the South borders on Dien Chau district.

Quynh Thang Commune: Quynh Thang is one of the mountainous communes of Quynh Luu district. The geographical and administration boundaries are:

- The East borders on Nghia Thuan and Nghia Hoi commune (Nghia Dan district);
- The West borders on Quynh Lam commune;
- The North borders on Tan Thang commune;
- The South borders on Quynh Chau commune.

The total natural area is 3864ha. The commune is divided into 24 villages with 7km long and 3.5km wide. The population is 8889 people with 1935 households.

4.1.2 *Climate and hydrology*

- Climate and meteorology

The subproject area has characteristic of tropical monsoon, called North Nghe An – South Thanh Hoa climate. There are two seasons in a year. Rainy season is from July to November; Dry season is from December to next June. There are two meteorology stations near the subproject area namely Quynh Lau and Tay Hieu. Table 4.1 shows some meteorology characteristics of Quynh Luu meteorology station.

Table 4.1. Meteorology characteristics of Quynh Luu meteorology station

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------

Temperature (deg-C)	17.4	17.9	20.2	23.7	27.3	29	29.2	28.2	26.8	24.4	21.4	18.5	23.7
Hours of sunshine	87	58	76	134	223	203	227	189	175	162	152	114	1,772
Humidity (%)	86.3	88.5	90.2	89.9	85.3	81	79.7	84.5	87.1	85.5	83.6	83.3	85.4
Precipitation (mm)	19.9	23.4	30.0	55.1	106	129.7	125.1	2487	419.6	333.1	82.9	33.2	1,606.6

- Evaporation

+ The highest year evaporation: 1,055mm

+ The lowest year evaporation: 654mm

+ The mean year evaporation: 915mm

-Hydrology

The basin of Khe San reservoir is in 5.2 km². Dong Ngan is the stream which usually supplies with water starting from Dong Ngan Mountain which is 2 km in length. Besides, the non-usual water input is rain water.

The data of Khe La and Khe San meteorological stations was used to assess the hydrological characteristic for the basin. The calculation results of Khe San are:

Flow discharge in the design year $Q_{P(10\%)} = 0.069 \text{ m}^3/\text{s}$.

Flood flow discharge $Q_P(1\%) = 88.54 \text{ m}^3/\text{s}$, total flood volume $W_P(1\%) = 1.64 \cdot 10^6 \text{ m}^3$. This amount of water is the main reason of increasing water level in the reservoir up to 45.7m and with a high potential of overtopping (Dam crest before rehabilitation is 46m in the current condition). The design high flood level of reservoir is 48.2m after rehabilitation.

Table 4.2. Hydrological year-based flow distribution in Khe San basin (in m³/s)

Month	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	VI	VII	VIII	Avg.
Khe La	1.24	0.40	0.22	0.12	0.08	0.10	0.08	0.10	0.18	0.36	0.12	0.24	0.270
Khe San	0.32	0.10	0.06	0.03	0.02	0.03	0.02	0.03	0.05	0.09	0.03	0.06	0.069

Water resource of Khe San reservoir is unregulated fed by natural waterways of Dong Ngan creeks. The annual average flows of to the reservoir is 0.15-0.2 (m³/s) or per year and mostly in rainy season (May to Jul), there is no flow into reservoir during dry season.

Annual peak flood discharge to Khe San reservoir is, mainly occur in September to November, the designed flood peak discharge is $Q_{1\%} = 88.54 \text{ m}^3/\text{s}$. Annual water discharge depends on total water coming into the reservoir, with frequency of $P=10\%$, total water flowing into reservoir in case of flood is $M = 1.64 \times 10^6 \text{ m}^3$. This amount of water is the main reason of increasing water level in the reservoir up to 45.7m and highly potential overtopping (Dam crest before rehabilitation is 46m-current condition), but this is in safe condition, because the designed high flood level of reservoir after rehabilitation is 48.2m.

In case of discharging flood water out of Khe San reservoir, the flow goes freely to the spillway via the spillway channel with length of $L=1.5 \text{ km}$ which is connected to the Khe Coc stream with length of 4.6 km and then discharges to the Hoang Mai river, which finally emptied into the sea.



Figure 4.1 *Canal behind spillway*

Cross section of spillway is trapezoid shape with B(width) = 1.5-4m, H (high) = 1.5-5.0m

The flow behind the spillway of Khe San reservoir-Khe Coc stream is occur only during the rainy season with $Q=0.15\text{m}^3/\text{s}$ and total dry-up in dry season. Currently, there is no data show the natural flow when there is no flood water discharged through the spillway. In many years of operations of the Khe San reservoir, the a stream behind the spillway of Khe San reservoir have never been overflown as the result of flood water discharge from the Khe San reservoir. On the other hand, there is no significant ecosystems along to the stream and less economic valuable. The vegetation covers are shrubs and plantation trees such as acacia, cajuput. There is only common species exist such as are carp fish, and other reptiles. There are no rare animals or special species that need to be reserved. Also, there is no local households living in the areas, so that releasing of floodwater have no impact to local people or infrastructures in downstream areas

Cac Cu weir is a small reservoir ($0.5 \times 10^6 \text{ m}^3$) located 2 km from the main dam and it supplies water for agricultural production of villages no. 9 and no. 10 of Ngoc Son commune. In 2013, top flood event occurs, the weir did not handle, and failure , the right abutment of dam was broken and led water overflow to cultivation fields, most crops have been damaged and lost fishery cultivation, but no human life lost recorded. Ecosystems in Cac Cu and Khe Coc reservoirs are quite simple and there is only common species. The floral includes shrubs, grass.

The maximum depth of water in receiving channels is 0.7-1.5m. However, during dry season (From May-Jul) the depth of water is completely dry-up.

-Natural Disaster

The subproject is located in a region prone to natural calamities brought about by hurricanes, tropical low pressure, flood, drought, whirlwind, thunderstorm, etc.

Storm and tropical low pressure: The subproject area is affected by 1 to 2 storms annually. It often occurs in the period from August to October. The highest wind velocity is at 12-level.

Flooding: In recent years, heavy rains have occurred more often in Quynh Luu district, especially the historical floods in the years 2000 and 2013 cause heavy losses of people and property.

Drought: Drought and water shortage often occurs in the region in dry season and is increasing recently. The unusual heat wave occur often and increase in intensity leading to drought and causes extensive damages to agriculture.

Damaging cold: The abnormal damaging cold has occurred recently causing extensive damage to agricultural production and people's life. The typically damaging cold was in 2008, 2010-2011, 2013-2014.

Hurricanes: Due to the impacts of climate change, natural disasters such as hurricanes occurred more often in Nghe An province in recent years. There have been deaths of these extreme weather.

4.1.3 **Topography**

Nghe An province is located in the North East of Truong Son mountain where the topography is complicated and separated by systems of mountains and rivers, leaning towards North-West and South-East directions. The highest peak is Pulaileng (at the elevation of 2,711m) in Ky Son district; the lowest land is the delta of Quynh Luu, Dien Chau, Yen Thành. Some locations are as low as 0.2 m above mean sea level. The natural elevation of the region is ranging from 40m to 100m. The beneficiary is located in the medium high mountain and semi-mountainous area at the elevations of 20 - 30m.

The field geological survey found that the project area has 8 main formations upwards with predominant characteristics of precipitated sand containing some quartz pebbles and sandstone and cement grey colored and yellow-grey clay schist.

4.1.4 **Geology**

Flood spillway of Khe San was built in the mountainous channel to the left of dam, on the rock layers along flood spillway. The bedrock exposed on the surface is favorable condition for stability of spill base.

4.1.5 **Water environment**

- Surface water

Water quality survey was conducted by the Centre for Environment and Development in collaboration with the Station of Labour Monitoring and Environment Analysis under the National Institute of Labour Protection. The surface water samples were taken at the locations as in following table:

Table 4.3. Location of surface water sampling

No.	Sample code	Location	Coordinate
1	NM1	In the reservoir on the side of flood spillway	N:19°15'50,5" E: 105°33'54,5"
2	NM2	In the reservoir near the water intake	N:19°15'43,7" E: 105°33'57,1"
3	NM3	Channel after the intake	N:19°15'46,7" E: 105°34'01,8"

The locations of water sampling in Khe San reservoir are shown in following figure:

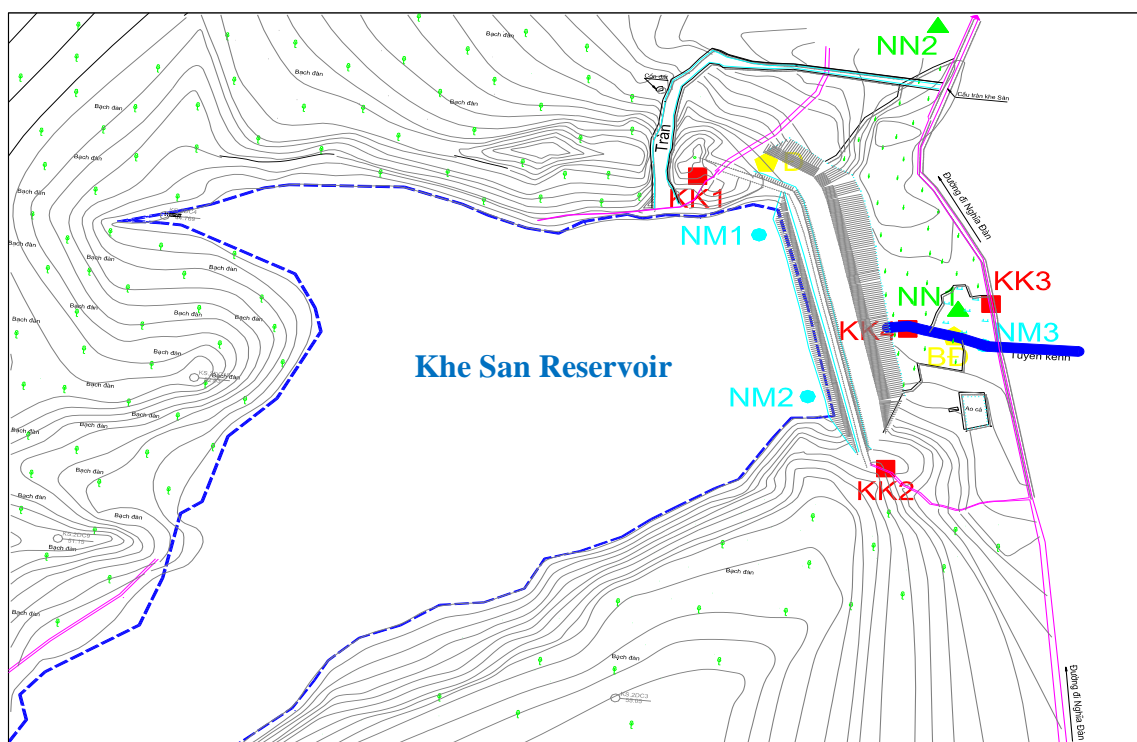


Figure 4.2 *Water sampling locations*

According to measurement and analysis results, the surface water quality parameters during the time of survey were within the national standards. Therefore, there is no signal of surface water contamination in the subproject area. Results of water analysis are shown in Table 4.8.

Table 4.4. Results of surface water analysis

Parameter	Unit	Results			QCVN 08: 2008/BTNMT (A2)
		NM1	NM2	NM3	
pH	-	6,5	6,6	6,9	6-8,5
Temp	°C	26,3	26,7	26,4	-
BOD ₅	mg/l	4,5	4,5	5,0	6
COD	mg/l	9,8	8,5	9,1	15
DO	mg/l	6,9	5,8	6,6	≥5
TSS	mg/l	25	29	25	30
Ammonium	mg/l	0,18	0,12	0,09	0,2
P	mg/l	0,16	0,14	0,12	0,2
N	mg/l	3,3	2,9	2,8	5
As	mg/l	KPH	KPH	KPH	0,05
Hg	mg/l	KPH	KPH	KPH	0,001
Pb	mg/l	KPH	KPH	KPH	0,02
Cd	mg/l	KPH	KPH	KPH	0,005
Coliform	MPN/100ml	3,697	4,985	3,108	5000

KPH: Undetected

- *Groundwater*

According to measurement and analysis results, the criteria of ground water quality at the survey time are also within the allowable limits. Therefore, there is no indication of ground water contamination in the subproject area. The samples of ground water were taken at the locations as in table 4.5. And the analysis results are shown in table 4.6.

Table 4.5. Locations of ground water sampling

No.	Sample code	Location	Coordinate
1	NN1	Dug well of Ms. Ho Thi Hong's family beyond the dam foot	N:19°15'47,6" E: 105°34'01,0"
2	NN2	Dug well of Mr. Tran Duc Thuy's family beyond the dam foot	N:19°15'57,6" E: 105°33'59,6"

Table 4.6. Results of ground water analysis

Parameter	Unit	Results		QCVN 09:2008/BTNMT
		NN1	NN2	
pH	-	6.3	6.2	5,5 – 8,5
Turbidity*	NTU	1	2	-
EC	s/m	25	23	-
DO	mg/l	4.7	5.1	-
TSS	mg/l	2.3	3.5	1500
Hardness	mg/l	65	58	500
Zn	mg/l	0.45	0.2	3.0
As	mg/l	KPH	KPH	0,05
Hg	mg/l	KPH	KPH	0,001
Pb	mg/l	KPH	KPH	0,01
Cd	mg/l	KPH	KPH	0,005
Coliform	MPN/100ml	KPH	KPH	3

4.1.6 Air environment

Air samples were taken from 4 locations to assess the current status of air quality in subproject area (Table 4.7 and 4.8). According to measurement and analysis results, the criteria of air quality in the sub-project area at the survey time are within the allowed limitation. It may be noted that Air quality survey was conducted by the Centre for Environment and Development in collaboration with the Station of Labour Monitoring and Environment Analysis under the National Institute of Labour Protection. Thus, there is no signal of air pollution in the subproject area.

Table 4.7. Locations of air sampling

No.	Sample code	Location	Coordinate
1	KK1	In the South of the dam	N:19°15'51,4" E: 105°33'54,5"
2	KK2	In the North of the dam	N:19°15'42,8" E: 105°33'58,3"

3	KK3	Next to the road	N:19°15'47,0" E: 105°34'01,5"
4	KK4	Canals after dam	N:19°15'46,7" E: 105°34'01,8"

Table 4.8. Results of air sample analysis

TT	Location	Dust	SO ₂ *	NO ₂ *	CO*
		(µg/m ³)			
1	KK1	103	60	33	<5.000
2	KK2	116	58	30	<5.000
3	KK3	172	63	35	<5.000
4	KK4	153	62	33	<5.000
QCVN 05:2013/BTNMT		300	250	200	30.000

Table 4.9. Results of physical parameter analysis

Location	Noise (dBA)	Temperature (°C)	Humidity (%)	Wind speed (m/s)	Vibration * (dB)
KK1	45	21.4	80	0.5-0.8	27
KK2	46	21.2	77	0.8-0.9	26
KK3	44	19.0	80	0.7-0.9	33
KK4	50	19.0	80	0.8-0.9	33
QCVN26:2012/BTNMT(from 6:00 to 21:00)	70	-	-	-	-
QCVN27:2010/BTNMT(From 6:00 to 21:00)	-	-	-	-	75

For PM_{2.5}: The subproject area is located in rural area with low population density. PM_{2.5} is expected to rise due to transport vehicle emissions. However, there is limited transportation throughout the subproject area. Therefore, the potential pollution of PM_{2.5} at the survey time is likely to be within allowable limits.

4.1.7 Soil environment

The soil sample (Đ1) was taken at the south of the dam, at the coordinate of N:19°15'51.4" & E: 105°33'54.5".

According to analysis results, all the parameters of soil sample are within the allowable limits of QCVN 03: 2008/BTNMT – technical standard for soil environment quality. There is no indication of soil contamination in the subproject area.

Table 4.10. Results of soil analysis

Parameter	Unit	Result of Đ1	QCVN 03:2008/BTNMT
Cd	mg/kg	0,016	2
Pb	mg/kg	0,04	70
As	mg/kg	KPH	12
Zn	mg/kg	9	200

Cu	mg/kg	1,7	50
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4.2 Biology Environment

4.2.1 *Flora*

There are no national parks, nature reserves or important ecological system within or around the dam area. In Quynh Thang commune, the flora consists mainly common plant species such as Eucalyptus, Acacia, and Melaleuca; other perennial plants and shrubs. There is no natural forest. The area is also not known to have any rare and/or endangered plant species and this was confirmed during the site inspection and interviews with the local people.

In upland regions, the farmers in the sub-project area have been engaged in intensive production of upland rice and upland crops for long time. The varieties of rice planted by farmers however have changed over the years, increasingly towards varieties that are suited to soil and climate conditions of the region. Rice are typically planted in spring and winter season with average yields of 400-500 kg per ha. Together with rice, other seasonal crops and food crops such as corn, potato, and certain kinds of melon are also planted.

Receiving water discharge from Khe San reservoir is a stream of 1km long flowing to a downstream reservoir named Cac Cu reservoir. This area is not inhabited, just only for rice-growing of households from 4, 9, 10 village.

4.2.2 *Fauna*

Fauna diversity is relatively poor in this area. There are only a few species of birds (e.g., crows, sparrows, etc.), small reptiles (e.g. lizards, snakes, etc.) and insects (e.g. bees, locusts, grasshoppers, praying mantis, etc.). The area is not known to harbor any endangered or rare terrestrial species of fauna and this was confirmed during the site survey and interviews with the locals.

The aquatic species: The reservoirs are used to supply water for domestic use and agriculture purposes. Ecology system in reservoir include only common species such as carps, snake-heads and shrimps. Animals in receiving water include fish, frog. There are no endangered or rare aquatic species in the reservoir.

4.3 Socio-Economic Environment

4.3.1 *Population*

It is recorded by Quynh Thang commune in 2013 that the total population of the commune is 8,889 in equivalent to 1,935 households. (Male: 4,000 and female: 4,889). The average family size is 4.6 people. The population density is 215 people per km². The population of labor age is 5,296 (making up nearly 60%), including male: 2,646 and female: 2,650. The labor beyond labor age (<16 and >60): 3,593 (making up more than 40%). The evaluation showed that the labor force in the commune is rather abundant who are mainly high secondary junior graduates; some are trained through vocational schools. They basically meet labor demands of agencies and enterprises in the commune.

Labor distribution in different economic sector: In general, the key livelihood of local people in Quynh Thang commune is agriculture (>66%). The main agriculture production is two rice crops and one upland crop year round.

4.3.2 *Socio-economic conditions*

Socio-economic conditions in the commune: Quynh Thang commune is a mountainous commune with total natural area of 3864 ha, covering 24 hamlets. In the past, Quynh Thang is a neglected region with only ethnic minorities living near streams and rivulets. So far, Quynh Thang commune has 24 hamlets (with more than 9,000 people) and 2 agriculture cooperatives

of Dong Tam (covering 8 hamlets) and Tien Thanh (covering 13 hamlets). There are 3 hamlets: Đông Xuan, Quynh Long, Trung Tiến (Thai ethnic minority).

The economic growth rate in 2014 is 19.7% with the contribution of 60% from agriculture, forestry and aquaculture; basic construction 9.6% and service 20.6%.

Table 4.11. Summary of basic information on socio-economic conditions

Parameter	Values
Natural area	3,867 ha
Agriculture land	1,096 ha (28.35%)
Population	8,889 people
Raito of ethnic minorities	Kinh: 96.6%; ethnic minorities: 3.4%
Average annual income per capita	VND 17.9 million

Source: Statistical data of Quynh Thang commune - 2014.

- Infrastructure:

In general the rural infrastructure of Quynh Thang commune is not developed. There is such main road as Provincial road no. 598 with total length of 1.5 km across the commune; the road is 6m wide built on gravel aggregate and the roadway is 3.5 m (stretching from hamlet 1 to 6 and 7 of Dong Tam). The commune has inter-commune and commune road with total length of 21.1 km, including 15.2 km of degraded asphalt road. However this road is narrow and fails to meet technical specifications of Ministry of Transport. Inter-village roads are earthen roads which hinders travel and transport during rainy season as it becomes slippery.



Figure 4.3 Main road of Quynh Thang commune

The commune does not have common infrastructure, however all villages have village cultural house where local people convene community meetings. All project related issues are shared and discussed in these meetings.

- Electricity system: The electricity supply system basically meet consumption demands of local people. Some locations receive weak electricity supply during peak hours as they are located at the end of the system. The district electricity agency is in charge of this commune. The commune has 6 sub-stations with total capacity of 960 KVA. All of them are in good conditions (100%); new construction is required for 6 sub-stations with total capacity of 720 KVA. The medium voltage cables is 5 km long which is in good condition (100%); a new 3 km of electricity line should be erected. The low voltage cables is 5 km long with 48.6 km need

upgrading (100%). Total electricity users is 1,772 households; the access to safe electricity supply in the region is 100% of households.

Water use and management of hydraulic works: water from Khe San reservoir is supplied to agriculture (key user) and to aquaculture (some aquatic species). It is surveyed that water in Khe San reservoir has never been depleted since its construction. At present, Khe San reservoir is being managed and operated by Quynh Thang Agriculture cooperative. This cooperative also managed all reservoirs and hydraulic works in the commune.

Safety of the reservoir: Khe San reservoir was built before 1980. After 35 years of operation, the reservoir has been seriously degraded. However, no dam failure or unsafe condition has been observed which might have led to cease of operation of the reservoir.

4.3.3 Cultural and social condition

Tangible and intangible cultural assets: Quynh Thang commune does not possess archeological area or cultural or historic relics. There are only some pagodas and temples and churches in the commune. None of them are located near the project (within 2km distance) or on the transport way of construction materials or waste.

Religions: like other communes, the politic system of Quynh Thang has a full set of society unions as Women union, Youth union, veteran union, farmer union, elderly union, red cross union. Wide participation of women is observed in all these unions. Most of local people in Quynh Thang commune are Buddhists; few are Christians (5% of the commune population).

Health care: Quynh Thang is a commune meeting national standard relating to health care service. The commune clinic station has 1 doctor, 1 under-graduate doctor 2 physicians, 4 nurses and midwife. At present commune clinic station is planned to be a two story building with 10 rooms and a precinct of 4,280 m². The ratio of local people participating in different types of health insurance is 25%. The health care service meets new rural area standards.

Education: the coverage of secondary education: total pupils attending secondary education is 626/626, or 100% as planned. The ratio of pupils passing secondary education and continuing to high secondary schools or vocations schools is 99- 100% annually. The ratio of rural labors who are trained and provided with vocational certificates (3 month certificate) is 7%. The commune provides 3 levels of education: kindergarten, primary schools and secondary schools. Total pupils in the commune are 1,388; total school area is 36,164 m²; 3/3 schools are of national standard.

4.3.4 Other social services

Gender and role of women: gender related activities in the commune are well implemented. There is no significant gender inequality observed in the commune. Big tasks in the family are often discussed and jointly decided by both women and men. Women often take care of household works. They also actively participate in social activities as movements or propaganda in the commune. Women's participation is observed in social unions and state agencies such as People's Committee, commune clinic station, schools. It is estimated that the ratio of women in social unions and state agencies is 30%.

Labors and employment: the seasonal migration for part-time jobs is popular for both men and women, when women tend to work locally and men tend to work in other districts/provinces (mainly in industrial zones in the South or work as exported labors). As a result agriculture laborers are mainly old and young people which should be taken into consideration by the project.

Family size: the family size of a female headed family is smaller than a male headed one, however this difference is in-significant (4.59 people vs. 4.91 people) (see below table):

The average family size

Item	Average family size	Family size (%)			
		1-2 people	3-4 people	5-8 people	>9 people
Total samples	4.6				
Male headed households	4.91	29.7	37.3	32.5	0.5
Female headed households	4.59	28.6	26.9	26.5	18.0

(Source: Surveyed data in January 2015)

Income and poverty: The survey of all 5 income groups in female headed households and male headed households showed that the lowest income group (group 1) the households headed by female are more predominant than those headed by males (15.5% compared to 10.3%). This showed that the financial capacity of female headed households is as good as those headed by males. Women are the disadvantaged in the project area.

Table 4.12. Income groups by gender (%)

Item	Income group					Total
	Group 1	Group 2	Group 3	Group 4	Group 5	
Male headed households	10.3	2.0	38.2	28.0	21.5	100.0
Female headed households	15.5	5.0	35.5	26.7	17.3	100.0

(Source: Surveyed data in January 2015)

Living standard: local people think that their living standard is average or rather poor due to unfavorable natural conditions for agriculture production. By gender, much more households having female heads are poor than those having male heads (15.5% vs. 10.3%).

Domestic water supply: about 95 % of local people in Quynh Thang commune are using domestic water from drilled/dug wells. Few are using rainwater or buying water (the ratios are respectively 4% and 1%). However, it is surveyed by the Consultant that the construction work of the project will not affect water supply or domestic water uses of local people.

Environment sanitation: domestic wastes of all hamlets are collected at the end of a day and transported to planned dumpsites. In some villages, domestic wastes are collected and treated by the household themselves. In general, the domestic waste are either buried or burnt.

In the project area, up to 66.6% of households have sanitary latrines including 32.4% having septic or semi-septic toilet and 34.2% using two-compartment toilets. Moreover, about 1/5 of households (21%) are using simple latrines (digging holes in gardens or using bridges over ponds) and 2.0% of households having no toilets.

Tourism: is the results of survey shows that Quynh Thang commune has no site planned for tourism such as relics, sight of interest so local people participating in tourism service is zero.

Fire-fighting: Quynh Thang officially committed to fire prevention and fighting regulations annually in the commune. So far, there has been no significant fire leading to serious damages of people and property.

4.3.5 *Ethnic minorities*

There is no ethnic minority household affected in the project area.

4.4 Past Incidents, their Impacts, Measures undertaken and Present Condition

4.4.1 *Past incidents and their impacts*

Up to now, no incident has occurred with Khe San reservoir. However, the high level water in reservoir due to the heavy rain after two storms No.5 and No.7 in 2005 and 2011 respectively caused the overflow through dam rest at some places. It damaged agriculture lands of farmers in the villages 4, 6, 7, 9 and 11.

4.4.2 *Measures undertaken to Repair the Dam*

The necessary supports for affected people were provided by Quynh Thang commune and Quynh Luu district. Since then, the flood prevention and control has paid attention more by the commune.

4.4.3 *Present Condition of the Dam*

The headworks of Khe San reservoir have been degraded seriously. The sedimentation of reservoir and low flood discharge capacity of spill way threaten the lives and assets of local people at downstream. Specially, the water level rise sometimes at around 50-60cm below dam crest in rainy season.

CHAPTER V. IMPACT ASSESSMENT

5.1 Results of the environmental and Social screening

5.1.1 *Environmental and social eligibility screening*

Based on the results of the Environmental and Social Screening, the sub-project is eligible for financing under DRSIP. The proposed rehabilitation works will not increase the original design storage capacity of the reservoir and therefore would not inundate additional areas. The proposed works are not located within or near any critical natural habitat. The area is not known to harbor any rare or endangered species and this was confirmed during the site survey and through interviews with the local residents. The sub-project will not affect any physical cultural property as there are no structures, monuments or sites of cultural, religious or historical significance in the sub-project construction site. The screening also places the subproject under Category B of the World Bank's classification. However, as agreed with the World Bank, an ESIA was still conducted as the sub-project is one of the first 12 subprojects identified for implementation during the first year of DRSIP. Moreover, the Khe San Dam is by definition a small dam, having height of less than 15 meters and reservoir capacity of less than 3 million cubic meters. See Appendix A4 for the completed Environmental and Social Screening Form.

5.1.2 *Ethnic minority screening*

There is no need for the preparation of Ethnic Minorities Development Plan (EMDP) as there are no indigenous population or communities of ethnic minorities in the area.

5.1.3 *Involuntary Resettlement*

A Resettlement Action Plan/Compensation Plan (RAP) has been prepared for this subproject, but, in fact when the subproject is implementing, there is no permanently land acquisition and resettlement.

5.2 Environmental and Social Impacts

Works which are proposed to be upgraded and repaired shall not make any change to the hydrology of reservoirs and the lower course of intake channels. The activity will improve the safety of focal works. The construction course occurs mostly in dry season. In addition, the flow in the receiving channel is very minimum (also sometime dry-up) and there is no important aquatic species there.

The repair and upgrading of the Khe San Dam and facilities would have adverse social and environmental impacts. In terms of environmental impacts, include: (i) potential land and soil degradation at construction sites and vicinities due to construction litters, excavations, and compaction; (ii) and land temporary acquisition: 10,000m²; (iii) temporary increase in sedimentation and turbidity of receiving water bodies, including the reservoir due to significant earthmoving activities; (iv) emission of dusts and noise due to heavy equipment and vehicular traffic; and, (v) other impacts associated with construction activities are s increase in health and safety risks at construction sites.

In terms of adverse social impacts, the significant impacts are: (iii) possible damage to existing roadways due to the mobilization of heavy equipment and hauling of embankment materials from the borrow pit to the dam site; and, (iv) disruptions in the delivery of irrigation water during construction.

5.3 Impacts during Subproject Preparation Stage

The activities during sub-project preparation include activities that have already been completed such as the feasibility study and this environmental and social assessment. Other

activities that still need to be completed are: the preparation of detailed engineering and program of work and the land and temporary acquisition and procurement. Throughout this period, residents, farmers, women and other sectors in the community may experience apprehensions about the impacts due to the sub-project. These would include loss of lands, crops and structures due to land acquisition or temporary easements for the construction activities and the likely disruptions in water supply which could lead to loss of crops for entire cropping season. Some people may also wish to be hired during construction. The people need to be consulted and provided opportunities to provide input into the design and plans of the sub-project.

Table 5.1. Environment and social impacts during sub-project preparation period

Impacts	Assessment	Description of the Impact
General apprehensions by residents, farmers, women, other sectors about the impacts of and opportunities in the sub-project, which may lead to speculations and adverse perceptions about the sub-project and to conflicts.	Low, Temporary	Some individuals or sectors within the communities may experience anxiety over rehabilitation's impacts and opportunities. They would most probably include apprehensions about loss of access to lands, loss of crops and structures due to land and easement acquisitions/recoveries by the sub-project, as well as water supply/irrigation interruptions during construction which may lead to worries and about potential losses crops or entire cropping season; access to employment opportunities in the construction activities.

5.4 Impacts during Construction Phase

The activities in the construction stage will include clearing and grubbing, equipment installation, building of construction camps, clearing and preparation of easements, hauling of materials, excavation, embankment works, concreting, and construction of operation house, access/service road, works on the canal, cleaning of reservoir, demolition, clearing and site restoration. The negative environmental impacts of these activities are mostly localized and temporary.

Table 5.2. Impacts on the environment and society the during construction period

Impacts	Assessment	Description of the Impact
Land/soil degradation	Medium, localized, medium term	Lands in the vicinity may degrade due to change in landscape, construction spoils/solid wastes (i.e. cut soils, excess materials, herbage, trees, food wastes and litters), loss of vegetation cover, and loss of, loosening or compaction of top soils, on burrow pits, campsite, temporary access and easements.
Impact on biodiversity and ecosystem	Low, localized, temporary	The few birds and other wildlife may temporarily migrate further from the site due to increased human activities. They are however expected to return once construction activities wind down.
Increased nuisance from dust and noise	Low, localized, short term	Temporary and short term increase in particulate matter and noise due to earthmoving and heavy machineries and equipment traffic, the hauling of embankment and construction materials. Minimal changes in the air quality

Impacts	Assessment	Description of the Impact
		parameters such as SO _x , NO _x , VOC, CO from emissions of machineries and equipment.
Impact on the surface water quality	Medium, temporary	There will be increased turbidity in surface waters due to increased sedimentation from earthmoving activities at construction and at quarry sites. This impact will be temporary.
Impact on the soil and groundwater quality	Low, very localized, short term	This will come from fuel and used oil spillages within the camp site and motor pool areas. The impact is expected to be very localized and minimal.
Loss/change/land use conversion	Low, localized, permanent	A total of about 1.0 hectare will be temporarily converted for use in the project.
Loss of crops, trees and livelihood source	Low	About 1.0 hectare will be temporarily used during construction.
Interruption in irrigation water supply	High, localized, short term	Interruption of about 1-2 months in some portions of the irrigation's service area is expected during construction
Occupational health and safety	High, localized, short term	Workers are exposed to short term health and safety hazard at construction sites during the operation of the machineries and equipment.
Public health and safety	High, localized short term	Residents are exposed to short term health and safety hazard due to construction activities, construction wastes and emissions, and possible new diseases due to the contacts with construction workers from other areas. During construction the dam may also be exposed to high risk of breach especially with occurrence of natural calamities.

Loss of Lands, Trees, Crops and Livelihood Source

1.0 hectare land will be temporarily used during construction (i.e. for temporary facilities, storage yard, vehicle and equipment parking area, camp, corridors and easements) and it is also owned by the Quynh Thang Commune People's Committee. .

Table 5.3. Project Impacts on Land Acquisition classified by Location

Project Location	Total AH (HH)	Temporarily affected Area (m ²)	Permanently affected Area (m ²)	Permanently affected public land (m ²)
Khe San reservoir	0	10,000	0	0
Total	0	10,000	0	0

Community Health and Safety Risk

Local residents may be exposed to health and safety hazards due to construction activities, including traffic, material transportation, falling materials and debris on road and dust generation around the transportation roads and in the borrow pit, quarry areas., construction wastes and emissions, and possible new diseases due to the influx of construction workers from other places. Residents, especially children could venture into areas of deep excavations, operating equipment, weak grounds or scaffolds. Also, during construction, workers on construction site may be exposed to high risk of breach especially during extreme weather events (dry season and foehn). Moreover, the process of demolition, site clearance, and pit excavation may reveal the toxic substance buried earlier in the project area, including unexploded ordnance.

Impacts on Biodiversity and Wildlife

As discussed earlier the area does not have significant wildlife population. The cutting trees, shrubs and clearance of vegetation will be confined within the 1.42 hectare land to be used. Therefore impacts would be very minimal. Also, the small population of birds, reptiles, rodents and insects will likely migrate to nearby vegetated areas. In general, the noise and daily commotion of construction activities will temporarily drive the animals further away from construction site but are expected to return once the construction activities wind down. In terms of aquatic life and habitat, the reservoir contains only aquaculture species which can be replenished. During the repair of the spillway and the fixing of the seepages, the reservoir is not expected to be emptied.

Impact on Surface Water Quality

Impacts on the surface water would be coming from three sources: increase of sediment from clearing and earthmoving activities; domestic wastewater from workers in camping site and on site, in the plot of washings equipment and machines. Sediments would mostly come from loose and exposed soils and embankment materials at the burrow pit sites, at dam and the cleared areas within the 2.42 hectare land. This will cause increased sedimentation and turbidity in the receiving water bodies, including the reservoir and irrigation canals, during rains. This impact would be temporary and can be easily mitigated.

The wastewater from the construction workers, assuming a peak of 30 workers on site, may not be a significant additional burden to the carrying capacities of water bodies, but analysis indicate that, the wastewater, if discharged directly into the environment will not be able to comply with the national standards for wastewater. According to National Standard TCXDVN 33:2006 on Water supply - External Networks and Facilities – Design Standard, average volume of water for domestic purpose is 100 litres/day/person. The actual working on site showed that amount of water consumed by a worker is 60 liters-Peron-day. With number of 30 workers, volume of waste generating every day is of about 1,440 litres/day (the 80% of water supply will be discharged).

Table 5.4. Waste load in domestic wastewater in construction stage
(Based on estimated 30 workers at construction site)

Parameters	Discharge indicator (g/person/day)	Load (kg/day)
BOD ₅	45 – 54	2.25 – 2.7
COD	72 – 102	3.6 – 5.1
Suspended solids	70 – 145	0.35 – 0.75
Total nitrogen	6 – 12	0.3 – 0.6
Total phosphor	0.8 – 4.0	0.04 – 0.2

Parameters	Discharge indicator (g/person/day)	Load (kg/day)
Total coliform	$10^6 - 10^8$ MPN/100ml	-

(Source: Report on the current status of urban waste water- Institute of Environmental Science and Technology – Hanoi University of Science and Technology)

The calculation above showed that the concentration of pollutants in domestic wastewater exceeds permitted standards. Without adequate method to store, collect or treat, it may overflow surface and percolate into the ground, hence contaminate soil and groundwater or cause water pollution for the receiving sources. However, the addition of 30 people may not be a significant added burden to the carrying capacities of the receiving water bodies and the reservoir with proper facilities.

Wastewater from construction activities – Wastewater from the washings of equipment will be insignificant source of pollution, except in cases of accidental spillage of fuel or oil into the stream. These will cause water pollution of receiving water body. Wastewater is also generated from the process of concrete placements. These wastes are characterized by high concentration of Suspended solids and low pH. Wastewater from washing vehicles and machine may contain high levels of oil and suspended solids. However, this will not be frequently cleaned and will not create significant amount of wastewater. In addition, this machines will not be concentrated in one place but scattered, thus, the amount of water used to wash the machines are not regular and substantial, the total volume of wastewater from cleaning the machines, equipment and construction at each construction site is about $1.08 \text{ m}^3/\text{day}$.

Impacts on Air Quality

During the construction stage, most of the activities are likely to cause air pollution; the main pollutants are from vehicles transporting materials and construction equipment.

Dust:

Dust generated by the friction between the vehicle and road surface, emissions from construction equipment. In addition, dust due to cutting of trees, shrubs and plant clearance will cause air pollution. Demolition and site clearance works (dam, management road, etc.) may also give rise to dust at small scale. Concentration of dust is expected to increase in sunny days, spreading scale can range up to 200m in days with large wind.

Dust generating from transportation of excavated soil:

As estimated, 158,576 tons of soil will be transported in this stage. The subproject will use vehicle type with an average weight of 10 tons to transport material. Number of vehicles required to transport materials are: $158,576/10=15,857$ trucks. Conventionally, every 2 unloading trucks equal to 1 loading truck. So, the total number of vehicles used to transport materials are: $15,857 + (15,857/(15,857/2)) = 23,785$ trucks. During construction time of 18 months, there will be 1,321 trucks/month. The average transport distance is 0.5km.

With the similar way, the concentration of dust in the air during the material transportation can be calculated as below:

The level of dust pollution depends on the road quality, material transport means and material loading and unloading. The concentration of dust will increase in the dry, sunny and windy days.

Calculation the load of dust during material transportation (According to Assessment of Sources of Air, Water, and Land pollution, Part one: Rapid inventory techniques in Environmental Pollution, WHO, Geneva, 1993) as following:

$$L = 1,7K \left[\frac{s}{12} \right] x \left[\frac{S}{48} \right] x \left[\frac{W}{2,7} \right]^{0,7} x \left[\frac{w}{4} \right]^{0,5} x \left[\frac{365 - p}{365} \right] (*)$$

Where:

- L : Load of dust (kg/km/truck);
- K : Particle size of material (0.2);
- s : The amount of soil on the road (30%);
- S : The average speed of vehicles(30 km/h);
- W : Loaded weight of the vehicle (8 tons);
- w : Number of wheels (10 wheels);
- P : Number of operating days in the year, P = 300 days.

From the equation (*), with the real parameters, we get L = 0.32 kg/km/truck. So, the load of dust pollution is calculated: M = 0.32 kg/km /truck x 0.5km x 23,785truck = 3805.6 kg dust corresponding to 12.68kg/day or 1.58kg/h (working hour: 8h/day) during construction process.

The total load of pollutants: E = Average generated load (kg/h)x10⁶/(average road distance) x 10³ x 3,600) (mg/m.s).

$E = 1.58 \times 10^6 / (0,5 \times 10^3 \times 3600) = 0.88 \text{ (mg/m.s)}$. To assess the impact of dust pollution, we use the Sutton computational model - determine the concentration of pollutants at any calculated point. The concentration of pollutants are calculated by the following equation:

Where:

- C: dust concentration in the air (mg/m³).
- E: load of pollutants from source(mg/m.s).
- z: the height of the calculated point: 1(m).
- h: the height of the road surface comparison with surrounding: 0.5 (m).
- u: The average speed of wind in construction area: 1.5 (m/s).
- x: coordinates of calculated point(m).
- δ_z : Just diffusion coefficient under z direction, is defined by the equation:

$$\delta_z = 0.53x^{0,73}$$

Where x is the distance under wind direction at calculated point comparison with waste source (m), the pollutant diffusion coefficient is calculated as following:

Table 5.5. Dust diffusion coefficient under z direction

(Centre for Environment and Development)

x	3	5	10	15	20	25
δ_z	1,1818	1,7160	2,8462	3,8266	4,7209	5,5561

With the values of δ_z above table, we get C - dust concentration in the air as table below:

Table 5.6. Concentration of dust in the air due to excavated soil transportation

X (m)	3	5	10	15	20	25	Vietnamese standard 05: 2013/BTNMT
C (mg/m ³)	1.503	00.779	0.406	0.291	0.232	0.196	0.3

(Calculated by the Center of Environment and Development)

According to the results of above calculations, the concentration of dust in the air exceeds the limits of 05 QCVN: 2013/BTNMT at the distance of 5 meters from the source.

Dust generated from the transportation of steel, iron and other materials:

As estimated, 102,277 tons of iron, steel and other materials will be transported during this stage. The average distance to transport materials from the supplier to the subproject is 18km. Performing the similar calculation as for dust generating from excavated soil transportation, dust concentration generating in this phase is determined as follows:

Table 5.7. Dust concentration in the air due to iron and steel transportation

X (m)	3	5	10	15	20	25	QCVN 05: 2013/BTNMT
C (mg/m ³)	0.311	0.235	0.132	0.090	0.068	0.055	0.3

(Calculated by the Center of Environment and Development)

As can be seen from the estimates above, the dust generated in the material transportation will impede the vision and affect to the health of workers and local people in the sub-project area. Dust also affects animals and plants. The dust deposited on the surface of leaves will reduce the photosynthetic capacity and affect the growth and development of plants. According to the results of above calculations, the concentration of dust in the air approximately exceeds from 1 to 1.19 the limits of 05 QCVN: 2013/BTNMT at the distance of 3-5 meters from the source. Therefore, the sub-project owner will focus sprinkling of water in this distance, in order to minimize the impacts to workers and local people in the construction area.

Vehicular Engine Exhausts - Emissions from vehicles contain gas including SO₂, CO₂, CO, NO_x, VOC, etc. This kind of air pollution depends on number of construction vehicles, machinery and methods of construction. As estimated, there are about 15 construction trucks travelling on road every day. The forecast of pollutants from vehicles using diesel as follows:

Currently in Vietnam, there are no specific standards for the level of emissions from construction vehicles. Thus, the calculation of emissions from construction vehicles is estimated based on the pollution load coefficients provided by *Pham Ngoc Dang (air environment - Basic Theory, dust pollution, toxic air pollution, thermal pollution, climate change, noise pollution, the risk of environmental hazards and handling methods to reduce the pollution, Hanoi 1997):*

Table 5.8. Emission coefficients by a vehicle in traffic load

Types of vehicle	Units(U)	TSP (kg/U)	SO ₂ (kg/U)	NO _x (kg/U)	CO (kg/U)	VOC (kg/U)
- Small truck, diesel engine <3,5 tons	1000km	0.2	1,16S	0.7	1	0.15
	Ton of oil	3.5	20S	12	18	2.6
- Big truck, diesel engine 3,5 – 16 tons	1000km	4.3	20S	55	28	2.6
	Ton of oil	1.6	7,26S	18.2	7.3	5.8
- Very big truck, diesel engine > 16 tons	1000km	1.4	6,6S	16.5	6.6	5.3
	Ton of oil	4.3	20S	50	20	16

(Source: calculated following emitted gas emission factors by Professor, PhD of Science Mr. Pham Ngoc Dang, *The air environment – The basic theory, dust pollution, hazardous gas emission, Hanoi 1997*)

The total truck turns used to material transport are: 15,857 trucks, with an average length of the distance of 18 km for transport from the original source to the construction area. The number of km of transportation can be calculated: 15,857 trucks x 18 Km = 397,468 Km. The number of litres of diesel oil can be calculated: 397,468kmx0.2liter/km = 79,493 liters.

According to the conversion of diesel oil (0.5% S) from litres to kg is: 1 litre of diesel oil = 0.85kg diesel oil, then, we can get the number of kg of diesel oil: 79,493 liters x 0.85kg = 67,569 kg ≈ 67.6 tons of diesel oil.

The total construction period is expected to be 18 months 450days). Based on emission coefficient at table 5.8, the emissions generated from the material transportation to adapt the construction process can be calculated as follows:

Table 5.9. Calculation sheet on prediction of gas emission generating from transportation

Type of gas	Emission (kg/Ton diesel oil)	Emission amount (Kg)	Generating amount (kg/day)
TSP	1.6	144.21	0.52
SO ₂	7.26	654.13	2.38
NO _x	18.2	1639.82	5.96
CO	7.3	657.73	2.39
VOC	5.8	522.58	1.90

Formula for calculating the average concentration of emissions:

$$\text{Average concentration (mg/m}^3\text{)} = \text{Load (kg/day)} \times 10^6 / 8 / V(\text{m}^3).$$

Working hour: 8h: Area of affected region is distance of transport road and construction site:

Area of transport road: $S_1 = d \times R$. Where: $d = 25\text{km}$ (average length of the distance to transport soil, sand, rock and other materials), $R = 10\text{ m}$ (average width of road base): $S_1 = 25,000\text{m} \times 10\text{m} = 250,000\text{m}^2$.

Area of construction site: $S_2 = 120,000\text{m}^2$.

Total area of affected region: $\sum S = S_1 + S_2 = 180,000 + 120,000 = 300,000\text{ (m}^2\text{)}$.

$\sum S = 300,000\text{m}^2$, $H = 10\text{m}$ (average height of spread of meteorological parameters within 10m).

$$V = S \times H = 3000,000\text{m}^2 \times 10\text{m} = 3,000,000(\text{m}^3)$$

Table 5.10. Concentration of gas estimated to be generated during transportation

Pollutants	Gas concentration (*) (mg/m³)	QCVN 05:2013/BTNMT 1 hour average (mg/m³)
TSP	0.1	0.3
SO ₂	0.254	0.35
NO _x	0.139	0.2
CO	0.457	30
VOC	0.363	-

Note (*): average concentration = load x10⁶/(8xV).

From estimated concentration in above table and in comparison with national technical standard 05:2013/BTNMT, the concentration of TSP, CO, SO₂ and NO_x generated are within allowed limitation.

Noise - Noise is generated mainly from excavation and earth filling activities by equipment, transport vehicles, etc. It can affect workers in the working areas harmfully and cause discomfort for people who live in neighbouring regions. Being exposed to high level of noise for a long time will lead to decrease of audibility, fatigue, stress, insomnia as well as reducing labor productivity; if people bear too noisy level continuously for 8 hours and last for many years, they may be affected as blood pressure increase, nervous system disruption and with occupational deafness disease, etc. According to national technical standard QCVN 26:2010/BTNMT, allowed noise in public and residential area is 55 – 70dBA (from 6am to 9pm).

Table 5.11. Noise from transporting means and construction machines

No	Types of machines	Noise corresponding to the distance of 1 meter	
		Range	average
1	Trucks	82-94	88
2	Concrete mixing machine	75-88	81.5
3	Soil digging machine	75-98	86.5
4	Excavator	75-86	80.5
5	Rammer	75-90	82,5

QCVN 26: 2010/BTNMT: 70 dBA (6-21h); 55 dBA (21-6h)

(Source: Phạm Ngọc Đăng, Air environment, Publishing house of Science and Techniques, Hanoi – 1997)

The impacts of noise on the human body in different frequency bands are shown in Table 5.12 particularly.

Table 5.12. Impacts of noise with high intensity to the human health

Ranges (dBA)	Impacts to listener
0	Hearing threshold

100	Start to change the heartbeats
110	Excite eardrum strongly
120	Strident
130 - 135	Causing mental disease, retch, weakening touch, and muscles
140	Causing hurt and strident, losing mind and mad
145	The maximum limit human can bear the noise
150	If we listen to the noise at this range for a long time, eardrum shall be broken
160	It's dangerous for us to listen to the noise at this range for a long time
190	Listening in a short time can cause danger

The sub-project area is located in the mountainous valley and far away from residential areas, so noise only temporary impacts the workers within the sub-project construction site. The influence of noise to the surrounding residential area will be negligible.

Land and Soil Degradation

During the construction, the amount of solid waste generated are rock, lime waste, packaging materials, garbage workers working in the field .etc. For these resources if they are discarded directly instead of collected and processed completely that will be a source of environmental pollution and will cause loss of landscape. A part from domestic sewage, rainwater containing sand, sludge, grease and wastewater from construction seeped into the area will affect to soil quality (hardened soil and reduction of the amount of soil organisms). According to the technical design report, the volumes of excavated soil are about 102.056m³.

Change of soil environment can depend on the direction change of terrain, physical and chemical property changes. The layer of plant is altered by motor vehicles, levelling and bulldozing machinery for ground and road. The construction will create grooves on the ground, and erosion if the drainage measures are not considered carefully. The excavation activities will take top soil layers, loss of vegetation and local fauna. These disturbances can lead to changes in the proportion of soil, reducing moisture and natural drainage capabilities.

Solid waste generated during construction - The dumping of waste materials can cause temporary or permanent loss of land.. If the waste and materials area are stored for extensive periods, it can cause unhygienic environmentsoil and water environment can be polluted by rainwater flowing through the waste dumped area, affecting people, indirectly.

Solid waste – Approximately 30 workers will be engaged at the construction site . The impact of domestic waste of workers on environment will be similar at each construction site. On average, a worker will generate a waste of about 0.3 - 0.5 kg per day. Consequently, the amount of waste discharged by 30 people during this period is of about 9-15 kg per day, in which the organic matters accounts for 60-70%, other components including paper, plastic, packaging etc. are about 30 – 40%.

Construction can generate hazardous waste such as fluorescent light bulbs, batteries, mops involving oil, waste oil .etc. Uncontrolled disposal of these wastes could cause land/soil degradation within the construction site vicinities (i.e. landscape becoming unsafe, elevated concentration of heavy metals, death of microorganisms affecting yield of plant, etc.).

Impacts on agricultural production

At the construction stage, the headworks construction will not affect negatively on agricultural production in local area, because the old intake water can still be used to take water for irrigation

until the new one completed. A border dyke will be developed for new intake water construction. The headworks such as dam, intake water will be constructed in the period of changing season. This time is changing season from Winter-Spring to Summer-Autumn, the water requirements for agriculture production is low. Some headworks construction requires reducing water level to the death level. At this level it is still possible to pump water directly into the irrigation canal.

Impacts on Existing Roadway - During the construction stage, the large trucks will be used for material transportation. The large trucks moving on the local roads will cause damage or deteriorate the local roads.

5.5 Impacts during Operation Stage

The activities during the operations stage include daily operations and periodic maintenance of the dam facilities, including the management house, the access road and the intake valve and the spillway. The long term benefits of the sub-projects would be realized during this stage. Table 5.13 below summarizes both the positive and negative impacts of the completed and operational sub-project.

Table 5.13. Impacts during operation stage

Impacts	Assessment	Description of Impact
Increased reliability of irrigation water	High, Direct, Long term	The repair and upgrading of the dam and the installation of improve operation and maintenance program for the reservoir will result in increased reliability of irrigation water in the service area, which means more stable irrigation water to 104 hectares of rice paddies. There will also be reduced occurrence of water shortage during dry season.
Improved safety of downstream communities and increased security of farms, properties and infrastructure downstream	High, Direct, Long term	The repair and reinforcement of the dam, spillway and the replacement of the water intake as well as the adoption of a better operation/management system that takes into consideration dam safety will certainly redound to: (1) reduced probability of dam breach; (2) enhanced flood control function of the dam; (3) increased resilience of the reservoir against extreme weather events and earthquakes; and, (4) Improved perception of safety among the downstream residents.
Improved socio-economic conditions in the sub-project areas and the region	High, Indirect, Long term	The increased reliability of irrigation water supply is expected to improve farm productivity and hence farmers income in the service area. This, together with favorable perception of dam safety is expected to encourage investment on the downstream farms and properties as well as around the dam area, particularly along the road to Nghia Dan, contributing to improved socio-economic conditions in the area.

Impacts	Assessment	Description of Impact
Improved access by community residents to market, school and other social services	High, Direct, Long term	<p>The upgrading of the dam of Khe San reservoir will increase the ability to access to social services, transport of local people because the dam is the main road connection of the commune.</p> <p>Beside that the upgrading of road will also help people surrounding Khe San reservoir as they can travel more easily and create favorable conditions for economic and social development and cultural and economic exchange with neighboring regions.</p> <p>The easy travel can also help people as it can save time, reduce transport cost and increase business chances of agricultural products between communes. The women will have more time for other production or have more time for taking care of their babies.</p>
Increasing awareness of local people and local authorities in the management of disaster risk and dam's safety	High, Direct, Long-term	The dam's upgrading and communications activities of local authorities and Project Management Board will increase awareness of local people and local authorities in the safety of dam and reservoir via stakeholder's consultation activities, meeting and participation in construction activities.
Solid waste, wastewater arising at the operation house during the reservoir regulation.	Negligible, Direct, Long-term	The volume of garbage, night soil and wastewater to be generated from the new Management House would be insignificant given the size of the facility (i.e. 90 sqm floor area). The building must be also provided with adequate toilets as required under the Ministry of Health's regulation.
Increased use of pesticides	Low, Indirect, Long term	Increased reliability of irrigation water in the service areas may lead to intensification of agricultural production resulting in increased used of agrochemicals including pesticides.

5.6 Significant Impacts that need to be addressed

Based on the above assessments, the following are the significant impacts and issues associated with the subproject that would need to be addressed:

- General apprehensions by residents, farmers, women, other sectors about the impacts of and opportunities in the sub-project, which may lead to speculations and adverse perceptions about the sub-project and to conflicts;
- Increase concentration of dusts during dry days near the construction sites, in burrow pit areas, and along the embankment hauling routes due to massive earthmoving activities;
- Possible land and soil degradation within the construction site and the burrow pit areas;
- Temporary migration of wildlife away from the construction site and burrow pit areas.

- Possible increase in turbidity and sedimentation of the reservoir and the water channels draining the construction sites and burrow pit areas during rainy days;
- Loss of land, trees and crops due to temporary land use by the subproject;
- Damage to existing roads due to hauling and equipment mobilization (identify the routes);
- Possible interruption in irrigation water supply during the construction of the new intake structure;
- Increase health and safety risks of workers and local residents due to exposure of construction hazards, including vehicular traffic; and
- Possible long term increase in the use of pesticides.

CHAPTER VI. ALTERNATIVE ANALYSIS

6.1 Without subproject

6.1.1 *Existing subproject facilities*

Khe San reservoir consists of a 320m long earth dam, 5.2km² of the basin area, 23.6m wide spillway, 50m long water intake and 145.8m long management road. The storage capacity of the reservoir is 1.47x10⁶m³ and irrigated area in design is 120ha but in fact, just only from 50-60ha of rice (Due to long time operation, the earth dam is seriously degraded). All these facilities are existing.

Dam: It is homogeneous earth dam with the height from 8.0-12m, crest elevation is at 46m; and width of 2.6-3.2m.



Figure 6.1 *Existing dam crest and dam face*

Spill way: It is an earth and broad-crested free spillway. The width is 23.6m



Figure 6.2 *Existing spill way*

Water intake: 50m long water intake. There is a simple valve tower without protect fence and house



Figure 6.3 *Culvert tower and downstream canal*

Management and operation road: is a narrow road with about 1-1.5m wide. It is steep slope and slip in rainy season, difficult to travel.

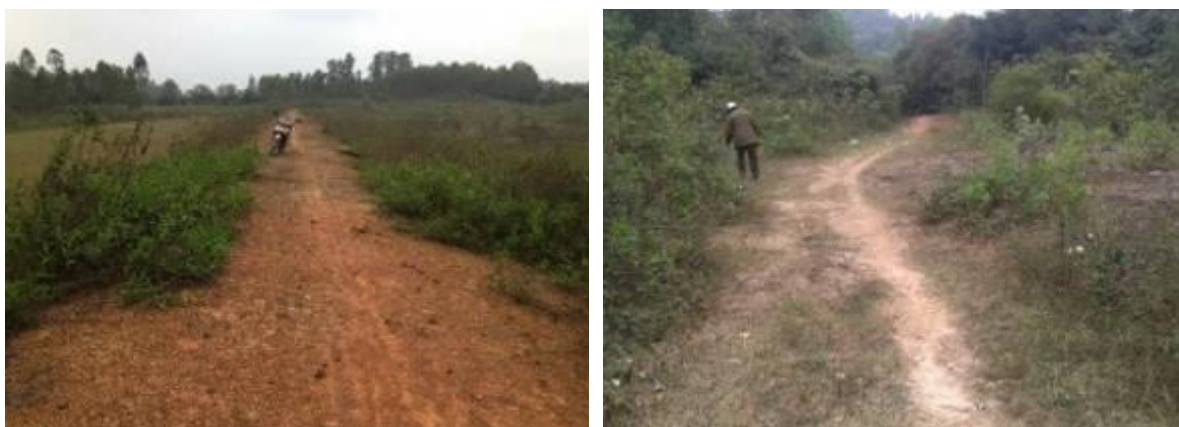


Figure 6.4 *The existing management road*

6.1.2 *Dam and Reservoir Safety Characteristics*

Khe San reservoir was built in 1980. Due to long time operation, the earth dam is now seriously degraded with the small dam crest, low and roughness dam. The previously filled soil of dam has low quality, and untreated ant leakage, therefore infiltration occurred some points in body and foundation of dam. Upstream face is protected by rubble with peeling, damaged in some areas. Transplant grass at downstream face is eroded in many places and no drainage equipment. On the other hand, spillway is earth spillway located in right shoulder of earth dam. Spillway is damaged, eroded, specially the contiguous dam shoulder and downstream spillway.

According to the former design, the flood frequency prevention is $P = 2\%$. Due to the impacts of climate change, the heavy rain and flood have occurred more often, flooding faster causes of deforestation. Based on National technical standard QCVN04-05-2012/BNNPTNT, the safety design for flood prevention is $P = 1.5\%$, so the risk of dam failure is high if heavy and intensive rainfall. At the downstream of Khe San dam, local people had settled to live and stable produce (include 1,800 people and 650 ha of natural land).

6.1.3 *Existing reservoir operation*

Khe San reservoir is currently managed and operated by Quynh Thang agriculture cooperative, Quynh Thang commune. This is a self-experience-operation reservoir.

It has not met the safety dam standards in operation and exploitation of Khe San reservoir such as: not enough staff of reservoir management, untrained management staffs, no operation

regulation, no flood control and prevention plan and no Emergency Preparedness Plan (EPP). And there is also no environment and social measures applied for the reservoir since construction.

6.2 With Subproject

The dam can not be operated in same condition for long time and immediate rehabilitation and safety improvement is necessary from both operation and environmental perspective. After reservoir facilities repaired and upgraded, it will be transfer to Bac Nghe An Irrigation Management Company for operation and management to ensure complying with current management regulations of big reservoir. The following measures to improve reservoir safety operation applied:

- Install lighting facilities and witness mark for dam monitoring;
- Build the protective fence to prevent buffalo and cow grazing in the dam face;
- Install monitoring equipments of dam body such as filtration and displacement equipments and water level equipments at spillway and water intake and gauging equipment;
- Formulate and approval operational regulation;
- Develop Emergency Preparedness Plan; and
- Apply environment and social measures in construction and operation of reservoir.

CHAPTER VII. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

7.1 ESMP Objectives

The basic objective of the ESMP is to manage adverse impacts of project interventions in a way that minimizes the adverse impact on the environment and people of the Project influence area. The specific objectives of the ESMP are to:

- Facilitate the implementation of the mitigation measures identified during ESIA;
- Maximize potential project benefits and control negative impacts;
- Draw responsibilities for project owners, contractors, consultants, and other members of the Project team for the environmental and social management of the Project;
- Share information about the scope of the project, its impact and mitigation measures;
- Encourage of the participation in the community for managing the impacts of the sub-projects;
- Define a monitoring mechanism and identify monitoring parameters in order to:
- Ensure the complete implementation of all mitigation measures,
- Ensure the effectiveness of the mitigation measures;
- Maintain essential ecological process, preserving biodiversity and where possible restoring degraded natural resources; and
- Assess environmental training requirements for different stakeholders at various levels.

The ESMP will be managed through a number of tasks and activities and site specific management plans.

7.2 Mitigation Options

Given the small scope of dam repair, and the currently proposed measures (in the ESIA) that aims to avoid water cut, the potential adverse impact (due to lack of water) on farming activities could be avoided, or minimized. In addition, as part of mitigation measures, dam repair activities would be done during dry season when the cropping area are minimal, and when the type of crops grown by farmers does not rely on large quantity of water to sustain the crops. The RAP which was already prepared for this subproject will be updated to reflect the nature and scope of impact, consultation outcomes, and relevant compensation and support packages to ensure the affected people are not worsened off, in economic term, as a result of the subproject implementation.

7.2.1 Mitigation measures during preparation stage

Table 7.1. Mitigation measures during preparation stage

Impact	Source Activity	Mitigation Options	Evaluation of Options
General apprehensions by residents, farmers, women, other sectors about the impacts of and	Feasibility study preparation ESIA	Conduct information drive and consultations with local communities.	Consultation the local communities during the conduct of the EIA/ESIA is required under the World Bank's OP/BP 4.01 as well as under Vietnam's LEP. The LEP requires public consultations at two stages: during the EIA preparation and during the review of the EIA report.

Impact	Source Activity	Mitigation Options	Evaluation of Options
opportunities in the sub-project, which may lead to speculations and adverse perceptions about the sub-project and to conflicts.	Detailed Engineering and Program of Work	<p>Prepare and implement a Communication Plan</p> <p>Prepare and implement a Gender Development Plan</p>	<p>If farmers are not informed or consulted about the timing and strategy of construction, there may be heightened apprehensions about potential crop losses and some farmers may develop negative attitude about the sub-project. If consulted, farmers can help determine the best timing of the construction activities. This will also allow them to plan ahead.</p> <p>On the other hand other sectors in the community such as women may have different needs or use of the facilities such as the use of reservoir water for washing of clothes and other chores that could be improved by certain design enhancements.</p>
	Land, road right-of-way and/or easement acquisition	Preparation of RAP according the World Bank OP/BP 4.12.	This is mandated under World Bank policy. The policy provides for consultation with affected persons, fair and just compensation, and resettlement in case of displacement of homes or livelihood. A Resettlement Action Plan/Compensation Plan has been prepared.
	Procurement and Bidding.	Prepare and implement a Communication Plan.	Periodic updates and open communication on the progress of the sub-project preparation will increase the people's ownership of the sub-project and will eliminate any speculations and apprehensions.

The specific measures to mitigate potential impacts during land compensation and clearance will be presented in table 7.2.

Table 7.2. The detailed mitigation measures during land compensation and clearance

No	Potential impacts	Mitigation measures	Effectiveness Advantages/disadvantages
	The impact on households whose losing their land including residential and agricultural land	<p>Implement the mitigation measures as outlined in the Resettlement Plan. The clearance and resettlement is the responsibility of the District Compensation Committee for the compensation, support and resettlement.</p> <p><i>a. Compensation Procedures</i></p> <p>The compensation for damages must be adequately carried out in order to get smoothly clearance procedures in accordance with the provisions of the State.</p> <p>The main activities of compensation:</p> <ul style="list-style-type: none"> - Compensation for perennial crops land of households that revoked by Commune People's Committee (CPC) and compensation for trees and crops on their land. 	<ul style="list-style-type: none"> - It is inevitable that land loss affects negatively to the lives of people. - In the current situation, the difference in compensation rates between frame rates of the State and the actual rates, and the inflation impedes the compensation work. - - However, the compensation and policy support make the lives of the landless households somewhat stable. - These measures have the highly feasible. The

No	Potential impacts	Mitigation measures	Effectiveness Advantages/disadvantages
		<ul style="list-style-type: none"> - Compensation in money under replacement value calculated based on the specific land price frame in the current recovery Decisions. - The compensation for damages are performed democratically, publicly prescribed by law. <p><i>b. Clearance Procedures</i></p> <ul style="list-style-type: none"> - Early notice to the local government as well as the people affected by the project before implementing clearance procedures . - Determining exactly route direction of travel as well as works and assets that will be moved according to the designby using measures such as measuring machine, marking ... - Avoiding conflicts with local people during the clearance process by close and serious monitoring the units and hired individuals of project owner, local government and people. - Defining clearly the boundary of clearancearea. - Install the signs and inform the restricted time and transport routes. - Do not transport the waste during 2 periods: 7am to 8am and 5pm to 6pm that easily cause traffic congestion. - Moving quickly all waste to waste dump within the day. - Cover the trucks that collect and transport waste to waste dump with canvas during the transport process, do not overcharge and ensure that no waste drop along transport routes. 	<p>commitment of the project ownershould be needed under close and serious monitoring by community and other stakeholders.</p>
	<p>Impact on environment from cutting trees, shrubs and plant clearance in construction area.</p>	<p><i>a. Measures to minimize the soil environment impacts</i></p> <ul style="list-style-type: none"> - While removal of construction works, cutting trees, shrubs and plant clearance in order to prepare the land clearancefor construction, we will classify wastes. The wastes that can be recycled or used for other purposes will be collected. The solid waste that must be treated will be collected and moved to the waste dump by construction units. - Particularly for the biodegradable waste from the cutting trees, shrubs and plant clearancewill be collected to the waste dump or reused by local people. <p><i>b. Measures to minimize the water environment impacts</i></p> <p>The water environment impacts in this stage are mainly due to rainfall runoff washout the</p>	<ul style="list-style-type: none"> - These measures are highly effective, feasible and easy to implement. It needs the participation in the form of a contract between the contractor and the functional units for collection, disposal, and treat regular waste as well as oil waste. - It should have the consistency between the construction contractors. - There should be a strict sanctions and the closely monitoring. - These measures have the highly feasible. The

No	Potential impacts	Mitigation measures	Effectiveness Advantages/disadvantages
		<p>residues from demolishing fences and other infrastructures. The best measures to minimize impacts to the water environment this stage is to dredge the drains on the routes and collect cleanly garbages in order to avoid the decomposition of organic garbages causes water environment pollution.</p> <p><i>c. Measures to minimize the air environment impacts</i></p> <p>Cover the trucks that collect and transport waste to waste dump with canvas during the transport process. Sprinkle the water overall face of construction and mixing materials areas with 3 times/day for the routes through the 1 and 4A villages.</p> <p>Do not burn the waste after the demolition in the project area. Do not discharge the waste into the canal, rivers and lakes within and outside the project area.</p> <p><i>d. Measures to minimize the biodiversity impacts</i></p> <p>For the routes that have many trees, especially the useful trees for against the erosion such as turfing, shrubs and bamboos, it should be cut only trees inside the construction area in order to minimize amount of cutting trees to conserve the biodiversity.</p> <p><i>e. Measures to minimize the local infrastructure impacts</i></p> <p>The construction routes are available. Therefore, the project does not require the construction of temporary roads. However, it should be noted to the current situation of the available routes (the road has deteriorated, the weak bridges, the roads through residential areas, etc) to select the appropriate routes. In agreement with the contractors should include the commitments to restore the available routes in the case of causing the damage and deterioration.</p>	commitment of the project owners should be needed under the closely and seriously monitoring by community and other stakeholders.

7.2.2 Mitigation measures during construction stage

Table 7.3. Mitigation measures during construction stage

Impacts	Source Activity	Mitigation Options	Evaluation of Options
Land/soil degradation	Construction spoils and waste materials	Compel the contractor to adopt good housekeeping at the construction site;	Degradation of land/soil within and around construction site usually results from improper disposal of construction spoils and wastes. Lands construction sites could be deformed by boulders of gravel, soils, excavations and

Impacts	Source Activity	Mitigation Options	Evaluation of Options
	Quarrying operation Campsite and stockyard operation	Dispose of construction spoils (i.e. excess embankment materials) in the designated landfill. Restore any deformed lands before demobilization	construction wastes and would need substantive clearing in order to restore them. Usually implementation of good housekeeping practice (proper sorting, orderly storage and retrieval of materials, cleaning and waste disposal system) at construction sites is sufficient. This not only minimizes land/soil degradation but also improves efficiency and safety. The contract with contractors should include provisions for site restoration.
Impact on biodiversity and ecosystem	temporary use (1 ha) Construction activities: visual and noise nuisance	Avoidance of activities and excessive lighting at night Restoration/revegetation of temporary easement and unused land	Wildlife will likely migrate farther away the busy areas of the sites and return when the construction activities wind down. Impact on biodiversity if any would be negligible. Banning of construction activities at night may help minimize disturbance for nocturnal birds, bats and insects but allowing night-time activities may also shorten the construction period. The restoration of unused opened up after construction areas may also facilitate return of wildlife. However, as noted in the baseline study there are not much wildlife in the area and measures such as restoration may not be commensurate or cost effective measure.
Impact on air quality	Air emissions (SO _x , NO _x , CO _x) from equipment and machineries Dusts generated from earthworks and traffic	Regular spraying of roads with water during dry days Ensure only equipment with properly maintained engines are used.	Under normal conditions, air quality changes from emissions of construction equipment and machineries should be negligible. Emissions from improperly maintained engines could become a nuisance. Dust could easily become a significant nuisance and hazard during long dry periods. Spraying the sites with water is an effective measure against dusts. Community leaders should be able to prompt contractors to address dust, noise or emission nuisance when needed.
Increase noise nuisance	Operations of construction equipment and machinery	Avoidance of construction activities at night Hammering, grinding and blasting to be done only during daytime	Noise could become a nuisance and disrupt community activities. Banning of certain activities such as hammering, grinding and blasting could be imposed during periods of rests and relaxation of residents. However, a more effective measure would be to enable/allow community leaders to call the attention of the contractor when noise becomes a nuisance.

Impacts	Source Activity	Mitigation Options	Evaluation of Options
Impact on the surface water quality	Sediments from quarry and earthmoving activities	<p>Excess embankment materials to be disposed of in the designated landfill which is situated on a naturally depressed area</p> <p>Provision of silt traps around stockpiles of embankment materials</p> <p>Immediate stabilization and/or compaction of exposed/loose soils</p>	<p>All these measures are feasible. The designated landfills have been identified. If temporary stockpiles of the dirt and loose materials are necessary, care must be taken to locate these away from strong runoff. A canal around the stockpile may be provided to serve as silt trap.</p> <p>Loose bare soils on slopes should be immediately stabilized by compaction or by re-vegetation.</p>
Impact on the soil and groundwater quality	Fuel and waste oil spillage	<p>Contractor to implement good housekeeping policy at the sites</p> <p>Contractors fuel storage tank to be placed on a concrete platform and provided with perimeter oil traps</p> <p>Fuel and used oils to be contained in barrels and stored in designated area</p>	These measures are standard practice in construction site management.
Loss of land/land use rights, tree crops	<p>Acquisition of 0.5 hectare of land for the construction of Management House</p> <p>Acquisition of 1.0 ha temporary easements during construction</p>	Implementation of the RAP/Compensation Plan	This is required under the World Bank OP/BP 4.12.
Damage to existing road routes	Hauling of construction embankment and materials	Contractor's contract to include regular repair maintenance of construction road routes during construction period. Temporary	The contract with contractors should include the commitments to undertake repair and maintenance of the routes. Against the alternative of the local commune undertaking the regular maintenance, this option is the more

Impacts	Source Activity	Mitigation Options	Evaluation of Options
		detours may be established to avoid weak bridges.	effective and efficient as the contractor will have the incentive to take care of the road routes.
Interruption in irrigation water supply	Repair of the dam embankment and intake	<p>Implement a staggered or modular construction strategy</p> <p>Consultation with farmers on the timing and construction strategy to minimize cropping disruption</p> <p>Provide alternative source of water during construction</p>	<p>In the preparation of the detailed engineering and program of work, the minimal disruption of irrigation water should be priority consideration. Construction activities can be divided into modules and carefully sequenced for minimal disruption of irrigation water delivery. The timing of the disruption should also coincide with the period of less water demand from croplands.</p> <p>The provision of alternative water source should also be explored.</p>
Occupational health and safety	Construction activities; operations of heavy equipment	<p>Compel contractor to practice good housekeeping</p> <p>Installation of proper warning signs and notices</p> <p>Require wearing of PPE for workers and visitors</p> <p>Installation of water and sanitation facilities at campsite</p> <p>Proper collection and disposal of garbage</p> <p>Domestic/kitchen waste to be discharged into a soak pit</p>	<p>The contractor should have a designated environment and safety officer who has adequate authority. This officer could be the project engineer himself. His job is to ensure that standard personal protective equipment should be provided and worn by workers and proper warning signs and barriers will be installed where they are needed.</p> <p>In terms of domestic wastes (i.e. daily garbage and kitchen wastewater) generated, the construction will generate very little (about 20 workers). These wastes can be handled by the existing waste collection and disposal system in the village. The kitchen wastewater can be easily disposed of through a simple soak pit.</p>
Increased public health and safety risk due to hazards at construction sites, traffic accidents and opening of areas	<p>Construction activities</p> <p>Contact with migrant workers</p>	<p>Installation of warning signs and notices of off limits.</p> <p>Fencing off of dangerous areas</p>	On-going constructions of structures, excavations and traffic of heavy equipment pose hazards to the local residents who may pass by or venture into the area. These areas can be identified by the Contractor and provided adequate warning signs or fenced off from residents. The

Impacts	Source Activity	Mitigation Options	Evaluation of Options
not previously access by people.		<p>Provision of sanitation facilities including toilets at the site</p> <p>Medical screening of workers</p>	possibility of encountering unexploded ordinance or land mines from the previous war is unlikely in the area but a standard procedure is available and can be implemented in case of chance encounter. Medical screening of workers for infectious disease can be required of the contractor. Proper sanitation should be implemented within the construction site.

The specific measures to mitigate potential impacts during construction will be presented in table 7.4.

Table 7.4. The specific mitigation measures during construction

No	Potential impacts	Mitigation measures	Effectiveness Advantages/disadvantages
1	Rocks and dropping material deposits the Khe San reservoir, channels, and rice fields during clearance, soil excavation and material transport.	<p>+ Avoid clearance activities in the rainy season, clean up the completed work before moving on to a new line.</p> <p>+ Install the sewer grates in the drainage ditch;</p> <p>+ Dredge canals in the rainy season(if necessary) if the canals have a lot of sedimentation.</p> <p>+Clean and dredge soil, sand and rubble that spill down to paddy fields, canals from the vehicle being dumped.</p>	<p>- Highly effective, without technology or complex technical, and easy to implement.</p> <p>- These mitigation measures will depend on the progress of implementation of the project, experience and responsibilities of the construction unit. Therefore, the commitment of the construction unit will be needed.</p>
2	Soil pollution from spilling and leaking oil and other chemicals.	<p>+ Chemicals (oil, additive chemicals, etc.) for construction should be contained in containers, boxes that suit for each type of chemical and store in a safe area, with concrete floors and water resistant roof;</p> <p>+ Vehicles and construction equipment should be maintained in a good condition.</p> <p>+ Unused chemical and petroleum should be wrapped carefully before transporting to the qualified store. The box contains chemical waste that can not reuse should be separately collected and transported to specialized units to handle.</p>	<p>- The mitigation measures are simple, easy to implement, and do not need the complex technology and technique. However, the contractor must prepare the warehouse and yard before starting construction.</p> <p>- It should be coordinated between the specialized units to ensure that the waste is being handled.</p> <p>- These measures will bring good results if the construction contractors and workers are aware and educate about environmental protection, and they are tested by the project owner and other stakeholders.</p>

No	Potential impacts	Mitigation measures	Effectiveness Advantages/disadvantages
3	Water and aquatic environmental pollution from waste, chemicals, effluent or contaminated lands.	<ul style="list-style-type: none"> + Oil should be stored in a safe area, with concrete floors and roof that avoid rainwater and floodwater; + Vehicles and construction equipment should be maintained in a good condition. + Camp for workers require to have 2 toilets by the standards of the Ministry of Health. + Soil spillage should be collected and processed regularly to prevent clogging in canals and water resources in the region. + No chemical preparation close to the water source areas + Do not wash tanks, boxes containing materials. + Do not leave waste in the ranges of 10m in the water sources. 	<ul style="list-style-type: none"> - The mitigation measures are simple, easy to implement, no complex technology and technique, without raising machines. - However, the contractors must prepare the warehouse and yard before starting construction. - It should be coordinated between the specialized units to ensure that the waste is being handled. These measures will bring good results if the construction contractors and workers are aware and educate about environmental protection, and they are tested by the project owner and other stakeholders.
4	Irrigation channels and reservoirs construction interrupt supplying water for downstream and rice fields.	<ul style="list-style-type: none"> + Most of the activities that upgrading the system should be carried in the dry season. + Accelerate repairing system in the construction phase. + Technical measures such as temporary water channels should be created. 	<ul style="list-style-type: none"> - Highly effective, without complex technology or technique, and low budget. - The mitigation measures will depend on the progress of the project, experience, and responsibilities of the construction units. Therefore, the commitment of the construction units should be needed.
5	Dam safety risk	<ul style="list-style-type: none"> + Most of the activities that upgrading the dam, drain water should be carried in the dry season. + Speed up the construction. 	<ul style="list-style-type: none"> - Highly effective, without complex technology or technique, and low budget. - The mitigation measures will depend on the progress of the project, experience, and responsibilities of the construction units. Therefore the commitment of the construction units should be needed.
6	Air pollution due to dust or other emissions (CO, NOx, SOx, etc)	<p>Carry measures to minimize dust and air pollution, as follows:</p> <ul style="list-style-type: none"> + Cover the trucks that transport constructive materials with canvas during the transport process. 	<ul style="list-style-type: none"> - These mitigation measures are feasible, simple, easy to implement, and consistent with the ability of the contractor. It will be effective under close and serious monitoring. - However, these impacts can only minimize, not being able to completely overcome.

No	Potential impacts	Mitigation measures	Effectiveness Advantages/disadvantages
		<ul style="list-style-type: none"> + Vehicles and construction equipment should be maintained in a good condition. + During the dry season, the trucks should be sprayed water when they pass through the crowded residential areas, schools in the rush hour. + Regulate the limited speed (15kph) and guide the driver to know and comply with it. + The contractor will perform the proposed construction plans, approved by the PMU to minimize the time for clearance and construction, and temporary material storage. 	
7	The noise generate from construction equipment.	<ul style="list-style-type: none"> + The motor vehicles, construction equipment must be maintained periodically. + Avoid performing construction activities near residential areas in the lunch hour, or after 8 pm. + Inform the construction plans regularly to communities and local government by phone, speakerphone, text, or on the notice board of the Quynh Thang Commune people's committee. 	<ul style="list-style-type: none"> - These mitigation measures are simple, easy to implement, do not need the technology or complex technical, suitability to building contractors. It will be effective under close and serious monitoring. - However, noise impacts can only mitigate, not being able to completely overcome.
8	Obstruct traffic, increase risk of traffic accidents and reduce the ability to access to social services (schools, markets, health centers.) in the subproject area.	<ul style="list-style-type: none"> + Install the signs and lights in the construction area to guide traffic; + Create a temporary way for people to travel when necessary; + Do not set the material before the passage of local people and other busy spots + Notice the construction plan for the community. 	<ul style="list-style-type: none"> - These mitigation measures are simple, easy to implement, and do not need the complex technology and technique. - However, there must be a commitment by construction contract between building contractors and project management unit. - The risk of accidents can be entirely prevent. However obstructing traffic and reducing the ability to access to social services can only mitigate, not being able to completely overcome.
9	Materials waste arising from the construction activities on site and from	<ul style="list-style-type: none"> + Cleaning and carrying the waste from the construction to the dump regularly. + Put the trash in the proper position in the field and worker's 	<ul style="list-style-type: none"> - These measures are highly effective, feasible and easy to implement. It needs the participation in the form of a contract between the contractor and the functional units for collection, disposal,

No	Potential impacts	Mitigation measures	Effectiveness Advantages/disadvantages
	activities of workers	<p>camps.</p> <p>+ With the hazardous waste (e.g. sludge, grease and other related products from surplus oil, if any), install the collective system, temporary store around the site, contacting with the specialized unit to handle.</p>	<p>and treat regular waste as well as oil waste.</p> <p>- It should have the consistency between the construction contractors. There should be a strict sanctions and the closely monitored.</p>
10	Constructive workers temporary stay in the locality may cause social problems, affecting the lives of people	<p>+ Consult local authorities about rent house for workers instead of setting up camp. It has more advantages in solid waste management.</p> <p>+ Orientate workers how to communicate with the community, guiding them about protecting their health, sanitation, prevention of infectious diseases.</p> <p>+ Orientate workers how to prevent infectious diseases such as HIV / AIDS, other social evils such as gambling, whoredom, theft, ..</p> <p>+ Workers should be strictly banned to exploit the local resources.</p>	<p>- These measures are workable, consistent with the ability of the contractor.</p> <p>- However, the effect also depends on the consciousness of the workers and the responsibility of the construction unit.</p> <p>- Communities should be monitored and detected the violations to fine.</p> <p>- The construction units and related parties should have an agreement.</p>
11	The threats to the worker's health and labor safety in the project area.	<p><i>Safety measures in the construction area:</i></p> <p>+ Safe staff should be arranged to implement safety measures at construction sites. Safe staff should be trained in emergency first aid.</p> <p>+ Provide adequate equipment and personal safety for employees (such as helmets, gloves, belt, etc.) and training them to use;</p> <p>+ Install safety regulation table in the field.</p> <p>+ Install fencing around the construction.</p> <p><i>Reduce the risk from material transport processes along the route:</i></p> <p>+ The speed should be limited along the route (management road and dam) but it should be compliant with the residential areas and intersection segments.</p>	<p>- The above measures can fully implement and they will have highly effective if they are in full compliance with the above provisions.</p> <p>- However, it depends largely on the self-consciousness and the observance of workers.</p>

No	Potential impacts	Mitigation measures	Effectiveness Advantages/disadvantages
		<ul style="list-style-type: none"> + The contractor should conduct meetings or informing with commune staff and local people regularly, informing them about the progress of construction and traffic safety, and helping residents aware of the risks to beware. + Limit material transport in the wet season and the vehicle should be avoided overloading than the standard of roads and bridges. + Damaged pavements should be repaired timely. Implement measures to reduce dust as stated; 	
12	The impacts generate from the temporary dump materials such as dust, noise, etc and impacts on water quality.	<ul style="list-style-type: none"> + Store material along the route, dam or near the construction site to avoid congestion; + Materials should be stored in a reasonable way to avoid affecting the vehicle and pedestrians passing through the construction area; + Install fences around the area where contain the material to prevent the entry of people and animals; + Reasonable compensation for the agricultural produce of the local residents that affected by putting materials as well as using cultivated land as a temporary dump material; 	<ul style="list-style-type: none"> - These measures are highly effective, feasible, easy to implement, and do not need complex technology or technique and consistent with the ability of the contractor. - However, the effect also depends on the consciousness of the workers and the responsibility of the construction unit. - Communities should be monitored and detected the violations to fine. - The construction units and related parties should have an agreement.
13	Impacts generate from exploitation activities of land mines, stone and sand such as dust, noise, safety and the soil and water pollution and others.	<p>In the land and stone mines, contractors should follow the environmental protection issues, including:</p> <ul style="list-style-type: none"> - Machines and construction equipment need regular maintenance, in accordance with quality requirement during operation. - The hazardous waste such as oil and other chemicals must be strictly managed, stored in separate areas around the constructive area, waiting the treatment from competent 	<ul style="list-style-type: none"> - These mitigation measures are simple, easy to implement, and do not need the complex technology and technique. - However, the contractor must prepare the constructive machines, warehouse, and yard before starting construction. - It should be coordinated between the specialized units to ensure that the waste is being handled. - These measures will bring good results if the construction contractors and workers are aware and educate about environmental protection, and they are

No	Potential impacts	Mitigation measures	Effectiveness Advantages/disadvantages
		<p>authorities. Workers need to be equipped with protective tools while working in the made ground.</p> <ul style="list-style-type: none"> - Mining area must have fences, the entrance gates must have protective latches in order to prevent the entry of people and animals; - During dry days, the land mine areas should be sprayed with water. - The contractor must select the material provider that has the suitable business license. 	tested by the project owner and other stakeholders.

7.2.3 Mitigation measures during operation stage

Table 7.5. Mitigation measures during operation stage

Impacts	Source Activity	Mitigation/Enhancement Options	Evaluation of Options
Increased reliability of irrigation water	Operation of fully repaired and upgraded dam and facilities	Adoption of watershed management plan	A Reservoir Management and Operations and Safety Plan will be prepared and implemented as part of the sub-project.
Improved safety of downstream communities and increased security of farms, properties and infrastructure downstream	<ul style="list-style-type: none"> -Operation of fully repaired and upgraded dam facility -Implementation dam management system that takes into consideration safety 	None	
Improved socio-economic conditions in the sub-project areas and the region	Operation of fully repaired and upgraded dam facility	None	
Improved access by community residents to market, school and other social services	Opening of the dam access road for use by the public	None	
Increasing awareness of local people and local authorities in the management of disaster risk and dam's safety	Implementation of the dam management system which incorporate dam safety plan	Conduct regular drills or information/awareness drive with the host communities	

Impacts	Source Activity	Mitigation/Enhancement Options	Evaluation of Options
Increased use of pesticides	Intensification of agricultural production in the irrigation service areas	Introduction and/or support by MARD of an Integrated Pest Management program within the area.	
Drowning/accident hazards at the dam	Opening of the dam site and facilities to the public	Provision and maintenance of adequate warning signs, fences and guard rails.	
	Use of the reservoir and canals for recreation by local residents/children	Provide a designated recreational area and organize residents to provide regular watchers or lifeguards.	

7.2.4 *Recommended enhancements of benefits and positive impacts*

1. Minimize the impact of Natural disaster

- The safety of Khe San dam and reservoir should be checked and inspected periodically by the manager and related agencies.
- The manager should coordinate closely with Quynh Thang COMMUNE PEOPLE'S COMMITTEES (CPCs) and the local people to promptly report the risks related to the dam safety for timely handle measures.
- At the time that the safety might be prone to insecurity as the rainy season, the reservoir should be monitored regularly to ensure the reasonable water regulation.
- For the flood discharge problem, the flood inundation mapping for downstream area will be made. The plan will be informed to people at least 01 days before to prevent people and reduce the damage.
- Build a safe corridor for the flood (if necessary) based on forecast scenarios on the impact of space due to dam failure.
- These measures will reduce the impact during operation if they are implemented strictly.
- These measures also require the strict implementation of the principle of irrigation works protecting corridors under the ordinance exploitation of irrigation works.

2. Reservoir regulation, flood discharge in the case of large flood affecting downstream

To ensure the safety of Khe San reservoir, the spillway is designed considering to the unusual weather events due to climate change. The calculation frequency is based on National Standard on hydraulic works – QCVN 04-05:2012/BNNT and to ensure dischargeable of Probable Maximum Flood (PMF). However, the flood discharge will affect to downstream area.

As mentioned in Chapter V, the receiving water discharge from Khe San reservoir is a small stream flowing to Cac Cu reservoir with the storage capacity of 500,000m³. It is a water source to supply water for agriculture purpose of villages 9 and 10 of Quynh Thang commune. Cac Cu reservoir can only receive annual flood discharge of Khe San reservoir and then drain to Coc stream and to Vuc Mau reservoir – a big reservoir of the region. In case of large flood discharge, Cac Cu reservoir is not enough capacity to handle a large volumetric of water discharge into

the reservoir. So the risk of dam failure is assessed at high level and this will significantly impact to downstream area. Therefore, it should upgrade Cac Cu reservoir to ensure guarantee safety for lives and assets of local people at downstream area.

A inter-reservoir operation regulation of Khe San and Cac Cu reservoir should be developed and implemented with the following measures:

- Reservoir and dam Manager must notify prompt and accurate about flood discharge in order to help people in the community have the prompt response.
- At the time that the safety might be prone to insecurity as the rainy season, the reservoir should be observed regularly to ensure the reasonable water regulation.
- People and the local governments should have an active plan to cope with the disasters based on community.
- The monitoring system should be equipped to support operating officers in the forecast work.

7.2.5 *Environmental and Social Management Plan (ESMP)*

This ESMP is prepared in order to address critical environmental and social impacts/issues identified in the assessments and to provide common reference for all those involved in the implementation of the sub-project. This will also help guarantee that sufficient resources are allocated to implement the agreed measures. “Since 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 contractors to submit their own Contractors Environmental and Occupational Health and Safety Plan (CEOPSP) 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. We may need to refer to the World Bank Group EHS Standards. The CEOHSP should be reviewed and approved by MARD before any construction can commence.

Table 7.6. *Environmental and Social Management Plan*

Impacts	Activity Causing the Impact	Agreed Mitigation Measure	Est. Cost (VND)	Responsible Org.
<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>	<i>(5)</i>
<i>Preparation Period</i>				
General apprehensions by residents, farmers, women, other sectors about the impacts of and opportunities in the sub-project, which may lead to speculations and adverse perceptions about the sub-project and to conflicts.	Feasibility study/ESIA preparation	Conduct information drive and consultations with local communities		Project Owner and DARD
	Detailed Engineering and Program of Work	Prepare and implement a Communication Plan (Appendix B3)		
	Land, road right-of-way and/or easement acquisition	Prepare and implement a Gender Action Plan (Appendix B4)		
		Preparation and implementation of a		

Impacts	Activity Causing the Impact	Agreed Mitigation Measure	Est. Cost (VND)	Responsible Org.
(1)	(2)	(3)	(4)	(5)
	Procurement and Bidding	Resettlement Action Plan/ Compensation Plan in accordance with the World Bank OP/BP 4.12 Preparation and implementation of a Grievance Redress Procedure (Appendix B5)		
Construction Period				
Land/soil degradation in the construction site vicinities due to construction spoils, gravels, wastes materials and litters causing land deformation, compaction and changes in soil structures.	Construction spoils and waste materials Quarrying operation Campsite and stockyard operation	Require contractors to submit a Contractor's Environment and Occupational Health & Safety Plan incorporating construction-related measures identified in this ESMP, including relevant measures in Public Health Management Plan (Appendix B2) and standard construction practices of EHS. Dispose of construction spoils (i.e. excess embankment materials) in the designated landfill.		Contractor under DARD and Project Owner supervision
Impact on biodiversity and ecosystem	Land conversion (1ha) temporary use Construction activities: visual and noise nuisance	Avoidance of activities and excessive lighting at night Prohibit workers from poaching/hunting of birds and other wildlife in the area		Contractor under Project Owner supervision
Impact on air quality	Air emissions (SO _x , NO _x , CO _x) from equipment and machineries Dusts generated from earthworks and traffic	Regular sprinkling of roads with water during dry days Ensure only equipment with properly maintained engines are used.		Contractor under supervision of Project Owner

Impacts	Activity Causing the Impact	Agreed Mitigation Measure	Est. Cost (VND)	Responsible Org.
(1)	(2)	(3)	(4)	(5)
Increase noise nuisance	Operations of construction equipment and machinery	Avoidance of construction activities at night Hammering, grinding and blasting to be done only during daytime		Contractor under supervision of Project Owner
Impact on the surface water quality	Sediments from quarry and earthmoving activities	Excess embankment materials to be disposed of in the designated landfill which is situated on a naturally depressed area Provision of silt traps around stockpiles of embankment materials Immediate stabilization and/or compaction of exposed/loose soils		Contractor under supervision of Project Owner
Impact on the soil and groundwater quality	Fuel and waste oil spillage	Contractor to implement good housekeeping policy at the sites Contractors fuel storage tank to be placed on a concrete platform and provided with perimeter oil traps Fuel and used oils to be contained in barrels and stored in designated area		Contractor under supervision of Project Owner
Loss of crops, trees and properties	Acquisition of 1.0 ha temporary easements			Contractor under the Project Owner supervision
Interruption in irrigation water supply	Repair of the dam embankment and intake	Implement a staggered or modular construction strategy Consultation with farmers on the timing and construction		Project Owner under DARD supervision

Impacts	Activity Causing the Impact	Agreed Mitigation Measure	Est. Cost (VND)	Responsible Org.
(1)	(2)	(3)	(4)	(5)
		strategy to minimize cropping disruption Provide alternative source of water during construction		
Occupational health and safety issues	General construction activities: operations of heavy equipment	Compel contractor to practice good housekeeping Installation of proper warning signs and notices Require wearing of PPE		Contractor under DARD supervision
Increased public health and safety risk	General construction activities Contact with migrant workers	Installation of warning signs and notices of off limits. Fencing off of dangerous areas Provision of sanitation facilities including toilets at the site Medical screening of workers		Contractor under Project owner supervision
Chance archaeological/paleontological finds	Excavation at construction and quarry sites	Adoption and implementation of Chance Find Procedure (Appendix B7)		Contractor and Project Owner
Chance encounter of unexploded ordinance, mines	Construction activities in newly opened areas	Immediately secure the area and contact responsible agencies through the PPMU will be responsible for contacting the concerned agencies.		Contractor and Project Owner
Operation Period				
Solid waste and domestic wastewater	Operation of the new dam management house	Adopt and implement house rules and proper waste disposal.		Project Owner
Increased use of pesticides	Intensification of agricultural production in the	Introduction and/or support by MARD of an Integrated Pest Management program within the area.		MARD

Impacts	Activity Causing the Impact	Agreed Mitigation Measure	Est. Cost (VND)	Responsible Org.
(1)	(2)	(3)	(4)	(5)
	irrigation service areas			
Drowning/accident hazards at the dam	Opening of the dam site and facilities to the public Use of the reservoir and canals for recreation by local residents/children	Provision and maintenance of adequate warning signs, fences and guard rails. Provide a designated recreational area and organize residents to provide regular watchers or lifeguards.		Project Owner

7.2.6 Estimated cost of mitigation measures

Table 7.7. Estimated cost for Environmental and Social Mitigation

Table 7.7: Estimated cost for Environmental and Social Mitigation			
Activities	Mitigation measure works	Estimated cost (VND)	Implementing responsibility
Preparation stage:			
Transport of construction waste	- Equipping 10 canvases for the lorries for that have no canvas or replacing for old canvas.	2millions/canvas x 10 canvases = 20millions	Contractor
Assembling means and machines	- Make movement plan, assemble equipment reasonably to avoid effect on local people’s life		
Construction stage:			
Construction activities	- Non-use of the too old equipment, maintain periodically machines and equipment 6months/time	10millions/time * 1 time/1 year * 1 yrs. = 10millions.	Contractor
	- Spraying water periodically on the construction area and along the execution road line	Change by day	
	- Cover canvas for materials storage yards and material transport means	6millions	Contractor
	- Clean up and treat the volume of dogged sandy soil and weathered soil scatters on the ground	20 millions	Contractor

Activities	Mitigation measure works	Estimated cost (VND)	Implementing responsibility
	- At each construction site places 02 dustbins to keep waste from machines; and 02 dustbins keep normal waste	1 million /dustbin x 04 bins x 1 placing point = 4 millions	Contractor
	- Regularly collect and clean scattered materials - Classify solid waste and put rightly to bins as per required - Collect and treat rightly waste as per regulation	Service fee for waste collection and treatment 12millions/year * 1,5 years = 18 millions	
	- Economical use of water source - Constructing accumulation pit to collect construction wastewater, machines washing water to treat waste matter, colloidal sludge	10 million/1 construction site * 01 site = 10 million.	Contractor
	- Arrange the reasonable working schedule - Equip sufficiently labor safety instruments for workers -Holding the training, capacity building on labor safety and environmental protection before construction. - Organizing periodic medical check-up for workers on the construction site	- Equip labor safety instruments: 10 million/year * 1,5 years = 15 million. - Organize training on labor safety: 30 million/course *2 courses/year*1,5 years = 90 million.	Contractor
	- Make prevention plan of storm, tropical low pressure, whirlwind. - Disseminating the response plan. - Organizing maneuver.	- Arrange periodic medical check-up: 20 million/year *1,5 years = 30 million.	Contractor
Production activities of concrete components	- Economical use of water source - Constructing wastewater collection system, accumulation pit for treatment before discharge to environment	Expenses included in construction accumulation pit	Contractor
	- Maintain machines periodically		
			Contractor

Activities	Mitigation measure works	Estimated cost (VND)	Implementing responsibility
Materials transport activities	<ul style="list-style-type: none"> -Transport in the regulated time - Carry loading capacity rightly as per regulated and having guarded canvas. Equip more 20 canvases for lorries have no canvases or replacing for too old canvases. - Run follows the speed limit. 	02 million/canvas x 20 canvases = 40 millions	
Life activities of staffs and workers	Purchase 03 flexible latrines.	30millions/latrine x 2 units = 60millions	Contractor
	<ul style="list-style-type: none"> - Equip 03 dustbins to collect rubbish at the tents - Clean up regularly - Contract with environmental sanitation agency of local to transport and treat waste 	2millions/dustbin x 03 bins x 01 tent = 6 millions - The transport and rubbish treatment fee 20millions/year *1,5 years = 30 millions	Contractor
Repair and return the road lines that have been damaged	<ul style="list-style-type: none"> - Repair, levelling and improve the damaged, depressed and low quality road lines 	80 millions	Contractor
Environmental monitoring during construction time	<ul style="list-style-type: none"> - Take the sample for observation and monitor environment quality at construction site (1.5 yrs.) 	239,919,000 VND(See the detailed estimation in table 7.9)	Environmental consultant
Operation stage			
Return whole construction area: tent area, dumping ground, soil exploitation area	<ul style="list-style-type: none"> - Dismounting tents, signs - Gathering, and selling for user. -Assembling and movement of machines, construction equipments. - Fill up and levelling the ground of explosion field. 	50millions	Contractor
Reservoir and dam operation and maintainance	<ul style="list-style-type: none"> - Organise to inspect the maintainance regularly and periodically. - Discover and tackle opportunely the encroachment and use canal line out of purpose. 	O&M budget	PPMU
Traning and incidents prevention	<ul style="list-style-type: none"> - Arrange the training on coping with unexpectd events with frequency of 1 time/year 	O&M budget	PPMU

Activities	Mitigation measure works	Estimated cost (VND)	Implementing responsibility
	according to proposed program of Department of Agriculture and Rural Development (DARD).		
Dredge irrigation	<ul style="list-style-type: none"> - Operate water sluice flexibly; - Observation and monitor to find out the region that get accumulation or erosion state; - Get the periodic canal dredge plan to guarantee water flow and environment 	O&M budget	PPMU
Operating close and open sluice gate	<ul style="list-style-type: none"> - Regularly monitor the salty level, regional hydrology regime - Operate water inlet sluice flexibly and timely 	O&M	PPMU
	Total cost	VND 798,919,000 ()	

7.3 Environmental and Social Monitoring Plan (ESMoP)

7.3.1 Environmental Monitoring Program

Table 7.8. Environmental monitoring in construction and O&M period

Environment component	Target	Method	Location and Frequency
Air	PM10 PM2.5 The concentration of NO ₂ , The concentration of SO ₂ , The concentration of CO	Measuring and sampling continuously in one day. The measures for sampling, observation, measurement and analysis have been done according to the current Vietnam regulations.	Conducting supervision the air quality and noise at (i) the reservoir bed region (ii) transport line and (iii) the residential area near the reservoir at 2 positions. + 01 point at the main dam region of Khe San reservoir + 01 point at the material mine of Khe San reservoir One during construction season and another during first year operation phase. Both will be done during dry season.
Surface water	pH, DO, BOD ₅ , COD, TSS, NH ₄ ⁺ ,		Conducting supervision of the surface water quality at 02 points (i) the reservoir bed area, and (iii) the main canal line.

Environment component	Target	Method	Location and Frequency
			The measurements and sampling will be conducted twice a year from year 1 of construction up to one year after the completion of the works.

7.3.2 Social monitoring program

i) Social monitoring program in construction period

Table 7.9. Social monitoring in construction period

No	Type	Position	Frequency	Norm
I	Monitoring the social impacts			
	Social impact	Commune at downstream	6 months/time	Income, employment, the number of crops, average yield, water supply calendar Reflection and complaint of local residents
II	Monitoring environmental sanitation and labor safety			
1	Environmental sanitation	Construction sites, Tents of workers Dumping ground Material storage ground	3 months/time	Quantity and condition of latrines Quantity and condition of sanitation instruments First aid box Health activity The number of infectious cases Communication plan on community health
2	Labor safety	Construction sites, Tents of workers Dumping ground Material storage ground	3 months/time	Labor safety instruments Safety note The number of accidents

ii) Social monitoring program in operation period

Table 7.10. Social monitoring in operation period

No	Type	Position	Frequency	Norm
1	Social impacts	Communes get benefits	6 months/time	Income, employment, the number of crops, average yield, water supply calendar Reflection and complaint of local residents

Map of sampling positions for environment monitoring as presented in Annex A2

7.3.3 Estimated cost for environmental and social monitoring

Table 7.11. Estimated cost for Environmental and social monitoring in Construction period

No	Items	Unit	Amount	Unit price (VND)	Cost (VND)	Cost (USD)
I	Monitoring waste source management				10,000,000	476
1	Arising source	Time	1	5,000,000	5,000,000	238
2	Measures to manage emission	Time	1	5,000,000	5,000,000	238
II	Monitoring impacts to natural environment				19,520,000	929
1	Air analysis				1,590,000	75.7
	Respiratory dust PM10	Sample	1	100,000	100,000	4.7
	Respiratory dust PM2.5	Sample	1	100,000	100,000	4.7
	Total cost of analysis 01 sample	Sample			265,000	12.6
	Analysis cost 3 points x 2 samples/day	Sample	6	265,000	1,590,000	75.7
2	Surface water analysis				1,710,000	81.4
	pH	Sample	1	30,000	30,000	1.4
	Dissolved Oxygen (DO)	Sample	1	60,000	60,000	2.8
	Total suspended solid (TSS)	Sample	1	50,000	50,000	2.4
	BOD ₅	Sample	1	175,003	175,003	8.3
	NH ₄ ⁺	Sample	1	241,953	241,953	11.5
	Coliform	Sample	1	60,000	60,000	2.8
	Turbidity	Sample	1	70,000	70,000	3.3
	Cost for analysis 01 sample	Sample	1	570,000	570,000	27
	Total cost for analysis 3 positions x 1 time	Sample	3	570,000	1,710,000	81
III	Monitoring social impacts				5,000,000	238
	Social impact	Time	1	5,000,000	5,000,000	238
IV	Monitoring environmental sanitation and labour safety				10,000,000	476
	Environmental sanitation	Time	1	5,000,000	5,000,000	238
	Labor safety	Time	1	5,000,000	5,000,000	238
V	Expenses 3 staffs x 3 days		9	350,000	3,150,000	150
VI	Car for sampling analysis (fixed price, estimated 5 million 1time)	Time	1	5,000,000	5,000,000	238
VII	Make monitoring report for each time	Set	1	4,000,000	4,000,000	190

No	Items	Unit	Amount	Unit price (VND)	Cost (VND)	Cost (USD)
VIII	Total estimated cost for monitoring 1 time (plus I-VII)	Time	1		56,670,000	2698
IX	Total estimated monitoring cost 1,5 years (3 times)	Time	3	56,490,180	170,010,000	8095
X	GENERAL MANAGEMENT COST: TT*20%		C		34,002,000	1619
XI	Total cost before tax		TC		204,012,000	9714
XII	Tax GTGT: (VAT)= 10% x (TC)		VAT		20,401,200	971
XIII	Cost for environmental monitoring in construction period		G		224,413,200	10686
	Round number	275,474,000 VND				13,117USD

Table 7.12. Calculation cost of environmental and social monitoring in operation period

No	Estimated cost for items	Unit	Amount	Unit price (VND)	Cost (VND)	Cost (USD)
I	Monitoring impacts to natural environment				21,150,000	
1	Surface water analysis				6,150,000	
	pH	Sample	1	30,000	30,000	
	Dissolved Oxygen (DO)	Sample	1	60,000	60,000	
	Total suspended solid (TSS)	Sample	1	50,000	50,000	
	BOD ₅ (20°C)	Sample	1	80,000	80,000	
	Cost for analysis 01 sample	Sample			2,050,000	
	Total cost for analysis 3 position x 1 time	Sample	3	2,050,000	6,150,000	
2	Monitoring landslide	Time	1	15,000,000	15,000,000	
II	Monitoring social impacts				5,000,000	
	Social impacts	Time	1	5,000,000	5,000,000	
III	Expenses 3 staffs x 3 days		9	350,000	3,150,000	
IV	Car for taking sample analysis (fixed price, estimated 5 million 1 time)	Time	1	5,000,000	5,000,000	

No	Estimated cost for items	Unit	Amount	Unit price (VND)	Cost (VND)	Cost (USD)
V	Conducting report for each time	Report	1	4,000,000	4,000,000	
VI	Total cost for monitoring 1 time (add I-V)	Time	1		38,300,000	
VII	Total cost for monitoring 1.5years (3 times)	Time	3	38,300,000	1114,900,000	
VIII	GENERAL MANAGEMENT COST: TT*15%		C		17,235,000	
IX	Total cost before tax		TC		132,135,000	
X	Tax GTGT: (VAT)= 10% x (TC)		VAT		13,214,000	
XI	Cost for environmental monitoring in operation period		G			
AROUNDED NUMBER		145,349,000 VND				6,278USD

7.3.4 Environmental management training and capacity building

Table 7.13. The cost of capacity building and training implementation

Content		Trainees	Quantity	Cost (VND)	Fund
Training on food hygiene, occupational safety and environmental protection		Workers and technical staff of contractors	All of workers, staff	50 people x 200,000 VND /person = 10,000,000 VND	To be included in the investor's contract with stakeholders
Training on Environmental Management	Control of emissions sources	PPMU staff	3 people	500,000 VND /person x 3 people = 1,500,000 VND	To be included in the investor's contract with stakeholders
	Impact assessment, environmental risk control	PPMU staff	3 people	500,000 VND /person x 3 people = 1,500,000 VND	To be included in the investor's contract with stakeholders
	Environmental Monitoring	PPMU staff CSC staff	8 people (3 PPMU staff and 5 CSC staff)	500,000 VND /person x 8 people = 4,000,000 VND	To be included in the investor's contract with stakeholders
	Raising awareness and accessing to the	PPMU staff CSC staff	8 people (3 PPMU staff and 5 CSC staff)	500,000 VND /person x 8 people = 4,000,000 VND	To be included in the investor's contract with stakeholders

Content		Trainees	Quantity	Cost (VND)	Fund
	environmental legal system				
	Training and capacity building for environmental monitoring	CSC staff	5 people	5 people x 1,000,000VND/person = 5,000,000 VND	To be included in the investor's contract with stakeholders
Training for CSB		CSC staff	2 people/ 1 commune x 1 commune = 2 people	2 people x 1,000,000 VND/person = 2,000,000 VND	To be included in the investor's contract with stakeholders
Total (VND)				28,000,000	

Table 7.14. Summary of total cost for conducting Environmental and Social Monitoring Plan

No	Monitoring content/ period	Implementing	Implementing responsibility	Cost (VND)
I	Construction period		The agency has sufficient legal status and hired by Project Owner	275,274,000
II	Operation period		PPMU	145,349,000
III	Training, capacity building		PPMU	28,000,000
	Total (I+II+III)			448,623,000

Monitoring report requirement

The reports will be developed during the time implementing monitoring programs, conducting the collection of reports on impacts or the recommendation from local residents for subproject. The effect assessment of mitigation measures was implemented.

Table 7.15. The types of Environmental and Social monitoring report

Implementation responsibility	Type of report	The content of report	Frequency for submit the report	Submit to
Execution contractor	Report on accident/risk	Collecting information on accident or unexpected problems	Within 24 hours since having problem	Subproject management committee and Execution monitoring consultation
	Infringement report	Provide information in violation acts regulations in environmental and social management	Within 01 week from the matter happens	Subproject management committee and Execution

Implementation responsibility	Type of report	The content of report	Frequency for submit the report	Submit to
				monitoring consultation
	Report	Take note and report to appropriate authorities on archaeological relics, royal tombs have been newly discovered	Within 24 hours since discovering archaeological relics, royal tombs	Subproject management committee, Execution monitoring consultation and Department of Culture, Sports and Tourism
	Report on the implementation of ESMP	The report on results of implementing measures to minimize adverse environmental and social impacts	Every month	Subproject Management Committee
Construction supervision consultant	Report on the implementation of measures to minimize environmental and social impacts	<ul style="list-style-type: none"> -Assessing implementation results of measures to minimize environmental and social impacts of construction contractors - Results of solving and overcoming problem and shortcomings from previous report 	Every month	Subproject Management Committee
Independent environmental consultant	Independent monitoring report on environmental and social safety	<ul style="list-style-type: none"> - The inspection result of construction site - Result of Community based supervision - Collecting and classifying the monitoring result of execution monitoring consultant - Result of environmental monitoring - Assessing the result of ESMP implementation and the recommendation 	6 months /time or 3 months/time	Subproject Management Committee and WB
Subproject Management Board	Report on environmental activities of subproject	Result of ESMP implementation	6 months/time	CPO and WB

7.4 ESMP Implementation Arrangement

7.4.1 Agencies and responsibilities

a) Responsibility of subproject owner/Subproject management Board

Take responsibility for performing safeguard policies of subproject, supervising daily activities of subproject and monitor and manage the project construction quality, supervising the conformity with the environmental safety in construction activities of subproject.

b) Responsibility of Contractor

Contractor has responsibility for conforming to regulations during construction process as contracted with PPMU. The contractor will prepare Contractor Environment and Occupational Health and Safety Plan (CEOHSP) taking into consideration of the subproject ESMP, the bidding document requirements and explain the construction schedule, material, equipment and manpower requirement and plan for mitigating site specific issues. This plan will be reviewed and approved by CPO/PMU.

c) Responsibility of Execution supervision consultant

This unit has been hired by PPMU and will be on behalf of PPMU to supervise and take note everyday about the conformity with environmental and social safety policies of construction contractor.

d) Responsibility of independent supervision consultant on environmental and social safety

Assist PPMU in effect assessment of mitigation measures and propose the adjustment of application environmental and social safeguard policies in necessary case;

Make monthly report on the conformity with environmental and social safeguard policies of contractor and submit to PPMU, this report will be the basis for contractor pay environmental and social protection expenses;

Report to PPMU “detections” during construction time.

e) Responsibility of local authorities and Community

The Community Supervision Board has been established according to “Decision No.80/2005/QĐ-CP dated 18/04/2005 of Prime Minister on investment supervision status of community”. Community Supervision Board of commune has right and responsibility for supervision construction activities and negative impacts caused by construction activities, ensure measures to minimize the potential negative impacts must be performed effectively. In case of environmental problems arising that affects to community, they will report to construction site supervision consultant (CSC) and/or PPMU to fill in the information feedback notes on environmental safety.

f) Responsibility of reservoir management and development agency

Take responsibility for maintenance and periodic supervision of project works

g) Responsibility of CPO

Guiding provincial Project management Board to carry out environmental and social management plan of subproject. Supervising progress of subproject during construction time and the first operation year.

h) Responsibility of Department of Natural resources and Environment

Has responsibility to carry out environmental policies as per regulations of Vietnam Government.

7.4.2 Assessment of existing environmental and social management practice and capacity for dam management

Currently, Khe San reservoir is under management of Reservoir's Management Board. However, staffs in the Board are responsible for only management and operation of the work as well as detection of incidents. Environmental and social practice has not been carried out properly.

There are activities of the people can make harmful to the work such as grazing poultries on the dam slope or cultivating within safety corridor of the work. Much plants growing on the dam face slope, especially large trees, will facilitate animals burrowing, living; decayed roots leaving pores, affecting infiltration safety of the dam, increasing the risk of dam destabilization and hindering visibility when checking.

To ensure safety of the work after upgrading and improvement, it needs to enhance awareness of people and capacity of staff in reservoir management board of environmental and social management practice for the dam.

7.4.3 Building capacity and improves the knowledge on the environmental and social protection training/coaching programs

To increase the capacity and technique in environmental management for staffs of Subproject Management Board, organizations and relevant individuals, the Subproject Management Board conducts the following training contents:

- Heighten capacity in environmental management and supervision;
- Communication to increase awareness in environmental protection;
- Training in preventing and fighting fire
- Training in environment regulations and standards
- Training in environmental health and labor safety measures, environmental safety
- Training to increasing awareness in dam safety
- Training to increasing awareness in infectious disease
- Training to increasing awareness in gender equality
- Training to increasing awareness in ethnic minority development.

7.5 Community Development Need Assessment

The sub-project implementation may arise negative impacts to local community. A community development needs assessment identifies the strengths and resources available in the community to meet the needs as well as potential impacts of sub-project to community development. The needs assessment will be:

- To learn more about what your group or community needs are;
- To become aware of possible needs;
- To make sure any actions you eventually take or join in are in line with needs that are expressed by the community.

CHAPTER VIII. STAKEHOLDERS CONSULTATION

8.1 Public Consultation Objectives

Public consultation for Project is required in the ESMP completion process. Community involvement and consultation has been carried out to:

- Provide useful information, the better understanding on subproject, potential impacts and possible improvements for the project;
- Allow the controversial issues appear at initial stage;
- Create opportunities to solve problems early;
- Help to develop transparent procedures to implement proposed project, and to create responsibility and local ownership in project implementation process.
- Operation Policies WB (OP 4.01) on environmental impact assessment requires that affected groups and non-governmental organizations and local notification are informed;

The participation was activated in the project preparation process under certain conditions and is often recommended as part of the implementation.

8.2 Environmental Impact Assessment Consultation

8.2.1 Consultation process

i) 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

ii) 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

iii) Consultation measures

Arrange the meeting with the above participant includes: local authorities, local organizations, 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.

iv) Consultation results

Participated commune	Location	Time	The number of participated people	Nmber of female
Quynh Thang	Quynh Thang cooperative	10h dated 02/03/2015	50	22

The ideas from local authorities

The subproject receives many ideas from Commune People's Committee and Fatherland Front Board in subproject area. In general, the ideas from local authorities can be summarised as follows:

- The People's committee of Quynh Luu district and Commune People's Committee and Fatherland Front Board of communes totally support the development of subprojec. Proposing PPMU coordinates with consultant unit to organize times for disseminating information relating to subproject, propagandize for the local to understand the purpose as well as the benefits of subproject. When the subproject is commissioning, the production and life condition of the local people will be improved;
- The local will create all favourable conditions and maximum support for subproject, especially with land acquisition issue during land clearance and construction subproject's main works periods;
- The People's committee of Quynh Luu district and Commune People's Committee and Fatherland Front Board of communes also agree with the issues relate to environmental and social impacts as presented in the report. Most impacts of subproject are positive impacts, they will make given impacts to environment and life activities of the local residents in the project area;
- Agree with the measures to minimize environmental pollution as presented in the report;
- Propose with project owner to apply appropriate regulations with committment to minimize the adverse impacts as well as environmental quality management and supervision;
- Commune People's Committee and Fatherland Front Board of commune are ready for cooperation to respond to potential issues during project implementation.

The ideas from local residents

Besides the support ideas from households, the local people also give out many ideas and requirements to develop subproject. These ideas have been summaried as follows:

- The local community agrees with the impacts causing by subproject during the project construction, also they require the contractor executes must be guaranteed quality and time progress;
- Propose with appropriate authorities quickly approve for subproject can be done soon;
- To minimize the impacts to the life of community during construction time, the subproject's works must be done quickly and to be fished one by one before changing to the other items;
- Require the contractor and project owner listen attentively the feedback from community to have corressponding reform. The ideas from community must be sent

to organizations, Community supervision board, Commune People's Committee, PPMU and relevant organizations;

- Require the contractor must do commitment rightly to minimize the adverse impacts as per presents in Environmental and Social management and Monitoring plan;
- The irrigation canal systems had been downgraded with phenomena of water leakage and accumulation hence results in the bad water conveyance. The water shortage happens mainly with high paddy fields meanwhile the water in reservoir is not deficient by the loss of water on the canal system. The locals desire the subproject supports for the improvement and dredge the irrigation canal system from Khe San reservoir to ensure irrigation water;
- The local people are worried about the widening of aquaculture activity on Khe San reservoir after it has been upgrading and improvement that causes the decline of water quality in reservoir, water source pollution risk, epidemic diseases when using water supplies to fishing ponds.
- Request PPMU applies measures and regulation on penalizing or terminating unilaterally with contractor, supervision unit if they do not obey adequate safety measures and timely propose environmental protection measures.

8.2.2 *Commitment of the subproject owner*

Project Owner acknowledged ideas and has timely adjustment in design documents and simultaneously commits doing well the measures to mitigate negative impacts by subproject's activities.

8.3 Social Impact Assessment Consultation

i) The consultation attendant:

- Commune People's committee
- The affected households

ii) 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 effected people, complaint 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.

iii) Consultation method

Immediately starting project preparation, local authorities leadership at all levels of Quynh Thang commune, Quynh Luu district, Nghe An 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.

iv) Consultation result

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 Nghe An 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 is Quynh Thang 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 implemented soon.

8.4 ESIA Disclosure

According to WB's policy on access to information, draft ESIA of the subproject in Vietnamese language was locally disclosed on the project website, and subproject sites accessible to locally-affected people and local NGOs and the English version was disclosed on the Bank external website. The final updated ESIA report in Vietnamese language will be locally disclosed on the project website and subproject sites accessible to locally-affected people and local NGOs, and the English version will be disclosed on the Bank external website. .

CONCLUSION, RECOMMENDATION AND COMMITMENT

CONCLUSION

The subproject belongs to Group B in environment as per environmental safety policy of WB;

The subproject does not locate in sensitive position with environment and it does not commit any criterion “ineligible” of WB;

This report determines and assesses completely the significant impacts in 03 phases: before, during construction and operation phase and it also indicates measures to minimize the adverse impacts with the consultation of local authorities, affected people and vulnerable people group;

The Environmental and Social Management Plan (ESMP) and The Environmental and Social Monitoring Plan (ESMoP) to supervise the impacts have been developed to help the authorities make decision and they update regularly in process of subproject;

The subproject upgrading and safety guarantee of Khe San reservoir, Nghe An province has been owned by Department of Agriculture and Rural Development and managed by Water resources development and management Board of Nghe An province. The project construction can cause the potential positive and negative impacts during project implementation:

The potential impacts during the project preparation period

During the project preparation, using temporarily 10,000 m² land to construct auxiliary area and works serve for construction.

The potential impacts during the subproject's construction

The upgrading of works includes: dam, auxiliary works, irrigation canal, management road can cause some adverse impacts such as: a) increase the risks for local residents along the road due to the increase of material and rubbish transport means; b) The increase of noise, dust, exhaust fumes and vibration due to the operation of machines, equipment will cause effects to the health of local people and workers along the road if they contact with this pollution source in a long time; c) arising social evils due to the workers are present there such as: theft, gambling, drugs and infectious diseases; d) Soil, rock, canal construction materials can be scattered on the flow, paddy field of local farmers.

The potential impacts during the subproject's operation

During operation period, the dams can be landslide and eroded causing the unsafety for local residents at downstream. In addition, at the downstream of breakdown spillway, in rainy season if the water level increases over spillway level then it will cause effect to livelihood of farmers such as: paddy field, fishing ponds and farmhouses of the local.

The measures to minimize adverse impacts in construction period

The appropriate measures to minimize adverse impacts of upgrading dam and auxiliary works include: a) Implementing Resettlement action plan; b) Implementing mitigation measures such as: minimizing dust, exhaust fumes, noise, vibration; reasonable operation of equipment and machines; suitable working schedule to avoid rainy days; apply safety measures and health guarantee at the construction site; c) reasonable human source management (choice human source, guidelines in health, safety, infectious prevention, community interaction and develop regulations at the tents for workers and have measure to deal with violator; and d) communicate well with the local community (coordinate to work with local authority, inform to local people and prioritize to hire the local labor)

The measures to minimize adverse impacts in operation period

The operation management unit of Khe San reservoir supervises periodically the safety of reservoir; coordinates closely with Commune People's Committee and local people to report timely risks relates to dam safety and has opportune repair; appoints somebody monitors regularly and keeps watch to ensure rational water regulation in flood season; has plan to inform to local residents on flood discharge plan

Environmental and social monitoring

The winner of bid must prepare ESMP at the construction site, it will be the basis for environmental supervision by appropriate authorities, provincial Project Management Board and supervision consultant. An environmental monitoring system has been prepared and approved by WB will be applied for subproject. The supervision consultant regularly supervises and report to provincial Project Management Board every month. This report will be independent with environmental report of province that submit to Central Projects Organization (CPO)/PMU.

RECOMMENDATION

Based on the detection on environmental assessment and Environmental and Social Management Plan (ESMP) in this document, these recommendation can be proposed for subproject:

The mitigation measures mentioned in ESMP will be included in the bid documents. The contractor will split volume of works and estimate total cost for implementing those mitigation measures. This expense is safe cost on environment and it will be paid when all measures will be performed well as committed by Contractor.

Based on the Environmental and Social Impact Assessment, safety policy consultant and Subproject management Board petition appropriate authorities and WB for approval ESIA of the subproject upgrading and safety guarantee of Khe San reservoir project, Nghe An province to be the basis for deploying next steps and guarantee subproject schedule

COMMITMENT OF PROJECT OWNER

All ideas of community has been recorded by Project Owner. The Project Owner commit to apply all mitigation measures that proposed by consultant experts in Chapter 6 of this report. Project Owner undertakes to apply strong measures such as penalty measure to contractor if the contractor does not perform measures to minimize adverse impacts.

The subproject owner committed:

1. To conform strictly and guarantee environmental parameters in accordance with Vietnam standards (National technical norms/Vietnam standards) follows current regulations on environmental quality parameters.
2. Perform all measures to project water source and environment among the measure to minimize adverse impacts as stated in ESIA and ESMP reports.
3. Project Owner undertakes to take full legal responsibility with Social republic of Vietnam in case of infringing upon international Convention, Vietnam standards on Environment and when occurrence the environmental problem.
4. Project Owner was committed to strictly conforming with legal regulations on compensation, surmounting environmental risks in case of the environmental risks occur due to the subproject development.

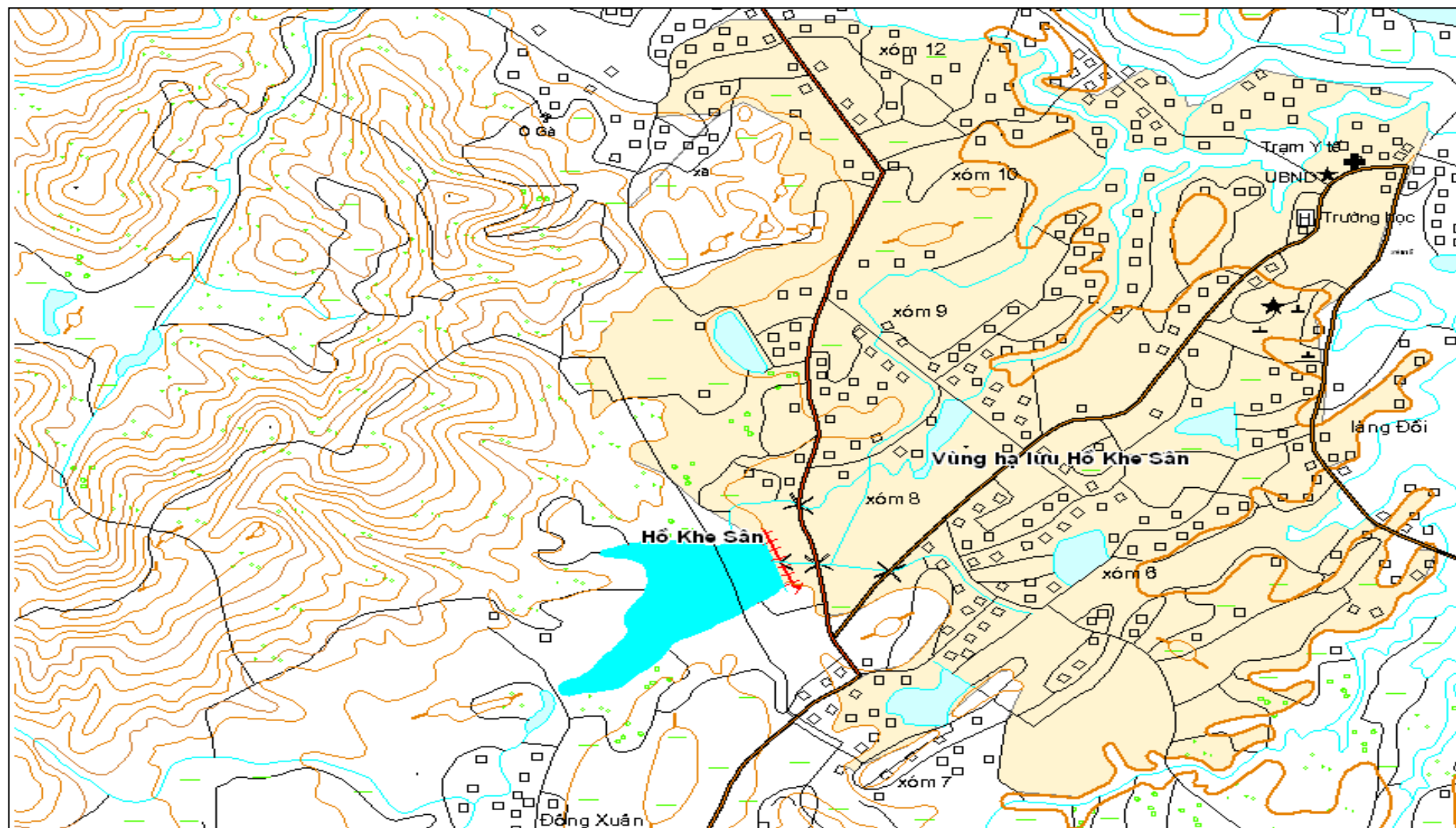
REFERENCES

1. Nghe An Hydraulic Engineering Consultants Joint-stock Company (2014), Repairing and upgrading Khe San reservoir. Project demonstration.
2. Department of Environmental appraisal and impact assessment (2011). Environmental impact assessment handbook, Volume I and II.
3. Socialist Republic of Vietnam, Decree 121/2010 / ND-CP on Amending and supplementing a number of articles of Decree No. 142/2005 / ND-CP in November 14, 2005 of Government on land and water surface rent.
4. Socialist Republic of Vietnam, Decree 142/2005/ND-CP November 14, 2005 of Government on land and water surface rent.
5. Socialist Republic of Vietnam, Decree 45/2014/ND-CP in May 15, 2014 in fee of land use.
6. Socialist Republic of Vietnam, Decision 134/2010/QĐ-TTg on compensation and resettlement assistance in building hydroelectric/irrigation construction.
7. Department of Environmental appraisal and impact assessment, General guideline for environmental impact assessment of investment project, Hanoi, 2010.
8. Le Trinh (2000). Environmental impact assessment: Measure and Application. Science and Technique Publishing House.
9. Nghe An Union of Science and Technology Association, Final report of scientific project “Evaluation of compensation policies, support clearance and resettlement for some specific projects in Nghe An Province.”
10. The 13th National Assembly of The Socialist Republic of Vietnam, Law on Land 2013.
11. Pham Ngoc Dang (1997). Air Environment. Science and Technique Publishing House.
12. Pham Ngoc Ho, Hoang Xuan Co (2004). Environmental impact assessment. Vietnam National University Publishing House.
13. Phùng Chi Sy, Nguyen Thi Quynh Huong, Chu Thi Sang (2009). Support harmonization of environmental impact assessment under the Hanoi Declaration on Aid Effectiveness.
14. Monitoring and environmental technology center of Nghe An (2010). Environmental impact assessment report of project “Khe Lai – Vuc Mau reservoir construction, Quynh Luu district, Nghe An”.
15. Council People Committee of Quynh Thang commune (2013), “Socio-economic implementation tasks in 2013 and development orientation in 2014”.
16. Council People Committee of Nghe An province, Decision No.111/2014/QĐ-UBND December 30th, 2014 on public soils price from 01/01/2015 to 31/12/2019 in region of Quynh Luu district.
17. Council People Committee of Nghe An province, Decision No. 04/2010/QĐ-UBND in 19/01/2010 on compensation, supporting and resettlement while recovered land by State in region of Nghe An province.
18. Institute for Water and Environment (2015) Resettlement action planning report(RAP) of sub-project Strengthening Khe San reservoir security, Nghe An province;
19. Institute for Water and Environment (2015) Social impact assessment report of sub-project Strengthening Khe San reservoir security, Nghe An province;
20. Institute for Water and Environment (2015) Dam security report of sub-project Strengthening Khe San reservoir security, Nghe An province;

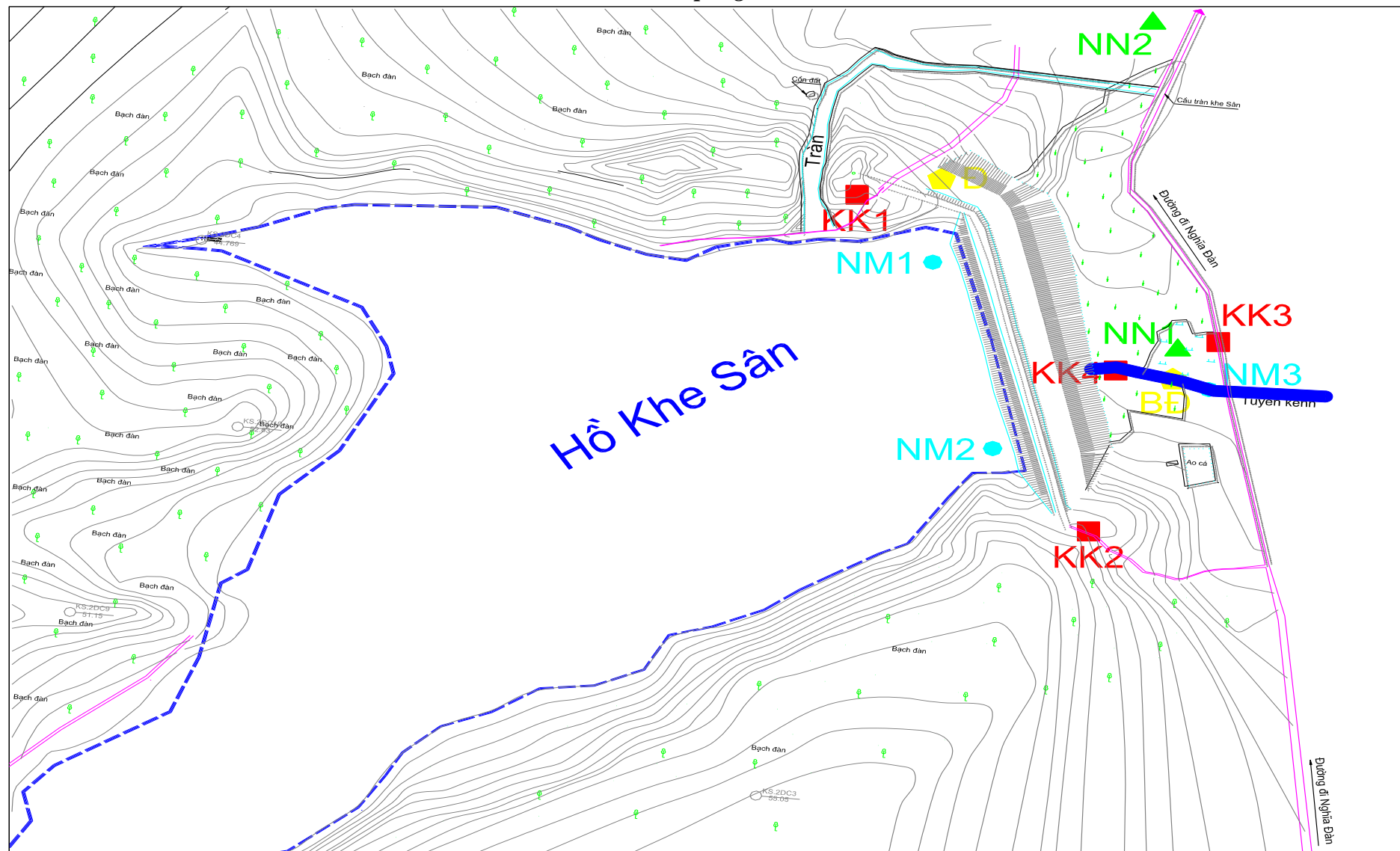
21. WB – Environmental security policies (updated 2013), Hanoi
22. WB – Legal security policies (updated 2012), Hanoi
23. WB – Social security policies(updated 2013), Hanoi
24. WB Vietnam, research on State mechanisms on voluntary land recovery and transfer in Vietnam – Approach method, land assessment and complaint settlement of citizen.
25. Maps and survey data and documents.

Appendix A2 - TYPES OF MAP

A2_1. Map of subproject location



A2_2. Sampling location



Appendix A3 - POLICY FRAMEWORK, INSTITUTION AND REGULATION

A. Legal framework related to environmental protection

- Decree No. 18/2015/NĐ-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/NĐ-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;
- Decision No. 22/2006/QĐ-BTNMT dated 25/12/2006 of MONRE on forcing Vietnam National Standards of environment application.

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

- Law on Land No. 45/2013/QH13 approved by Vietnam National Assembly dated 29/11/2013;
- Decree No.44/2014/NĐ-CP, dated 15/05/2014 regulating the land price;
- Decree No. 47/2014/NĐ-CP, dated 15/05/2014 regulating the compensation, support and resettlement in cases of the land recovered;
- Decree No. 37/2014/NĐ-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.

C. 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/NĐ-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;
- Decree No. 12/2009/NĐ-CP dated 10/02/2009 on managing the construction and investment projects.

D. Legal framework related to integrated water resources exploitations and forest protection, cultural heritage and biodiversity

- Law on Water Resources approved by Vietnam National Assembly dated 21/06/2012;

- Decree No.42/2012/NĐ-CP, dated 11/05/2012 of Government on managing and using of rice land;
- Decree No. 112/2008/NĐ-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/NĐ-CP dated 01/12/2008 of Government on River Basin management;
- Decree No. 72/2007/NĐ-CP dated 07/05/2007 of Government on Dam safety management;
- Decree No. 149/2004/NĐ-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;
- Law on Biodiversity No.28/2008/QH12 approved by Vietnam National Assembly dated 13/01/2008. Chapter III- Natural Ecosystem conservation and sustainable development, and Chapter IV- Creature Conservation and Development.

E. National Policy on Dam safety

- Ordinance No. 32/2001/PL-UBTVQH10 dated 04/4/2001 on exploitation and protection of hydraulic structures;
- Ordinance No. 27/2000/PL-UBTVQH10 dated 24/8/2000 on revising and supplement some Articles of Ordinance No. 9-L/CTN dated 20/3/1993.
- Decree No. 72/NĐ-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/NĐ-CP;
- Circular No. 34/2010/TT-BCT of Ministry of Industry and Trade dated 07/10/2010 regulating safety management of Eclectric Generation Reservoirs.
- Decree No. 143/2003/NĐ-CP dated 28/11/2003 regulating in details of implementation of some Articles of Ordinance No. 32/2001/PL-UBTVQH10 dated 04/4/2001 on exploitation and protection of hydraulic structures;
- Decree No.115/2008/NĐ-CP dated 14/11/2008 on revising and supplement some Articles of Decree No. 143/2003/NĐ-CP.

F. Resettlement policy

- The Constitution of Vietnam Socialist Republic (1992) confirmed the people rights on house ownership and house ownership protection.
- The Constitution of Vietnam Socialist Republic 2013.

- Law on Land No. 45/2013/QH13 on administration regulations of land in general. Law on Land 2013 instead of the previous Land Laws in 1987 and 1993.
- Law on Complaints No. 02/2011/QH11 approved by Vietnam National Assembly.
- Decree No. 43/2014/ND-CP dated 15/5/2014 on the Land Law enforcement.
- 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. 38/2013/ND-CP dated 23/4/2013 on managing and use of Official Development Assistant Fund (ODA).
- 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.
- Decision No. 1956/2009/QĐ-TTg dated 17/11/2009 of Prime Minister on approving the Overall Strategy of Career training for rural labour to 2020.
- Decree No. 197/2004/NĐ-CP of Government dated 03/12/2004 on compensation, support and resettlement in cases of land recovered.
- Circular No.116/2004/TT-BTC dated 17/12/2004 of Government on guiding the implementation of Decree No.197/2004/ND-CP, dated 03/12/2004 on compensation, support and resettlement in cases of land recovered.
- Decree No.188/2004/NĐ-CP of Government on the methods of determining land price and land price frame for each type of land.
- Circular No.36/2014/TT-BTNMT dated 30/6/2014 regulating the methods of land price assessment, construction and land price adjustment.
- Circular No. 114/2004/TT-BTC, dated 16/11/2004 guiding the implementation of Decree No. 188/2004/NĐ-CP.
- Decree No.17/2006/NĐ-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/NĐ-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.
- Decree No. 123/2007/NĐ-CP, dated 27/7/2007 on revising and supplement some Articles of Decree No.188/2004/NĐ-CP, dated 16/11/2004 on the methods of determining land price and land price frame for each type of land.
- Decree No. 69/2009/NĐ-CP of Government dated 13/08/2009 regulating the additional planning regulations on land use, land price, land recovery, compensation, support and resettlement.
- Decision No. 52/2012/QĐ-TTg of Government dated 16/11/2012 on support policy of employment and career training for labors who have land recovered.

G. Gender policy

- Law on Gender Equality No. 73/2006/QH11 approved by Vietnam National Assembly dated 29/11/2006;
- Direction No. 07/2007/CT-TTg 3/5/2007 of Government on the Law on Gender Equality enforcement;
- Decree No. 70/2008/NĐ-CP dated 4/6/2008 of Government regulating in detail on implementation of on Gender Equality;
- Decree No. 55/2009/NĐ-CP dated 10/6/2009 of Government on administration sanctions of gender equality;
- Decree No. 48/2009/NĐ-CP dated 19/5/2009 of Government on the measures of ensuring gender equality;
- Circular No. 191/2009/TT-BTC dated 1/10/2009 of Ministry of Finance guiding the use and management of of funds for gender equality and women advancement;
- Circular No. 07/2011/TT-BTP dated 31/3/2011 of Ministry of Justice guiding the gender equality ensure in staff arrangement and legal support activities;
- Decision No. 2351/QĐ-TTg dated 24/12/2010 of Prime Minister approving the National Strategy on Gender Equality for 2011 – 2020 period.

H. Poverty reduction policy

- Decision No. 33/2007/QĐ-TTg dated 20/7/2007 of Prime Minister on the support policy to improve knowledge of Law enforcement within 135 program- stage 2.
- Decision No. 1956/2009/QĐ-TTg, dated 17/11/2009 of Prime Minister approving the Master Plan on career orientation training for rural labours to 2020.
- 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.

I. Some legal documents related to sub-project preparation

- Decision No. 2439 / QĐ-UBND-NN dated 03/06/2014 of Nghe An Province of allows up investment project to repair and upgrade reservoirs: Khe San, Hoc Nghet, Khe Gang - Quynh Luu; Xuan Duong, Tan Ky; La Nga, Thanh Chuong; Thanh Thuy, Nam Dan district, Nghe An province;
- Decision No. 557/QĐ.SNN-QLXD dated 09/06/2014 approving bidding plan for bidding package: Consulting on dam safety inspection for reservoirs of Nghe An province aiming to review reservoir safety (including Khe San reservoir)

J. National Regulations and Standards related to environmental protection

(i) Water Environment:

- QCVN 08:2008/BTNMT – National Technical Standard on surface water quality;
- QCVN 09:2008/BTNMT - National Technical Standard on ground water quality;
- QCVN 14:2008/BTNMT - National Technical Standard on domestic waste water.
- QCVN 39/2011/BTNMT - National Technical Standard on water quality for irrigation;

(ii) Air Environment:

- QCVN 05:2013/ BTNMT - National Technical Standard on around air quality;
- QCVN 06:2008/BTNMT – National Technical Standard on some toxics in around air.

(iii) Land Environment

- QCVN 03 : 2008/BTNMT - National Technical Standard on permitted limitation of heavy metals in the soil;
- QCVN 04 : 2008/BTNMT – National Technical Standard on residue of chemical and pesticide in the soil;
- QCVN 43:2012/BTNMT - National Technical Standard on sediment quality.

(iv) Solid waste management:

- QCVN 07: 2009/BTNMT - National Technical Standard on thresholds of hazardous waste.

(v) Vibration and noise:

- QCVN 26:2010/BTNMT – National Technical Standard on the noise;
- QCVN 27:2010/BTNMT – National Technical Standard on the vibration.

Appendix A4 – ACCOMPLISH SCREENING FORM

Table A4-1: Environmental and social impacts screening

Screening questions	Yes	No	Description of impact
1. Does the subproject have potential to cause significant adverse impacts on natural environment or important natural environment?			
- Causing loss or degradation to land and water areas where (i) there are native species, and (ii) human's activities have not caused any significantly changes on the fundamental ecological functions of the project area.		x	Sub-project withdraws land of 03 households and Communal People's Committee with area of 14,200 m ² for construction, repairmen, upgradation of dam, spillway and management-operation road. Affected plants include acacia, low quality timber, trunk diameter less than 5cm. The subproject does not affect native species.
- Causing loss or degradation to important natural habitat as reserve areas, areas protected by traditional local communities (eg, sacred forests), biodiversity; rare, vulnerable, migratory, or endangered species.		x	<p>- The repairmen and upgradation are only conducted around the focal area including available spillways, dams, culverts and management road. All of the above said works are located in hamlet no. 7, Quynh Thang commune, Quynh Luu district. This is the agricultural area and there is no areas with sensitive environment, such as preserved areas, protected areas by traditionally local communities.</p> <p>In addition, the auxiliary areas temporarily occupied for the aim of disposal sites, material yard, workers' camps, the construction site are arranged on a total area of about 1 hectare in hamlet no. 4A and hamlet no. 7 in Quynh Thang commune. These mostly are wastelands, exploited land and shrubs, grass, not the areas sensitive of environment.</p>
2 . Does the subproject have the potential to cause significant adverse impacts on physical cultural resources?			
Causing loss or degradation to the tangible cultural resources, architectural objects, and groups of architectural objects, characteristics, natural landscapes which are important of archaeology, palaeontology, history, architect, religion, aesthetics, or other cultural importance.		x	The project scope does not include the tangible cultural resources, architectural objects, groups of architectural objects, characteristics, natural landscapes which are important of archaeology, palaeontology, history, architect, religion, aesthetics, or other cultural importance in Quynh Thang commune. The nearest residential area is 200 meters from the work of hamlet 7, Quynh Thang commune.
Possibly lead to conflict with national law or international obligations under relevant treaties and agreements concerning international environment,		x	Khe San reservoir was built in 1980. The regional report on discovery of relics, and scientific assets is not available. The project is implemented completely following the framework of national legislation and international

Screening questions	Yes	No	Description of impact
including the World Heritage Convention of UNESCO or affect heritages beneficial for famous and important scientific tourism.			obligations under relevant treaties and agreements on international environment.
3. Is sub-project potential to cause significant adverse impacts on land and relevant natural resources due to being used by ethnic minorities			
Possibly to cause impacts on land or territory which are traditionally owned, or customarily used or occupied, and areas where the access to natural resources is extremely vital for the sustainability of the culture and livelihood of ethnic minorities. Potentially impact cultural and spiritual values symbolizing for those areas and natural resources or impact the management of natural resources and the long-term sustainability of affected resources.		x	<p>- As stated above, Hamlet 7 in Quynh Thang commune where items are upgraded and repaired under the scope of sub-projects is an agricultural area, the population is completely Kinh group. There are no land and relevant natural resources used by ethnic minorities. The withdrawn areas (, temporarily - 10,000m²) are wasteland, and public land (temporary withdrawal), and does not suffer the opposition by the people during the consultation, information disclosure.</p> <p>The project does not use the lands or territories which are traditionally owned, or customarily used or occupied.</p>
4. Is sub-project potential to cause significant adverse impacts on relocated population?			
Leading to the relocation of people or land and asset withdrawal, affecting their lives and difficulties in livelihood recovery.		x	Temporary land acquisition does not affect people because the area of land recovered is mainly shrubs and vegetation.
5. Is it necessary for a large dam to be constructed under the scope of the sub-project?			

Screening questions	Yes	No	Description of impact
<p>Is that necessary for a large dam to be constructed under the sub-project's scope?</p> <ul style="list-style-type: none"> - 10 meters high or above - 10 to 15 meters high, with complex design - Less than 10 meters high, but expected to become the largest dam during the operation phase of the sub-projects? 		x	<p>The height of Khe San reservoir is from 8 to 12 meters. Within the sub-project's scope, only repairmen and upgradation shall be conducted, but not to construct a large dam. A report on dam safety for the sub-project of repairmen and improvement for the safety of Khe San reservoir was made, ensuring the principles on safety for dam by the Government of Vietnam as well as policies by the World Bank.</p>
<p>Does the operation of the sub-project depend on the efficiency of:</p> <ul style="list-style-type: none"> - Existing or under construction dam - Power stations or water supply system taking water directly from the reservoir by a large dam or controlled by an under construction dam. - Diversion dam or hydraulic structures downstream from an existing dam or an under construction dam, where every incidents occurable to dam in riverhead can cause tremendous harms or damages to the architecture and irrigation projects or works of water supply funded by the World Bank, are the projects dependent on the capacity and performance of a existing large dam or an under-construction-dam to supply water and could not work if the dam is broken. 		x	<p>Sub-project is to improve the capacity and ensure the safety of the dam and the people living in downstream.</p> <p>During repairmen, upgradation, some items of dam, reservoir shall be repaired to improve their efficiency.</p> <p>Dam is constructed based on the current state only, does not increase the capacity or the irrigated area after being invested.</p>
6 . Whether the sub-project leads to pesticide purchase or use?			
Does the formula of products falls into classes IA and IB as classified by World Health Organization, or is there any products with formula classified into type II?		x	There is no activity under the sub-project related to pesticide purchase or use.
7. Is sub-projects potential to cause irreversible impacts or not easy to mitigated impacts?			
Leading to loss of regional recharge aquifers, affecting the quality of water storage and water storage areas responsible for providing drinking water to large population centers.		x	The construction and upgrading of items under the sub-project only concentrate on the focal area of Khe San reservoir, on a very small temporarily occupied area, will not impact on the quality of storage water and water storage areas. Land temporarily used for the construction includes the ground for construction, camp, site management office, the material

Screening questions	Yes	No	Description of impact
			<p>stockpile in the total area of about 1 hectare located along the management route on the wasterland.</p> <p>- Moreover, the majority of the population on the project area use rainwater, water from wells for the purposes of eating and daily activities, accounting for more than 90%, the nearest residential area is 200 meters from the construction site. Thus, the project is not likely to affect water storage to be supplied for residents' demand of drinking water</p>
Leading to any impact that affected period is relatively long, affected a large area or the impacts are great.		x	<p>The activities from construction and repairmen of Khe San reservoir do not take so long (about 10 months) and mainly conducted in the dry season, so the impact of irrigation water for 120 hectares of production land during this period is insignificant.</p> <p>The repaired reservoir will ensure the safety of the people behind the dam, at the same time provide a stable, effective water supply and gradually contribute to community economic development.</p>
8. Is the sub-project potential to lead to a wide variety of significant adverse impacts?			
Many construction site in different locations are affected; each impact causes the loss of habitat, natural resources, land or significant depletion to quality of resources.		x	<p>The construction area of the sub-project is not large. The influence on habitat, natural resources and soil is not significant.</p> <p>- Construction area: 0.1 hectare</p> <p>- Tent area: 0.05 hectare</p> <p>- Burrow pit: the reserve of 40,000-50,000m³</p> <p>- The disposal site: Located in the hamlet no. 7, Quynh Thang commune is a wasteland, low-lying terrain with disposal reserves of about 40,000m³</p> <p>- Area of material yard: 0.1 hectare (70% of waste materials will be used for levelling, so the needed area is very small. Besides, when the work is completed, this area will be reconstituted and the actual status of land use shall be returned as its original status.</p>

Screening questions	Yes	No	Description of impact
			- The construction takes place in a narrow area. There is no impact on the habitat, natural resources, land or significant depletion on quality of natural resources.
The significant and potential adverse effects are able to expand to the construction site or construction works.		x	<p>- The construction only uses 1 route from the main road to access the Communal People's Committee to the top of dam.</p> <p>- Dust generating and distributing outside the site may occur, but only in a narrow range. Besides, the construction is executed in rural area and plentiful of trees. So, smoke and dust are easily diluted. Combining with mitigation measures taken by the contractor, this impact can be entirely possible controlled.</p>
The impact beyond the border (in addition to a small change in the ongoing waterway activity).		x	Sub-projects are implemented entirely in the territory of Vietnam and does not impact across borders.
The necessity to build a service roads, tunnels, canals, power transmission corridors, new pipelines, or borrowed and disposed areas in the undeveloped region.		x	<p>- There is an item of management road upgradation from asphalt road (Provincial Road 598) to the pool area for the purpose of a better operation system and use in case of incidents.</p> <p>- Beginning point of the route starts from the main road passing the Communal People's Committee (Provincial Road 598) to the reservoir approximately 150 meters. This route will be used as temporary road during the dam construction. The materials shall be transported via this route. Currently, it is a soil road, after upgrading it becomes a concrete road with the length of 145,8 meters, lowering the slope ensures people's travelling.</p> <p>- Vegetation along the road is mostly bushes, only some common trees such as chinaberry, low quality timber. Those contribute low economic value, not rare plants.</p>
Interrupting the immigration cycle of wild creatures, herds of animals, or raisers, nomads or semi-nomads		x	- Sub-projects is conducted in hamlet no. 7 in Quynh Thang commune, Quynh Luu district where is densely populated. Wild animals have not been seen here. There are only animals such as buffalo, cows, etc., grazed by the households. The implementation of sub-project does not interrupt the immigration cycle of animals.

Screening questions	Yes	No	Description of impact
			- There is no nomads or semi-nomads in the project area.
9. Is the subproject not a precedent?			
National precedent is not available?		x	A lot of similar projects have been executed
Provincial precedent is not available?		x	There are three reservoirs in Nghe An province funded. Similar projects funded by the World Bank have been implemented in Nghi Loc District, Anh Son, Thai Hoa town.
10. Being a controversial sub-project and likely to attract the attention of NGOs and nationally and internationally social organizations?			
Being considered as risk and potentially containing specially controversial aspect		x	Being a sub-project of repairmen, the work came into a long-term operation, under the management of specific units and subjects to be served are clear. Therefore, there is no possibility for the especially controversial aspect.
Likely lead to protests by people those want to show-off themselves or stop construction.		x	Consultation results showed that both the government and people agree and support the sub-project 100%

Table A4-2: Environmental and social impacts need to be handled

No.	Does the sub-project cause these impacts on environment?	Impact level	Description of impact
1.	Violate historical / cultural regions	No impact	Within a radius of 5 kilometers (from the project area), there is no historical/cultural regions needed to be preserved. Sub-project environmental and social impacts screening
2.	Violate ecosystems (for example: sensitive natural habitat or reserve area, national parks, natural reserve areas ...).	No impact	Sub-project only renovates the current status, not to expand, does not violate of Natural reserve area.... Furthermore, within a radius of 20 kilometers from Khe San reservoir, there is no natural reserve area or sensitive natural habitat. Therefore, activities under the sub-project shall not violate the ecosystem.
3.	To cause deformation to the landscape and increase the amount of waste.	Low	<p>- During construction, the sub-project will permanently withdraw some certain areas. Specifically:</p> <p>- Sub-projects will permanently affect 14,200m² of land around Khe San reservoir and temporarily use approximately 10,000m² of land surrounding the project to build auxiliary areas, and workers' camps. There are 03 households affected.</p> <p>The effect is slight because:</p> <p>i) There are 01 households to be relocated but this problem has been included in the report on Resettlement Action Plan (RAP);</p> <p>ii) Permanently affected land are gardens, alluvial land, leased land of Communal People's Committee; livelihood of households is not much affected;</p> <p>(See the report on Resettlement Action Plan for more details)</p> <p>- Location: Focal area of Khe san reservoir, in Quynh Thang Commune</p> <p>- Time: Prior to implementation of the project</p> <p>• Waste emission: There are three sources of solid waste emitted from construction activities including: type (i) construction wastes such as debris from the surface leveling (plants, animal feces, fences, etc.), cement packs, oil tanks and engine oil, etc.; type (ii) daily wastes from workers' camps on the construction area; and (iii) residually excavated soil. In addition, the sludge from toilets can contain harmful bacteria and is the source of pollution that needs to be handled during the construction.</p> <p>- The aforesaid impacts are considered LOW and TEMPORARY due to:</p> <p>- With regard to type (i) and type (ii): those are non-hazardous solid wastes, particularly, residual materials (with a total estimated volume of 37,789m³) shall be collected and quickly stockpiled to the disposal site.</p>

No.	Does the sub-project cause these impacts on environment?	Impact level	Description of impact
			<p>- Wastes in type (ii): In the rush period, there will be about 50 people working on the construction site so the volume of generated waste is not much, approximately 15-30 kg / day (approximately 0.3- 0.5 kg / person / day).</p> <p>- The volume of solid waste generated during the construction can be easily managed in accordance with the regulations on solid waste management. Domestic wastes like latrine sludge will be handled in accordance with standard designed by the Ministry of Health, and the amount of sludge can be used for cultivation as a fertilizer for the soil.</p> <p>- Location: workers' camps and within 50 meters around the camps of workers</p> <p>Duration: 18 months.</p>
4.	To destroy the vegetation layer or to cut down trees.	Low	<p>- The sub-project is mainly based on the status of the former work. Permanent and temporary withdrawal forces to have around 9,000 Acacia and Melaleuca cut down; and is a wasteland along the reservoir under the management of the Communal People's Committee. There is no valuable vegetational cover demolished by the implementation of sub-projects.</p>
5.	Change in the quality of surface water or flow (eg, increase in turbidity due to wastewater from camps, erosion, and construction waste).	Low	<p>- At the rush period of construction, there may be 50 workers presenting on the site, the amount of generated wastewater is 1,800 liters / day (60 liters/day/person). Domestic wastewater flowing into the water resource shall be the risk to increase the amount of pollutants in the water.</p> <p>- About 10 vehicles and machines of all kinds regularly travel on site. Oil spills from construction machines and equipment or water during machine washing may cause pollution and decrease the water quality and aquatic ecosystems.</p> <p>- Waste water and oil compounds may be sunk into the soil and will gradually seep into aquifer and contaminate aquifer.</p> <p>- In addition, wastewater from toilets of workers' camps in case the measures are not properly applied can also change the quality of water quality in surrounding areas.</p> <p>- However, this effect is SLIGHT and TEMPORARY due to:</p> <p>+ The location of camps - a place to keep grease away from water source (from 2 kilometers)</p> <p>+ With the amount of waste water is 1,800 liters /day, the average concentration of suspended solids in wastewater after being discharged into streams is very small, can be controlled by the mitigation measures</p>

No.	Does the sub-project cause these impacts on environment?	Impact level	Description of impact
			<p>+ Sub-project will be conducted in the dry season when rainfall is lowest, therefore, the possibility of washed oil, grease or compounds which are washed and swept to downstream is very low.</p> <p>+ Wastes from petroleum products can easily be stored in a safe place such as the standard containers (ie containers with lids), and the contractor shall collect and dispose hazardous waste at right places.</p> <p>+ Location: dams, spillways, channels and machinery oil storages in downstream of the dam</p> <p>+ Duration: 18 months of construction</p>
6.	Increase the dust volume or contaminants into the air during the construction.	Low	<p>During repair of dams, spillways, bridges and auxiliary works, some of the activities described below will cause negative impacts such as dust emission, exhaust gas causing bad effects on lives of local residents:</p> <ul style="list-style-type: none"> - The operation of equipment and trucks on the location crossing residential areas of hamlets no. 7 and 9, in Dong Xuan hamlet, Quynh Thang commune. - Material and waste transportation for construction via the public soil routes crossing hamlets no. 2, 3, 11, 6, 7, 9. - Everyday, there is about 5 trucks (10 tons) travelling on the route during the construction roads (total of 14,138 turns - equivalent to 141,377 tons of excavated soil) <p>The amount of dust and gas can cause respiratory diseases or lung diseases to people (such as sinusitis, asthma, etc) if people directly contact with these polluted sources in a long period.</p> <p>However, this effect is SLIGHT and TEMPORARY due to:</p> <ul style="list-style-type: none"> i) The construction site of the sub-project (dam and auxiliary works) takes place in rural area where is thinly populated and airy. Dust can easily be diluted in the air and swept by the wind. ii) Location of sub-project (dam and auxiliary works) is mainly in hamlet 4A, in Quynh Thang commune. This is thinly populated area. Only a few families live nearby the construction site. iii) The number of vehicles / equipment for construction, especially noisy vehicles/ equipment is not much; about 5 turns of trucks passing residential areas but will not generate a large amount of emissions. <p>Location: Transportation route passing hamlets no. 3, 11, 6, 7, 9 of Quynh Thang commune with a length of about 18 kilometers. Construction site is located in hamlet no. 7, in Quynh Thang commune.</p>

No.	Does the sub-project cause these impacts on environment?	Impact level	Description of impact
			Duration: 18 months of construction (in 2 dry seasons)
7.	Increasing noise and vibration	Low	<p>Noise can be caused by vehicles transporting materials for construction and construction equipment (excavators, bulldozers, road rollers, compactors) affecting families and schools along segment of the construction route. Every day during the construction, there is about 15,857 time trucks. The construction time is 18 months, there will be 1,321 vehicles/month. During the construction and transportation of materials and wastes, noise will be generated and can affect people living along the route on Khe San reservoir. However, these effects are SLIGHT and TEMPORARY due to:</p> <p>i) The sub-project area is quite open, airy with lots of plants and crops which can reduce noise.</p> <p>ii) The residential area located near the route and construction works are distributed fairly sparse, with a low population density (215 people / km²).</p> <p>iii) The number of equipment / means for construction causing noise is not significant (about 36 trucks / day).</p> <p>Location: The transportation route passing hamlets no., 6, 7, and 5 of Quynh Thang commune</p> <p>Duration: 24 months of construction (in 2 dry seasons)</p>
8.	Resettling households? If yes, how many households to be resettled?	No impact	The area of temporarily acquired land is 10,000 m ² which is managed by the commune for construction purposes. According to the impact of land acquisition, none of the cases are relocated, no shops/businesses are affected and no ethnic minority households are affected by the subproject.
9.	Using environmentally and/ or culturally sensitive relocation area.	No impact	There is no household to be relocated. The sub-project temporarily withdraws a certain area for construction.
10.	The risk of disease transmission from workers to local residents (and vice versa).	Low	<p>- The temporary presence of workers living in households or their living in camps and interaction with local residents can cause infectious diseases among workers with local residents and vice versa.</p> <p>- During the construction, the use of water which does not meet standards of sanitary for workers in the camps or construction site may also cause gastrointestinal diseases or the spread of insect-transmitted disease (ie, dengue fever, malaria, etc). When immigrated labour are bitten by infected insects (mosquitoes) and then spread to others. Besides, a number of social diseases such as HIV / AIDS, syphilis ... are also potential to break out.</p>

No.	Does the sub-project cause these impacts on environment?	Impact level	Description of impact
			<p>- However, these effects are SLIGHT and TEMPORARY due to: a) large terrain and dust easily dispersed in the wind; b) toilets are designed following standards by Ministry of Health; c) controlling the spread of pathogenic insects as well as propagation on how to prevent pathogenic insects from workers; d) The Contractor regularly hold health checks to employees during the recruitment process; e) local government and communal medical stations shall launch propaganda activities when there are signs of infectious disease in the province.</p> <p>- Location: Quynh Thang commune</p> <p>- Time: The effects will last for a long time of the project implementation; dust and smoke will have strong influence on dry days while insects grow in rainy season.</p>
11.	Potential conflicts between workers and local residents (and vice versa).	Low	<p>During the construction, approximately 20-30 workers from other regions come to live and work on this area (in rush period there can be up to 50 employees). During this time, there may be conflicts between the local residents and immigrated labour due to disagreements on the culture or communication or disputes about employment opportunities. However, these effects are SLIGHT and TEMPORARY due to:</p> <p>i) Under the regulations by the State, the contractors have to report temporary residence, temporary absence to authorities of Quynh Thang commune about all workers who come to live and work on this area during the project implementation;</p> <p>ii) Immigrated workers shall be informed, instructed on communication and provided with contact information of local authorities and residents by the contractors. In addition, contractors also have their own regulations on the staff management.</p> <p>iii) The number of workers (about 30%) will be locally hired to perform simple tasks such as soil excavation, luminescence, and material transportation.</p> <p>Location: Quynh Thang commune. Duration: 18 months (in dry season)</p>
12.	Use of explosives or toxic chemicals	No impact	Explosives or toxic chemicals are not allowed to be used during construction.
13.	Using the site where accidents due to blasting or explosives remaining from the wartime occurred	No impact	Based on the results of the public consultation held on January 2015, there is no report within recent 20 years on bombs remained on the area of the sub-project.
14.	Construction may disrupt transportation, roads, or waterway.	Low	Construction may impact travelling, and transportation of the local residents, as well as the risk of accidents: a) increase the risk of accidents due to the increase of

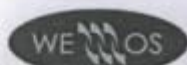
No.	Does the sub-project cause these impacts on environment?	Impact level	Description of impact
			<p>means travelling on inter-communal roads and construction area (where activities such as excavation and concentration of construction equipment and waste is located on or next to roads, works, etc) can be dangerous, especially at night when vision is limited; and suspended dust particles reduce the vision; b) the construction of dams and auxiliary works such as management road will limit travelling of people as well as the access to social infrastructures such as schools, markets, etc.</p> <p>However, these effects is SLIGHT and TEMPORARY due to:</p> <p>i) The route for construction material transportation within the sub-project and the site for dam construction and management road passing a few sparsely populated areas, so the possibility of traffic accidents is very low;</p> <p>ii) The number of vehicles / equipment for route construction with about 5 trucks / day is relatively little.</p> <p>iii) A part under the scope of work executed by the contractors is to ensure the health and safety on construction site for individuals and construction area. The risks to the safety of people are not allowed. Thus, the contractors shall take measures to minimize the impacts during the construction.</p> <p>iv) The route for construction material transportation does not pass the Communal People's Committee and schools. Hence, the access of people to these locations is not affected.</p> <p>Location: Quynh Thang commune</p> <p>Duration: 18 months of construction (in dry season)</p>
15.	Construction may cause any damages to existing roads, bridges or other rural infrastructure?	Low	<p>The process of transporting construction materials or wastes on rural roads can damage the road if these trucks are overcharged and operate in rainy and stormy weather.</p> <p>Other works of rural infrastructures such as power cable system, communication cables are not affected by the construction of the sub-project as they are located on the safety corridors of the main roads. The management road does not include works concerning power cables or communication cables. Other social infrastructures (schools, markets, etc) are located far away from the works of the sub-project. Thus, these social infrastructures are not affected by the construction.</p> <p>The above impacts are SLIGHT and TEMPORARY due to:</p> <p>i) Most of the works are constructed in the dry season, so the material transportation by trucks has a slight impacts on the quality of the road;</p>

No.	Does the sub-project cause these impacts on environment?	Impact level	Description of impact
			<p>ii) The quantity of construction materials and the number of vehicles transporting materials is low (about 5 trucks / day).</p> <p>Location: Quynh Thang commune</p> <p>Duration: 18 months of construction (in one dry season)</p>
16.	Excavation during construction of the sub-project can cause soil erosion.	Low	<p>Construction of dam roof, building water intakes, exploiting soil from mines (about 500 meters from the management road) can cause erosion to the dam or surrounding areas. However, these effects are SLIGHT and TEMPORARY due to:</p> <p>i) The construction of water intakes is carried out in dry season and surrounding dikes are also built. Thus, during the construction, the potentiality of soil erosion is very low or hardly occurs;</p> <p>ii) The dam roofs are constructed in dry season. The construction sites are located over the water level and the foot is made of cement; so the potentiality of erosion is low.</p> <p>Location: The focal work of Khe San reservoir, soil mine</p> <p>Duration: 18 months of construction (in 02 dry seasons)</p>
17.	Is it necessary for a new temporary and permanent service road to be opened?	No impact	<p>A new service road is not necessary to be opened. Temporarily, the existing routes are capable to transport construction materials and wastes.</p> <p>The subproject only upgraded the management route.</p>
18.	Separate or dissolve into the habitat of animals and plants?	No impact	<p>+ For the flora and fauna under the reservoir will not be affected since the project does not cause impacts on quality of water or water level.</p> <p>+ For terrestrial flora: Surrounding the sub-project and indirectly affected areas, none of them is the habitat of rare plants and animals which need to be preserved.</p>
19.	Long-term effects on quality of the air.	No impact	<p>The sources of air pollution mainly are from dust generated by means of transporting construction materials, wastes, etc, travelling on the roads in Quynh Thang commune. In addition, the air may also be polluted from the construction machines, and transportation means. However, this source of emission is very low and only occurs in certain time. Therefore, there is no long-term impact on quality of air, but some temporary impacts on the air.</p>

No.	Does the sub-project cause these impacts on environment?	Impact level	Description of impact
20.	The risk of accidents to workers and communities during construction period.	Medium	<p>Construction can face risks of accidents due to machine operation, excavation and filling, levelling or material transportation if workers fail to comply with regulations on safety at work. In addition, the construction can also cause accidents for communities if there is no restriction to the people's access to the construction site.</p> <p>However, these effects are at MEDIUM level and TEMPORARY due to:</p> <p>i) The number of construction machines is not much</p> <p>ii) A lot of items shall be manually constructed such as transporting materials, casting concrete, etc. Thus, risks of accidents will be significantly reduced;</p> <p>iii) The construction activities are mainly conducted in dry season, thus accidents are limited;</p> <p>iv) The construction sites are located far away from residential areas.</p> <p>Location: Along the route of transporting materials and waste</p> <p>Duration: 18 months (in 02 dry seasons).</p>
21.	Use of hazardous or dangerous materials and creation of hazardous wastes	No impact	Hazardous substances are not used and created within the scope of the sub-project.
22.	Risks for human's safety and health	Low	The construction can cause accidents for communities if there is no restriction on the access to the construction site of people. In addition, wastes during the construction can also cause negative effects on health of local residents if those are not properly treated.
23.	To affect the domestic and production water supply during construction of work items	Low	<p>The upgradation is carried out based on the current status and does not make change to the flow. The water supply for lower stream is not affected as the construction of culverts shall be conducted in dry season (This is the phase of drying and loosening soil on the field. Thus, there is no need to supply water for irrigation). Consequently, the production is not affected.</p> <p>On the other hand, the sub-project shall focus on items in terms of water intakes to shorten the construction time – during this time water supply shall be interrupted.</p> <p>Local residents shall be informed about the schedule of water supply/ water block 2 weeks beforehand since the commencement date so that they can have suitable plan for production.</p> <p>Location: Khe San reservoir</p> <p>Time: 18 months</p>
24.	Increase flooding, sediment transportation in downstream	Low	Khe San is an independent reservoir. Its downstream is the irrigated zones. The construction will require discharging water to the death water level in some

No.	Does the sub-project cause these impacts on environment?	Impact level	Description of impact
			certain times. The discharge may cause flooding in some areas of agricultural land. However, those are areas where the drainage system is good, these impacts is considered SLIGHT and TEMPORARY.
25.	Withdrawal (temporary or permanent) of public land (public or private) for construction.	Low	Under the scope of the project, there is 14,200m ² for perennial planting (in which there is 2,000m ² of gardening land and building land owned by Mr. Pham Ngoc Gia's household) to be permanently affected, 10,000m ² public land to be temporarily affected. The affected areas were calculated to be included into the provincial compensation and resettlement action plan.
26.	Using land currently occupied or regularly used for production purposes (eg, gardening, farming, grazing, fishing ground, forest).	Low	Within the scope of the project, there is 12,200m ² of agricultural land (reclaimed land) to be permanently affected. The affected areas have been calculated to be included in the provincial compensation plan.
27.	Relocation of individuals, families, or businesses.	No impact	Within the scope of the project, there is no affected household to be relocated or resettled from building land.
28.	Temporary or permanent loss of crops, fruit trees, houses or infrastructures.	No impact	In the project area, only indigo (over 70%), eucalyptus, acacia (9,000 trees) ... no fruit trees, or crops. Besides, there is no permanent house in the project area. The area of temporarily acquired land is 10,000 m ² which is managed by the commune for construction purposes. According to the impact of land acquisition, No households are affected over 20% of the total agricultural land area (or over 10% for vulnerable households), none of the cases are relocated, no shops/businesses are affected and no ethnic minority households are affected by the subproject.
29.	Mandatory restriction to the access of people in the reserve parks and reserve areas.	No impact	No reserve parks or natural reserve areas or national forests in the project area.
30.	The ethnic minority groups living within or nearby the subproject.	No impact	There is not ethnic minority living in the project area.
31.	Members of ethnic minority groups in the area are likely to be benefited or harmed by the project.	No impact	There is not ethnic minority living in the project area.
32.	Related to construction of a large dam?	No impact	The dam under Khe San reservoir is from 8 to 12 meters high. Thus, it is not the large dam as defined by World Bank.
33.	Depending on water supplied by an existing dam or weir or under-construction-dam?	No impact	Khe San reservoir neither depends on the water supplied by other reservoir nor supplies water for other reservoirs outside the rice field in its lower stream.

Apendix A5 - RESULT OF ENVIRONMENT SAMPLE ANALYSIS



VIMCERT 025
ISO 9001:2008

TRẠM QUAN TRẮC VÀ PHÂN TÍCH MÔI TRƯỜNG LAO ĐỘNG

Địa chỉ: 99 Trần Quốc Toàn, Hoàn Kiếm, Hà Nội
Điện thoại: 04-22172480; 04-22172473 Fax: 04-38223011



Số: 15/TBKQ-GS/195-L

Hà Nội, ngày 25 tháng 05 năm 2015

THÔNG BÁO KẾT QUẢ

1	Địa điểm lấy mẫu:	DỰ ÁN HỒ KHE SẴN		
2	Địa chỉ:	Xã Quỳnh Thắng, Huyện Quỳnh Lưu, Nghệ An		
3	Ngày lấy mẫu :	27/02/2015		
4	Điều kiện thời tiết:	Nắng		
5	Cán bộ tham gia lấy mẫu			
	CN. Bùi Sỹ Hoàng	CN.Trần Phương Thảo		
6	Cán bộ tham gia thực hiện:			
	ThS. Trần Thị Liễu	ThS. Đặng Thị Thu Hà	ThS. Vũ Thanh Phương	
	ThS. Tạ Thị Trang Nhâm	CN. Trần Ngọc Thanh	KS. Vũ Duy Thanh	
	CN. Bùi Sỹ Hoàng	CN.Trần Phương Thảo	KS. Lê Anh Thư	

A. Thông số, phương pháp thử nghiệm và thiết bị sử dụng chính

Bảng 1: Thông số, phương pháp thử nghiệm và thiết bị sử dụng chính

TT	Thông số	Phương pháp thử	Thiết bị sử dụng chính
I. Môi trường không khí			
1	Vi khí hậu	QCVN 46:2012/BTNMT	Testo 425&645
2	Tiếng ồn	TCVN 7878-2:2010	Sound pro DLX, Quest
3	Độ rung	TCVN 6963 : 2001	VM-82, Rion
4	Bụi tổng số	TCVN 5067:1995	Cân AE 240, Mettler
5	CO	SOP-PT-32	Lambda 25, Perkin Elmer
6	SO ₂	TCVN 5971:1995	Lambda 25, Perkin Elmer
7	NO ₂	TCVN 6137:2009	Lambda 25, Perkin Elmer
II. Môi trường nước mặt			
1	Nhiệt độ	SWEWW 550B: 2012	Nhiệt kế bách phân
2	Độ đục	SMEWW 2130 B	Model 2100P, HACH

1. Kết quả này chỉ có giá trị trên mẫu thử nghiệm.

2. Thông số đánh dấu (*) chưa được công nhận Vilas, thông số in nghiêng được thực hiện bởi nhà thầu phụ

3. Nghiêm cấm sao chép dưới mọi hình thức nếu chưa có được sự đồng ý của Wemos.

BM 17.05

Lần ban hành: 02.2013

1/8

3	pH	TCVN 6492:2011	Sension 156 của Hach
4	EC	SMEWW 2540 C	Sension 3, Hãng HACH
5	DO	TCVN 7325:2004	Sension TM 156 của Hach
6	TSS	TCVN 6625:2000	Cân AE 240, Mettler
7	TDS	SMEWW 2540 C	Sension 3, Hãng HACH
8	COD	SWEWW 5220C: 2012	Titration
9	BOD ₅	TCVN 6001-1: 2008	BOD Foc 225 E, Hãng Foc
10	NO ₂ ⁻	TCVN 6178: 1996	Lambda 25, Perkinelmer
11	NO ₃ ⁻	TCVN 6180: 1996	Lambda 25, Perkinelmer
12	NH ₄ ⁺	TCVN 6179-1:1996	Lambda 25, Perkin Elmer
13	PO ₄ ³⁻	TCVN 6202-2008	Lambda 25, Perkinelmer
14	SO ₄ ²⁻	TCVN 6200: 1996	Lambda 25, Perkinelmer
15	Cl ⁻	TCVN 6194:1996	Lambda 25, Perkinelmer
16	Fe	SMEWW 3111B:2012	AAS 400, Perkinelmer
17	As	TCVN 6626:2000	ASS 600, Perkinelmer
18	Pb	TCVN 6193 - 1996	ASS 600, Perkinelmer
19	Cd	TCVN 6197 - 1996	ASS 600, Perkinelmer
20	Coliform	TCVN 6187-2:2009	Memmert INB500
21	Clostridium perfringens	ISO 14189:2013	Memmert INB500

III. Môi trường nước dưới đất

1	Nhiệt độ	SWEWW 550B: 2012	Nhiệt kế bách phân
2	Độ đục	SMEWW 2130 B	Model 2100P, HACH
3	pH	TCVN 6492:2011	Sension 156 của Hach
4	Độ dẫn điện EC	SWEWW 2520B: 2012	Sension 156 của Hach
5	Độ cứng CaCO ₃	TCVN 6224 - 1996	Titrimetric
6	SS	TCVN 6625:2000	Cân AE 240, Mettler
7	TDS	SMEWW 2540 C	Sension 3, Hãng HACH
8	DO	TCVN 7325:2004	Sension TM 156 của Hach
9	COD	TCVN 6186:1996	Titration
10	NO ₂ ⁻	TCVN 6178: 1996	Lambda 25, Perkinelmer
11	NO ₃ ⁻	TCVN 6180: 1996	Lambda 25, Perkinelmer

1. Kết quả này chỉ có giá trị trên mẫu thử nghiệm.

2. Thông số đánh dấu (*) chưa được công nhận Vilas, thông số in nghiêng được thực hiện bởi nhà thầu phụ

3. Nghiêm cấm sao chép dưới mọi hình thức nếu chưa có được sự đồng ý của Wemos.

12	NH ₄ ⁺	TCVN 6179-1:1996	Lambda 25,Perkin Elmer
13	PO ₄ ³⁻	TCVN 6202-2008	Lambda 25,Perkinelmer
14	SO ₄ ²⁻	TCVN 6200 - 1996	Lambda 25,Perkinelmer
15	Cl ⁻	TCVN 6194:1996	Lambda 25,Perkinelmer
16	Fe	SWEWW 3111B: 2012	AAS 400, Perkin Elmer
17	As	TCVN 6626:2000	ASS 600, Perkinelmer
18	Pb	TCVN 6193 - 1996	ASS 600, Perkinelmer
19	Cd	TCVN 6197 - 1996	ASS 600, Perkinelmer
20	Clostridium perfringens	ISO 14189:2013	Memmert INB500
21	Coliform	TCVN 6187-2:2009	Memmert INB500
22	E.coli	TCVN 6187-1:2009	Memmert INB500
IV. Môi trường đất và trầm tích			
1	pH _{H2O}	TCVN 5979:2007	Sension156 của Hach
2	pH _{KCl}	TCVN 5979:2007	Sension156 của Hach
3	Mùn tổng	Phương pháp Walkley - Black	Titrimetric
4	Thành phần cơ giới	TCVN 5257:1990	Ống hút Robinson
5	N tổng số	TCVN 4051:1985	Titrimetric
6	P tổng số	TCVN 4052:1985	Titrimetric
7	K tổng số	TCVN 4053:1985	Titrimetric
8	N dễ tiêu	TCVN 5255:2009	Titrimetric
9	P dễ tiêu	TCVN 5256:1990	Titrimetric
10	K dễ tiêu	TCVN 5254:1990	Titrimetric
11	Fe	TCVN 8246:2009	AAS 400, Perkinel mer
12	Al ³⁺	TCVN 8246:2009	AAS 400, Perkinel mer
13	Ca	TCVN 4405:1987	Titrimetric
14	Mg	TCVN 4406:1987	Titrimetric
15	As	TCVN 8467:2000	AAS 600, Perkinel mer
16	Cd	TCVN 6649:2000 &TCVN 6496:2009	AAS 400&600, Perkinel mer
17	Pb		
18	Cu		
19	Zn		

1. Kết quả này chỉ có giá trị trên mẫu thử nghiệm.

2. Thông số đánh dấu (*) chưa được công nhận Vilas, thông số in nghiêng được thực hiện bởi nhà thầu phụ.

3. Nghiệm cầm sao chép dưới mọi hình thức nếu chưa có được sự đồng ý của Wemos.

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B. Kết quả quan trắc môi trường:

I. Không khí xung quanh

I.1. Yếu tố vật lý

Bảng 2: Kết quả quan trắc hiện trường yếu tố vật lý

TT	Vị trí quan trắc	Tiếng ồn (dBA)	Nhiệt độ (°C)	Độ ẩm (%)	Tốc độ gió (m/s)	Độ rung [*] (dB)
1	Vị trí K1	42,2	18,8	68,1	0,9-1,7	35
2	Vị trí K2	44,6	18,6	66,5	0,6-1,0	40
3	Vị trí K3	47,3	18,9	66,1	0,5-0,8	47
4	Vị trí K4	50,3	18,3	73,5	0,7-1,5	43
QCVN 26:2012/BTNMT (từ 6 giờ đến 21 giờ)		70	-	-	-	-
QCVN 27:2010/BTNMT (từ 6 giờ đến 21 giờ)		-	-	-	-	75

Ghi chú: + Tọa độ K1 (N:19°15'51,4" &E: 105°33'54,5") : Phía nam đập

+ Tọa độ K2 (N:19°15'42,8" &E: 105°33'58,3") : Phía bắc đập

+ Tọa độ K3 (N:19°15'47,0" &E: 105°34'01,5") : Khu vực giáp đường

+ Tọa độ K4 (N:19°15'46,7" &E: 105°34'01,8") : Kênh dẫn nước sau đập

I.2. Thông số hóa học:

Bảng 3: Kết quả phân tích các thông số hóa học

TT	Vị trí quan trắc	Bụi	SO ₂ [*]	NO ₂ [*]	CO [*]
		(µg/m ³)			
1	Vị trí K1	103	60	33	<5.000
2	Vị trí K2	116	58	30	<5.000
3	Vị trí K3	172	63	35	<5.000
4	Vị trí K4	153	62	33	<5.000
QCVN 05:2013/BTNMT		300	250	200	30.000

Ghi chú: + Tọa độ K1 (N:19°15'51,4" &E: 105°33'54,5") : Phía nam đập

+ Tọa độ K2 (N:19°15'42,8" &E: 105°33'58,3") : Phía bắc đập

+ Tọa độ K3 (N:19°15'47,0" &E: 105°34'01,5") : Khu vực giáp đường

+ Tọa độ K4 (N:19°15'46,7" &E: 105°34'01,8") : Kênh dẫn nước sau đập

II. Môi trường nước

2.1. Nước mặt

Bảng 4: Kết quả quan trắc nước mặt

TT	Thông số	Đơn vị	Kết quả			QCVN 08:2008/
			NM1	NM2	NM3	

1. Kết quả này chỉ có giá trị trên mẫu thử nghiệm.

2. Thông số đánh dấu (*) chưa được công nhận Vilas, thông số in nghiêng được thực hiện bởi nhà thầu phụ

3. Nghiệm cầm sao chép dưới mọi hình thức nếu chưa có được sự đồng ý của Wemos.

						BTNMT (B1)
1	Nhiệt độ	oC	21,2	22,7	24,3	-
2	Độ đục*	NTU	1,54	2,16	1,08	-
3	pH	-	6,92	6,99	6,95	5,5-9
4	EC	μS/cm	135,0	143,8	152,8	-
5	DO	mg/L	4,23	4,36	5,01	≥4
6	SS	mg/L	24	34	37	50
7	TDS	mg/L	86,4	92,0	97,8	-
8	COD	mg/L	11,3	17,5	12,3	50
9	BOD ₅	mg/L	3,8	5,2	3,8	15
10	NO ₂	mg/L	<0,01	<0,01	<0,01	0,04
11	NO ₃ ⁻	mg/L	2,98	3,13	4,06	10
12	NH ₄ ⁺	mg/L	<0,06	<0,06	0,07	0,5
13	PO ₄ ³⁻	mg/L	<0,05	<0,05	<0,05	0,3
14	SO ₄ ²⁻	mg/L	<5	<5	<5	-
15	Cl ⁻	mg/L	25	29	36	600
16	Fe	mg/L	0,107	0,091	0,118	1,5
17	As	mg/L	<0,0016	<0,0016	<0,0016	0,05
18	Pb	mg/L	<0,0016	<0,0016	<0,0016	0,05
19	Cd	mg/L	<0,0008	0,0010	0,0012	0,01
20	Coliform	MPN/100ml	6.400	5.900	7.300	7.500
21	<i>Clostridium perfringens</i>	MPN/100ml	KPH	KPH	KPH	-

Ghi chú: + Tọa độ NM1 (N:19°15'50,5" &E: 105°33'54,5") : Phía nam đập

+ Tọa độ NM2 (N:19°15'43,7" &E: 105°33'57,1") : Phía bắc đập

+ Tọa độ NM3 (N:19°15'46,7" &E: 105°34'01,8") : Kênh dẫn nước sau đập

2.2. Nước dưới đất

Bảng 5: Kết quả quan trắc nước dưới đất

TT	Thông số	Đơn vị	Kết quả		QCVN 09:2009/ BTNMT
			NN1	NN2	
1	Nhiệt độ	oC	20,7	21,8	-
2	Độ đục*	NTU	0,82	0,60	-
3	pH	-	6,30	6,22	5,5-8
4	Độ dẫn điện EC	μS/cm	225,1	43,3	-
5	Độ cứng CaCO ₃ *	mg/L	62	18	500

1. Kết quả này chỉ có giá trị trên mẫu thử nghiệm.

2. Thông số đánh dấu (*) chưa được công nhận Vilas, thông số in nghiêng được thực hiện bởi nhà thầu phụ

3. Nghiệm cầm sao chép dưới mọi hình thức nếu chưa có được sự đồng ý của Wemos.

TT	Thông số	Đơn vị	Kết quả		QCVN 09:2009/ BTNMT
			NN1	NN2	
6	SS	mg/L	<2	<2	-
7	TDS	mg/L	141,4	27,7	-
8	DO	mg/L	2,08	1,75	-
9	COD	mg/L	<0,4	<0,4	4
10	NO ₂ ⁻	mg/L	<0,01	<0,01	1,0
11	NO ₃ ⁻	mg/L	1,13	0,84	15
12	NH ₄ ⁺ -N	mg/L	<0,06	<0,06	0,1
13	PO ₄ ³⁻	mg/L	<0,05	<0,05	-
14	SO ₄ ²⁻	mg/L	<5	<5	400
15	Cl ⁻	mg/L	23	17	250
16	Fe	mg/L	<0,035	<0,035	5
17	As	mg/L	<0,0016	<0,0016	0,05
18	Pb	mg/L	<0,0016	<0,0016	0,01
19	Cd	mg/L	<0,0008	<0,0008	0,005
20	Coliform	MPN/100 ml	KPH	KPH	KPH
21	E.coli	MPN/100 ml	KPH	KPH	KPH
22	<i>Clostridium perfringens</i>	MPN/100 ml	KPH	KPH	-

Ghi chú: + Tọa độ NN1 (N:19°15'47,6" & E: 105°34'01,0")-Hộ Hồ Thị Hồng
+ Tọa độ NN2 (N:19°15'57,6" & E: 105°33'59,6")- Hộ Trần Đức Thủy

III. Môi trường đất,

Bảng 6: Kết quả phân tích đất

TT	Thông số	Đơn vị	Kết quả	QCVN 03:2008/ BTNMT (Đất nông nghiệp)
			MĐ1	
1	pH _{H2O}	-	7,13	-
2	pH _{KCl}	-	7,54	-
3	Mùn tổng số	%	1,6	-
4	N tổng số	%	0,11	-
5	P tổng số	%	0,07	-
6	K tổng số	%	0,05	-
7	N dễ tiêu	mg/100g	6,3	-
8	P dễ tiêu	mg/100g	10,8	-

- Kết quả này chỉ có giá trị trên mẫu thử nghiệm.
- Thông số đánh dấu (*) chưa được công nhận Vilas, thông số in nghiêng được thực hiện bởi nhà thầu phụ.
- Nghiêm cấm sao chép dưới mọi hình thức nếu chưa có được sự đồng ý của Wemos.

9	K dễ tiêu	mg/100g	11,3	-
10	Thành phần cơ giới			
	Cát (0,5-1mm)	%	18,43	-
	Limon (0,002-0,5mm)	%	31,10	-
	Sét (<0,002mm)	%	50,47	-
11	Ca	mg/Kg	173,2	-
12	Mg	mg/Kg	113,1	-
13	As	mg/Kg	0,72	12
14	Cd*	mg/ Kg	<0,89	2
15	Cu*	mg/ Kg	14,18	50
16	Pb*	mg/ Kg	9,24	70

Ghi chú: + Tọa độ MD1 (N:19°15'51,4" & E: 105°33'54,5") : Phía nam đập

Bảng 7: Kết quả phân tích trầm tích

TT	Thông số	Đơn vị	Kết quả	QCVN 43:2012/BTNMT
			MTT1	
1	pH _{H2O}	-	6,23	-
2	pH _{KCl}	-	6,81	-
3	Mùn tổng	%	8,54	-
4	Thành phần cơ giới			-
	Cát (0,5-1mm)	%	10,34	-
	Limon (0,002-0,5mm)	%	53,68	-
	Sét (<0,002mm)	%	35,98	-
5	N tổng số	%	0,31	-
6	P tổng số	%	0,18	-
7	K tổng số	%	1,14	-
8	N dễ tiêu	mg/100g	11,63	-
9	P dễ tiêu	mg/100g	13,83	-
10	K dễ tiêu	mg/100g	19,04	-
11	Fe	mg/Kg	102,15	-
12	Al ³⁺	mg/Kg	28,41	-
13	Ca	mg/Kg	41,32	-

1. Kết quả này chỉ có giá trị trên mẫu thử nghiệm.

2. Thông số đánh dấu (*) chưa được công nhận Vlas, thông số in nghiêng được thực hiện bởi nhà thầu phụ

3. Nghiêm cấm sao chép dưới mọi hình thức nếu chưa có được sự đồng ý của Wemos.

14	Mg	mg/Kg	22,43	-
15	As	mg/Kg	0,99	17,0
16	Cd*	mg/Kg	<0,89	3,5
17	Pb*	mg/ Kg	<0,89	91,3
18	Cu*	mg/ Kg	6,24	197
19	Zn*	mg/ Kg	10,12	315

Ghi chú:

Tọa độ MTT1 (N:19°15'46,7" &E: 105°34'01,8"): Mẫu trầm tích kênh dẫn nước

IV. NHẬN XÉT :

Theo số liệu quan trắc và phân tích môi trường nước tại dự án hồ Khe Sân có nhận xét như sau :

1. Môi trường không khí xung quanh:

+ Theo bảng 2: Tiếng ồn được quan trắc có giá trị nằm trong giới hạn cho phép của quy chuẩn QCVN 26:2010/BTNMT.

+ Theo bảng 3: Bụi và các thông số hóa học tại các vị trí được quan trắc có giá trị nằm trong giới hạn cho phép của quy chuẩn QCVN 05:2013/BTNMT.

2. Môi trường nước

+ Theo bảng 4: Trong mẫu nước mặt, các thông số được quan trắc có giá trị nằm trong giới hạn cho phép của quy chuẩn QCVN 08:2008/BTNMT (B1)

+ Theo bảng 5: Trong mẫu nước ngầm, các thông số được quan trắc có giá trị nằm trong giới hạn cho phép của quy chuẩn QCVN 09:2009/BTNMT

3. Môi trường đất và trầm tích:

+ Theo bảng 6: Các thông số được quan trắc trong các mẫu đất có giá trị nằm trong giới hạn cho phép của quy chuẩn QCVN 03:2008/BTNMT.

+ Theo bảng 7: Các thông số được quan trắc trong các mẫu trầm tích có giá trị nằm trong giới hạn cho phép của quy chuẩn QCVN 43:2012/BTNMT.

TRẠM QUAN TRẮC VÀ PHÂN TÍCH MÔI TRƯỜNG LAO ĐỘNG



PHÓ GIÁM ĐỐC

Ths. Vũ Thanh Lương

PHÒNG GIÁM SÁT & PHÂN TÍCH MÔI TRƯỜNG



ThS. Đặng Thị Thu Hà

1. Kết quả này chỉ có giá trị trên mẫu thử nghiệm.
2. Thông số đánh dấu (*) chưa được công nhận Vilas, thông số in nghiêng được thực hiện bởi nhà thầu phụ
3. Nghiêm cấm sao chép dưới mọi hình thức nếu chưa có được sự đồng ý của Wemos.

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Appendix A6 - MINUTES OF STAKEHOLDERS MEETING

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập- Tự do- Hạnh phúc

BIÊN BẢN HỘI NGHỊ THAM VẤN CỘNG ĐỒNG XÃ QUỲNH THẮNG VỀ BÁO CÁO ĐÁNH GIÁ TÁC ĐỘNG MÔI TRƯỜNG

Tiêu dự án “Sửa chữa, nâng cấp hồ chứa nước Khe Sân, xã Quỳnh Thắng, huyện Quỳnh Lưu”

I. Thời gian: Ngày tháng năm 2015

II. Địa điểm: UBND xã Quỳnh Thắng, huyện Quỳnh Lưu, tỉnh Nghệ An.

III. Các thành phần tham dự:

1. Đại diện Chủ đầu tư: Ban QLDA ngành NN và PTNT tỉnh Nghệ An

Ông: Trần Vĩnh Thắng Chức vụ: Phó giám đốc

Ông: Phan Doãn Hòa Chức vụ: Kỹ thuật

2. Đại diện tư vấn môi trường: Trung tâm Môi trường và Phát triển

Ông: Hoàng Xuân Trường Chức vụ: Giám đốc

Ông: Trịnh Anh Nam Chức vụ: Đội trưởng

Bà: Nguyễn Thị Chung Chức vụ: Chuyên gia môi trường

Bà: Chức vụ:

Ông: Chức vụ:

3. Đại diện Ủy ban nhân dân xã: Quỳnh Thắng

Ông: Trần Thị Thương Chức vụ: Phó Chủ tịch

Ông: Nguyễn Văn Điền Chức vụ: Bí thư Đảng ủy

4. Đại diện cộng đồng xã:

Xóm trưởng các xóm hưởng lợi từ dự án

Tổng cộng số người tham gia hội nghị: 20 người.

Chủ trì Hội nghị:

Bà: Trần Thị Thương Chức vụ: Phó Chủ tịch

Thư ký:

Bà: Nguyễn Thị Chung Chức vụ: Cán bộ hỗ trợ

IV. Nội dung Hội nghị:

- Chủ đầu tư giới thiệu mục tiêu, ý nghĩa của buổi tham vấn cộng đồng về ảnh hưởng của dự án tới môi trường, xã hội kinh tế khu vực dự án.
- Chủ đầu tư giới thiệu các hạng mục đầu tư và hoạt động của dự án.
- Cơ quan tư vấn trình bày các tác động môi trường tiềm tàng trong giai đoạn thi công xây dựng, giai đoạn vận hành dự án và các biện pháp giảm thiểu.
- Thảo luận các vấn đề về dự án, các tác động môi trường của dự án và các biện pháp giảm thiểu.

V. Ý kiến của đại diện chính quyền địa phương và cộng đồng

1. Bà Trần Thị Thương – Phó Chủ tịch UBND

- Quy trình thực hiện dự án từ chủ trương đầu tư đến khi thi công rất chặt chẽ. Việc thực hiện báo cáo đánh giá tác động môi trường của dự án này là nghiêm túc.
- Các vấn đề về ô nhiễm môi trường do dự án gây ra có nhưng không đáng kể
- Trước khi thi công đề nghị chủ đầu tư công khai thông tin để xã có trách nhiệm giám sát cộng đồng.
- Thông báo trước lịch thi công ít nhất là 02 tuần.
- Sửa chữa những đoạn đường hư hỏng do xe vận chuyển của dự án gây ra trên địa bàn.
- Nhất trí thực hiện dự án trên địa bàn của địa phương.

2. Ông Nguyễn Văn Điền – Bí thư đảng ủy

- Đập khe Sân đã được xây dựng từ lâu, qua quá trình vận hành sử dụng đến nay đã xuống cấp nghiêm trọng, mức nước chứa không đảm bảo dung tích phục vụ cho sản xuất. Mái hạ lưu đã xuống cấp, lượng nước rò rỉ trong hồ xảy ra thường xuyên. Vì vậy chủ trương đầu tư sửa chữa đập là hoàn toàn đúng đắn, đáp ứng được nhu cầu nguyện vọng của nhân dân.
- Khu vực đập cách xa khu dân cư nên tiếng ồn, bụi trên công trường ít ảnh hưởng đến đời sống nhân dân.
- Đẩy nhanh tiến độ, đảm bảo đủ nước tưới cho người dân vào vụ sản xuất.

3. Ông Nguyễn Văn Nam – Cán bộ Nông nghiệp

- Quá trình thi công đặc biệt là quá trình vận chuyển không để đất đá rơi vãi trên đường.
- Vấn đề an ninh, đề nghị chủ đầu tư phối hợp chặt chẽ với UBND xã để quản lý tốt đội ngũ công nhân làm việc trên công trường.
- Tránh vận chuyển nguyên vật liệu và các hoạt động gây tiếng ồn trong giờ cao điểm.
- Tiến hành phun nước tưới ẩm những đoạn đường dễ phát sinh bụi vào ngày nắng nóng, khô hanh.

Kết luận :

Đồng tình dự án được thực hiện trên địa bàn xã.

Nhất trí với các đánh giá tác động môi trường, với các biện pháp giảm thiểu tác động môi trường của báo cáo đánh giá tác động môi trường.

Bổ sung các ý kiến góp ý trong hội nghị.

Địa phương cam kết phối hợp thực hiện các biện pháp giảm thiểu.

Đề nghị cơ quan thẩm quyền phê duyệt báo cáo đánh giá môi trường và phê duyệt Dự án.

Đại diện chính quyền địa phương
Chủ tịch UBND xã



Đại diện cơ quan tư vấn
Trung tâm Môi trường và Phát triển
Giám đốc



Hoàng Xuân Cường

Thư ký cuộc họp

Đại diện Chủ dự án
Ban QLDA ngành Nông nghiệp và PTNT



Trần Vĩnh Thắng

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

BIÊN BẢN CUỘC HỌP THAM VẤN CÁC NGÀNH LIÊN QUAN

1- Tên dự án: **Sửa chữa, nâng cấp hồ chứa nước Khe Săn thuộc dự án sửa chữa, nâng cao an toàn đập tỉnh Nghệ An (WB8)**

2- Tiểu dự án:

3- Thời gian họp:ngàythángnăm 2015

4- Địa điểm họp:

5- Thành phần cuộc họp

a) Đại diện Sở NN và PTNT **Tỉnh Nghệ An**

Ông (bà): **Nguyễn Văn Đức**

Chức vụ: **Phó Giám đốc**

b) Đại diện Sở TN&MT **Tỉnh Nghệ An**

Ông (bà): **Trương Văn Đình**

Chức vụ: **Chuyên viên**

c) Đại diện Ban Quản lý dự án **Nghệ Tĩnh và Phát triển Nông thôn Nghệ An**

Ông (bà): **Đỗ Văn Kinh**

Chức vụ: **Phó Giám đốc**

d) Đại diện UBND các huyện **Quỳnh Lưu**

Ông (bà): **Nguyễn Xuân Đình**

Chức vụ: **Tướng phòng Nông nghiệp**

Ông (bà):

Chức vụ:

Ông (bà):

Chức vụ:

e) Đại diện UBND các xã vùng dự án: **Quỳnh Thắng**

Ông (bà): **Trần Văn Thắng**

Chức vụ: **Phó Chủ tịch**

Ông (bà):

Chức vụ:

Ông (bà):

Chức vụ:

Ông (bà):

Chức vụ:

Ông (bà):

Chức vụ:

f) Đại diện đơn vị tư vấn: **Tư vấn Nông thôn và Phát triển**

Ông (bà): **Trương Xuân Thắng**

Chức vụ: **Giám đốc**

Ông (bà):

Chức vụ:

6. Nội dung cuộc họp

a) Đại diện Ban QLDA, ông: trình bày nội dung các TDA.

b) Đại diện đoàn tư vấn: giới thiệu các chính sách an toàn môi trường của WB và Chính phủ Việt Nam và xã hội, tiến độ chuẩn bị dự án và các tài liệu chuẩn bị.

7. Các ý kiến thảo luận:

7.1- Về phạm vi ảnh hưởng của dự án và các đối tượng bị ảnh hưởng:

a) Về phạm vi ảnh hưởng (Ghi số xã, huyện, số hộ, số người, diện tích đất tự nhiên trong vùng dự án):

Ảnh hưởng đến xã huyện Thăng với số hộ bị ảnh hưởng là 400 hộ, 1.800 người.

b) Về các đối tượng bị ảnh hưởng (Đất nông nghiệp, đất lâm nghiệp, thủy sản và các loại khác, số hộ bị ảnh hưởng (thu hồi đất, di dân, di chuyển chỗ ở...), tỷ lệ người dân tộc thiểu số bị ảnh hưởng, số người được hưởng lợi, tỷ lệ hộ nghèo, di tích lịch sử văn hóa, số chỗ ở bị di dời):

Trong khu vực dự án không có di tích lịch sử, mộ mả, không ảnh hưởng đến người dân tộc thiểu số trên địa bàn.

7.2 Về tác động của dự án đến môi trường:

- Tác động tích cực (hạn chế ngập lụt vùng hạ du, hạn chế các sự cố vỡ đập, tràn, cống, tạo việc làm, tăng thu nhập, tăng diện tích tưới, tăng năng suất cây trồng, NTTS, nâng cao đời sống... vùng được hưởng lợi và đối tượng được hưởng lợi):

Nâng cao an toàn cho hệ đập, ổn định tưới cho 120 ha đất sản xuất Nông Nghiệp từ đó nâng cao đời sống cho người dân vùng dự án.

- Tác động tiêu cực (Tác động tiêu cực có thể xảy ra trong quá trình chuẩn bị, thi công và vận hành dự án và những khu vực bị ảnh hưởng, đối tượng bị ảnh hưởng. Các tác động tiêu cực có thể xảy ra như: Ô nhiễm môi trường đất, nước, không khí, sản xuất, thu nhập, mất việc làm, bị ngừng các dịch vụ công cộng...):

Quá trình thi công dự án sẽ ảnh hưởng đến môi trường không khí, môi trường nước mặt và chất thải rắn, tuy nhiên tại đây này sẽ bố trí khi dự án đi vào hoạt động.

7.3- Tác động của dự án đến xã hội:

- Tác động tích cực (Tạo việc làm, tăng thu nhập, tăng diện tích tưới, tăng năng suất cây trồng, NTTS, nâng cao đời sống...)

Ổn định diện tích tưới, năng suất cây trồng, đời sống.

Nâng cao an toàn đập giúp người dân yên tâm sản xuất, sinh hoạt.

- Tác động tiêu cực:

Quá trình thi công sẽ tăng nguồn nhập củ nên có thể gây mất an ninh trật tự trên địa bàn.

7.4- Kiến nghị của các địa phương trong vùng dự án/ có đồng tình với các nội dung của dự án không?

thân thiện nhất tại cơ sở việc dự án thực hiện trên địa bàn
vùng địa phương

7.5- Kiến nghị của các ngành liên quan:

thân thiện nhất tại cơ sở việc thực hiện dự án

8- Kết luận:

Các ngành liên quan và chính quyền địa phương đồng ý và
việc thực hiện dự án
Để nghị chủ đầu tư sớm tiến hành thực hiện dự án để
nhằm người dân ở tỉnh sản xuất

Chủ trì hội nghị

Thư ký hội nghị

Sở Nông nghiệp & PTNT
SỞ
NÔNG NGHIỆP
VÀ PHÁT TRIỂN
NÔNG THÔN
TỈNH NGHỆ AN
Ban Quản lý dự án
CỤ AN NÔNG NGHIỆP & PTNT
NÔNG THÔN
TỈNH NGHỆ AN
Điền Vĩnh Thắng
UBND Huyện Quỳnh Lưu

Sở TN&MT
Hàng Thanh Bình
Trung tâm Môi trường và Phát triển
TRUNG TÂM
MÔI TRƯỜNG
VÀ
PHÁT TRIỂN
UBND xã Quỳnh Lưu

Nguyễn Xuân Dũng

Điền Vĩnh Thắng

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

**Dự án: Sửa chữa, nâng cấp hồ chứa nước Khe Sân thuộc dự án sửa chữa, nâng
cao an toàn đập tỉnh Nghệ An (WB8)**

Ý KIẾN THAM VẤN CẤP XÃ VÀ CỘNG ĐỒNG TRONG VÙNG DỰ ÁN

Quỳnh Hương ngày tháng năm 2015

Sau khi nghe Ban Quản lý dự án trình bày tóm tắt nội dung, các hạng mục của TDA và tư vấn trình bày về các tác động của dự án đến môi trường và các biện pháp giảm thiểu, UBND xã có ý kiến như sau:

1. Về sự đồng thuận của địa phương đối với dự án:

Địa phương hoàn toàn nhất trí với việc dự án được thực hiện trên địa bàn và mong dự án sớm được khai

2. Về phạm vi ảnh hưởng của dự án và các đối tượng bị ảnh hưởng:

- Về phạm vi ảnh hưởng: *thủ tục, thủ công và các huyện, tỉnh, xã, thôn, xóm, khu vực*

- Về các đối tượng bị ảnh hưởng: *Công nhân làm việc trên công trường và người dân sinh sống tại huyện, tỉnh, xã, thôn, xóm, khu vực*

3. Về những tác động của Dự án đến môi trường tự nhiên và kinh tế - xã hội:

3.1. Tác động tích cực:

Dự án khi hoàn thành sẽ cung cấp việc làm cho các lao động SXNN xã Quỳnh Hương, từ đó ổn định thu nhập và đời sống của nhân dân xã Quỳnh Hương.

3.2. Tác động tiêu cực

Trong quá trình thi công dự án sẽ tạo ra tiếng ồn, bụi, khói, mùi, nước thải, chất thải rắn, khu vực dự án

4. Các sự cố môi trường từ sau khi xây dựng công trình và đưa vào sử dụng:

Bảng: Thống kê các sự cố phát sinh từ khi XD công trình

TT	Sự cố phát sinh	Năm	Khu vực BAH	Mức độ AH đến MT, XH	Các biện pháp khắc phục/ kết quả khắc phục

5. Kiến nghị các biện pháp giảm thiểu tác động môi trường của Dự án:

Đón và xử lý công nhân thợ hập với chất lượng địa phương
hệ chất chế tạo công nhân hập công nhân.

6. Kiến nghị đối với chủ dự án:

Chủ đầu tư phải nghiêm túc thực hiện các biện pháp giảm
thiểu tác động như đã nêu
Sẵn sàng khai thác hiện tại an

UBND XÃ... Huyện... Huyện
Chủ tịch



**ỦY BAN NHÂN DÂN
XÃ QUỲNH THẮNG**

Số: 15 /UBND

V/v: Tổ chức tham vấn cộng đồng báo cáo
Đánh giá tác động môi trường của dự án
"Sửa chữa, nâng cấp hồ chứa nước Khe Sân,
xã Quỳnh Thắng, huyện Quỳnh Lưu".

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

Quỳnh Thắng, ngày 26 tháng 3 năm 2015

Kính gửi: - Sở Nông nghiệp và PTNT tỉnh Nghệ An;
- Ban QLDA ngành NN&PTNT.

UBND xã Quỳnh Thắng nhận được Công văn số 869/BQLDA ngày 06 tháng 10 năm 2014 của Ban QLDA ngành Nông nghiệp và PTNT tỉnh Nghệ An về việc tổ chức tham vấn cộng đồng báo cáo Đánh giá tác động môi trường của dự án "Sửa chữa, nâng cấp hồ chứa nước Khe Sân, xã Quỳnh Thắng, huyện Quỳnh Lưu".

Sau khi xem xét tài liệu và tổ chức các hội nghị tham vấn cộng đồng về Báo cáo đánh giá tác động môi trường của dự án, Ủy ban nhân dân xã Quỳnh Thắng có ý kiến như sau:

- Hoàn toàn nhất trí với việc xây dựng dự án và mong dự án sớm thực hiện và đưa vào sử dụng.

- Việc xây dựng dự án có ý nghĩa quan trọng trong việc cung cấp nước cho sản xuất nông nghiệp của người dân xã Quỳnh Thắng.

Các giải pháp và biện pháp giảm thiểu các tác động xấu của Dự án đến môi trường tự nhiên và kinh tế - xã hội được trình bày trong Báo cáo đánh giá tác động môi trường có ý nghĩa thực tế và mang tính khả thi cao. UBND xã Quỳnh Thắng đồng ý với các biện pháp, giải pháp đã đề xuất.

- Trong quá trình thi công dự án chủ đầu tư phải thực hiện các biện pháp giảm thiểu tác động tới môi trường. Tưới ẩm tuyến đường vận chuyển nguyên vật liệu vào các ngày nắng nóng, khô hành với tần suất 3 lần/ngày.

- Quá trình vận hành dự án đơn vị quản lý phải tiến hành giám sát chất lượng công trình để tránh các sự cố như vỡ đập...

- Đơn vị vận hành quản lý phải vận hành công trình đúng quy trình.

Trên đây là ý kiến của UBND xã Quỳnh Thắng gửi Sở Nông nghiệp và PTNT,
Ban QLDA ngành NN&PTNT để tổng hợp và xử lý./.

Nơi nhận:

- Như kính gửi;
- Lưu: VT.

TM. ỦY BAN NHÂN DÂN XÃ
CHỦ TỊCH



CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự Do - Hạnh phúc
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Quỳnh Thắng, Ngày.....tháng.....năm 2015

DỰ ÁN: Sửa chữa, nâng cấp hồ chứa nước Khe Săn, xã Quỳnh Thắng,
huyện Quỳnh Lưu tỉnh Nghệ An

**BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG VỀ ĐÁNH GIÁ MÔI TRƯỜNG, TÁI ĐỊNH
CƯ VÀ PHÁT TRIỂN DÂN TỘC THIỂU SỐ**

Tiểu dự án: Sửa chữa nâng cấp hồ chứa nước Khe Săn
Xã Quỳnh Thắng, huyện Quỳnh Lưu tỉnh Nghệ An

I. Thành phần tham dự

- Ông/Bà Đào Văn Lạc..... Chức vụ Chủ tịch xã
- Ông/Bà Phạm Văn Cường..... Chức vụ Chủ tịch pháp chế
- Ông/Bà Già Công Hùng..... Chức vụ Đại diện hộ dân
- Ông/Bà Trần Văn Hùng..... Chức vụ phó ban QLDA
- Ông/Bà Phó Thị Hằng..... Chức vụ Đội trưởng
- Ông/Bà Trần Thị Hoa..... Chức vụ Chuyên gia xã hội
- Đại diện những người bị ảnh hưởng: người (chủ yếu xem danh sách đính kèm)

II. Nội dung tham vấn

Chuyên gia môi trường trình bày những tác động môi trường bao gồm tác động lên môi trường tự nhiên và xã hội của khu vực dự án và những biện pháp giảm thiểu các tác động tiêu cực.

Chuyên gia tái định cư trình bày về những tác động khi thu hồi đất và các tài sản trên đất, những chính sách của Chính phủ nước Cộng hòa xã hội chủ nghĩa Việt Nam và địa phương, chính sách của dự án trong vấn đề bồi thường thiệt hại khi Nhà nước thu hồi đất đai và các tài sản trên đất.

Chuyên gia về cộng đồng, dân tộc thiểu số trình bày về Khung chính sách dân tộc thiểu số của dự án, các tác động xã hội trong quá trình thực hiện dự án, Giới thiệu với cộng đồng về những chính sách của Chính phủ nước Cộng hòa xã hội chủ nghĩa Việt Nam và địa phương về dân tộc thiểu số.

III. Ý kiến thảo luận

III.1 Về các tác động môi trường tiêu cực và biện pháp giảm thiểu

Sửa chữa hàng cấp khu vực đầu mối hạ tầng nước
Khe Sỏi, xã Chưsinh Thôn

Kho gạo Sửa chữa Đập, trấn chỉnh quản lý

Đi phát và một số tài liệu về môi trường sống địa phương

- Giải pháp mặt bằng

- Thị công xây dựng

- Văn bản

Được đánh giá là thấp và có giải pháp giảm thiểu.

Khu vực hạ tầng khu vực dân cư thôn, vùng này thôn, thôn
nên xây dựng ở hạ tầng thôn và nên chỉ tăng giải pháp xây
dựng và vùng này thôn thì cũng và chỉ dân cư có giải pháp giảm thiểu

III.2 Về các vấn đề thu hồi đất và các tài sản trên đất và các chính sách

Cần tổ chức quản lý đất đai, và các tài sản trên đất
sách an toàn để phục vụ cho việc thu hồi đất và các tài sản trên đất
an, dịch sách an toàn.

Người dân địa phương muốn được giải quyết đất đai khi giúp
bà con thôn họ để thu hồi và an toàn để phát triển
kinh tế xã hội. Nếu dân chúng cần đất áp dụng chính sách
đất đai đất.

- Giải các vấn đề dân cư phân định các tài sản và vùng
quản đất đai có yêu cầu

III.3 Về các vấn đề về dân tộc thiểu số

- Cần có người dân tộc thiểu số bị ảnh hưởng đến vùng
muốn được giải quyết đất đai khi giúp phân định phát triển
kinh tế xã hội, chỉ đất an toàn vùng dân

- Mọi người dân tộc thiểu số muốn được giải quyết đất đai
khi và sau đây tham gia

IV. Kết luận

- Cuộc họp thống nhất 100% xã viên tham dự đại hội xã viên được bầu bầu đại hội
- 100% xã viên bị kỷ luật bị kỷ luật đại hội xã viên xã viên giữ kỷ luật và tuân thủ theo đúng chế sách
- Xã viên tham gia tuy gia đình gia đình phải phải phải và gia đình thi song
- Tất cả đại hội xã viên đại hội xã viên đại hội xã viên

Cuộc họp đại hội thống nhất kết thúc lúc 18h30 ngày
tháng năm 20

Đại diện Chủ tịch tư



Đại diện cộng đồng

Thư

Đại diện tư vấn

Thư

Đại diện UBND xã



Trần Vĩnh Thành

Lý Công Hùng

Phạm Thị Hằng

..... *Amphip* *Alcivig* *noim* 2015

Phạm Thị Hằng

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

..... Ngày..... tháng..... năm 2015

BIÊN BẢN XÁC NHẬN BÀI KHAI THÁC VẬT LIỆU ĐẤT ĐẬP

Công trình: Sân chơi nâng cấp hồ chứa nước Khe Săn

Xã: Quỳnh Hoàng huyện Quỳnh Lưu, tỉnh Nghệ An

Hôm nay, ngày..... tháng..... năm 2015, tại Xã Quỳnh Hoàng,

Quỳnh Lưu..... chúng tôi gồm:

I. Đại diện đơn vị lập báo cáo ĐTM:

- Ông/Bà: Phạm Thị Hằng..... Chức vụ Chủ tịch

- Ông/Bà: Nguyễn Văn Hùng..... Chức vụ Chủ tịch

II. Đại diện địa phương: xã Quỳnh Hoàng, Quỳnh Lưu, Nghệ An

- Ông/Bà: Nguyễn Văn Hùng..... Chức vụ Chủ tịch

- Ông/Bà: Nguyễn Văn Hùng..... Chức vụ Chủ tịch

Cùng xác nhận vị trí bài khai thác vật liệu cho công trình tại hiện trường như sau:

Vị trí: thôn xóm 1 xã Quỳnh Hoàng, Quỳnh Lưu

Tình trạng sở hữu:

UBND xã quản lý

Trở lượng: 0,1 ha

Cơ li vận chuyển: thông thoáng

Mô tả môi trường xung quanh bài khai thác:

to khu đất này thông thoáng nhìn ra khu dân

cư thôn 8.0 m

Chủ sở hữu đồng ý cho khai thác vật liệu đất xây dựng dự án

Biên bản được thông qua, các bên nhất trí kí tên/.

Xác nhận của địa phương

Đại diện chủ mô đất

Đơn vị lập báo cáo ĐTM



Nguyễn Văn Hùng
Phạm Thị Hằng

Trần Vĩnh Hằng

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

..... Ngày..... tháng..... năm 2015

BIÊN BẢN XÁC NHẬN VỊ TRÍ LÁN TRẠI

Công trình: Sân chôn cất cấp 1 - khu vực phía Sơn
Xã: Quỳnh Hoàng, huyện Quỳnh Lưu, tỉnh Nghệ An

Hôm nay, ngày..... tháng..... năm 2015, tại Xã Quỳnh Hoàng, huyện Quỳnh Lưu
chúng tôi gồm:

I. Đại diện đơn vị lập báo cáo ĐTM: Viên

- Ông/Bà Phạm Thị Hằng Chức vụ TV dự án
- Ông/Bà Đặng Thị Kha Chức vụ CG xã hội

II. Đại diện địa phương: UBND xã Quỳnh Hoàng

- Ông/Bà Bà Văn Tiến Chức vụ chính xã
- Ông/Bà Phạm Văn Cường Chức vụ Cán bộ pháp chế

Cùng xác nhận vị trí xây dựng lán trại thì công cho công nhận tại hiện trường như sau:

Vị trí: giao khu vực đất công khai ở xã Sơn

Tình trạng sở hữu:

UBND xã quản lý

Diện tích: 1 ha đất công

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

không đất công

Yêu cầu đơn vị thi công sau khi hoàn thành công trình hoàn trả lại hiện trạng cho khu đất trước
để xây dựng lán trại thi công.

Biên bản được thông qua, các bên nhất trí ký tên/

Xác nhận của địa phương



VĂN TIẾN

Đại diện chủ đầu tư



Trần Vĩnh Thắng

Đơn vị lập báo cáo ĐTM, Viên

Phạm Thị Hằng

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

....., Ngày.....tháng.....năm 2015

BIÊN BẢN XÁC NHẬN VỊ TRÍ ĐỒ THẢI

Công trình: Sửa chữa công cấp hạ tầng nhà kho Sầu
Xã Quỳnh Hoàng, Quỳnh Lưu, Nghệ An
Hôm nay, ngày.....tháng.....năm 2015, tại Xã Quỳnh Hoàng, Quỳnh Lưu
chúng tôi gồm:

- I. Đại diện đơn vị lập báo cáo DTM: TV
- Ông/Bà Phạm Thị Hoàng Chức vụ.....
 - Ông/Bà Đặng Thị Hòa Chức vụ.....
- II. Đại diện địa phương: UBND xã Quỳnh Hoàng
- Ông/Bà Đào Văn Tiến Chức vụ Chủ tịch UBND xã
 - Ông/Bà Nguyễn Văn Bình Chức vụ Đại diện gia đình

Cùng xác nhận vị trí đồ thải công trình tại hiện trường như sau:

Vị trí: Thước kẻ ngoài xóm 7

Tình trạng số hữu:

Đo UBND xã quản lý

Trữ lượng: chưa 2.000 m³

Cự li vận chuyển: không cách xa cầu đống từ 0,5 → 1 km

Mô tả môi trường xung quanh bãi đồ thải:

Thước kẻ cách xa khu dân cư

Yêu cầu đơn vị thi công khi đổ đất phải lần lượt, gọn gàng, khi đổ xong phải san gạt cho bằng phẳng.

Biên bản được thông qua, các bên nhất trí kí tên.

Xác nhận của UBND



Đại diện gia đình

Nguyễn Văn Bình

Đơn vị lập báo cáo DTM: TV

Phạm Thị Hoàng

Đại diện chủ đầu tư

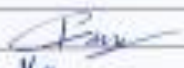



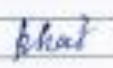

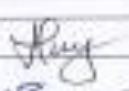
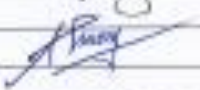
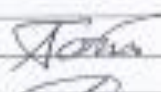
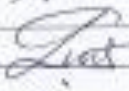
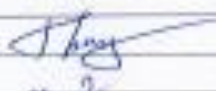
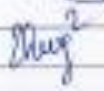

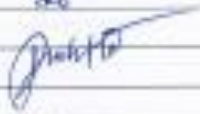



Trần Vĩnh Cường

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự Do - Hạnh phúc

DANH SÁCH NHỮNG ĐẠI BIỂU THAM DỰ CUỘC HỌP
THAM VẤN CỘNG ĐỒNG VỀ ĐÁNH GIÁ MÔI TRƯỜNG, TÀI ĐỊNH CƯ VÀ
PHÁT TRIỂN DÂN TỘC THIỂU SỐ,

STT	Họ và tên	Địa chỉ	Chữ ký	
1.				
2.	Lê Công Yên	Xóm 9, DT		20.000
3.	Nguyễn Ngọc Việt	nt		20.000
4.	Trần Văn Sơn	nt		20.000
5.				
6.	Lê Công Hải	Xóm 9, DT		20.000
7.				
8.	Trần Ngọc Khai	Xóm 9, DT		20.000
9.				
10.	Nguyễn Văn Thắng	nt		20.000
11.				
12.	Lê Công Hùng	nt		20.000
13.				
14.	Đinh Văn Thủy	nt		20.000
15.				
16.	Vũ Văn Tâm	nt		20.000
17.				
18.	Đi Văn Bích	nt		20.000
19.				
20.	Lê Công Thiệp	nt		20.000
21.				
22.	Trần Đức Hùng	nt		20.000
23.				
24.	Hồ Văn Đức	nt		20.000
25.				
26.	Nguyễn Đình Kha	nt		20.000
27.				
28.	Trần Văn Núi	nt		20.000
29.				

STT	Họ và tên	Địa chỉ	Chức vụ	
30.	Mai Văn Hào	xóm 7	Hà Nội	20000
31.	Nguyễn Bá Lương	nt	Định	20000
32.	Nguyễn Thị Thuận	nt	Thị trấn	20000
33.				
34.	Cao Văn Nguyên	nt	Nguyễn	20000
35.				
36.	Trần Nhật Tân	xóm 7, QT	Thị trấn	20000
37.				
38.	Cao Thị Duyên	xóm 7, QT	Thị trấn	20000
39.				20000
40.	Hồ Văn Đạt	xóm 7, QT	Định	20000

.....NgàyTháng.....năm 2015

Xác nhận địa phương



Appendix A7- PICTURES OF CURRENT CONDITION OF SUBPROJECT AREA

Appendix 8.1: CURRENT CONDITION OF SUBPROJECT AREA



CURRENT CONDITION OF SPILLWAY



CURRENT CONDITION OF DAM



CURRENT CONDITION OF WATER INTAKE



CURRENT CONDITION OF DAM CREST



CURRENT CONDITION OF ROAD MANAGEMENT



CURRENT CONDITION OF LEAKING



CURRENT CONDITION OF LANDFILL

Appendix 7.2: PICTURE OF STAKEHOLDER MEETING



Work with Khe San reservoir management unit and president of the Quynh Thanh commune



Community consultation meeting in Quynh Thang commune



APPENDIX B – SOCIAL

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 worsen 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 9 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 4 for how the Sampling Frame).

A total of 360 of respondents participated in the SA exercise for this subproject, of which 310 people participated in the households survey (quantitative), and 50 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 9 of this ESIA, and the public health intervention plan and public consultation and communication plan were presented at Appendix 7 and 8, respectively).

Appendix B2: PUBLIC HEALTH MANAGEMENT PLAN

1. Purposes:

- Better control of contractor, local government to risks relating to public health during subproject construction period;
- Enhance awareness of local people, government, workers in subproject area to understand potential impacts on health during subproject construction period;
- People understand how to make feedback on issues relating to health arising during subproject construction period;
- Local people are informed, updated construction schedule so that they can make plan to prevent disease may endanger community during subproject construction period.

2. Subjects of management

- Risk factors relating to diseases in construction site, workers' camp, disposal site and in community;
- Risk factors affecting the problem of unsafe work, in traffic, especially on transportation road;
- Workers' camp, especially the toilets and cooking area of workers;
- The compliance of workers in ensuring safety and prevention of disease;
- The sensitive sites / sources of wastes arising disease

3. Issues need to be managed

- What kind of diseases, especially common infectious diseases in project area;
- The risk of transmission of infectious disease or risk affecting community health workers due to workers from elsewhere staying in locality;
- The risk of affecting public health due to noise, dust arising from the automotive, construction machinery; and from the disposal or wastes from worker camps
- Risk of accident risk for people at the project construction site
- The risk of accident to the community when the number of trucks transporting construction materials increases
- The risk of dam safety for farmers downstream.
- Reporting mechanism to make feedback on the problems related to the outbreak of epidemics or safety problems for people in the community.

4. Implementation period:

Before and after the subproject construction period.

About 1 month before construction phase, contractors will cooperate with local authority to inform construction plan as well as potential negative impacts relating to public health.

5. Location:

- Workers' camp; Disposal site;
- Work site; In Quynh Thang commune.

6. Methods of management and supervision

a. Management and supervision indicators:

- Number of labor accidents caused by the subproject construction;
- Number of traffic accidents caused by means of transports served for the sub-project construction.
- Number of times/ number of workers are ill, especially infectious diseases;
- Availability of the medicine boxes in camps;
- Number of employees are guided / trained on issues related to community health;
- Documentation guiding the first aid/ responding to the epidemic, accident used by contractors and deliver to workers.

b. Management methods

- Contractors will assign his work commander or a worker to take in charge of occupational safety and health for workers to monitor and support related issues.
- Contractors shall coordinate with the communal health centers, village health officials to timely update the disease situation in the localities or health problems of workers that may spread out.
- Contractors shall coordinate with local authorities, health centers to inform on issues related to the safety of people in the site construction or along construction materials/ waste transport road.
- The CPC / medical station should actively inspect the hygiene, safety at construction sites and workers' camps.
- The Contractor shall coordinate with CPC/ medical station to agree on a coordination mechanism in case of accidents or disease outbreak.

7. Management, monitoring and implementation units

a. Nghe An Project Management Unit:

The PMU will be responsible for overall monitoring of all project activities, including media planning, public health consultation. The issues related to the public health are also reflected in the Grievance Redress of the Project.

b. Communal authorities:

Communal authorities are responsible for all matters arising in the commune in general. Communal authorities will assign the Community Monitoring Committee to monitor the communication activities, the local consultation.

c. Communal Health Centers:

The CHC will manage, monitor, provide initial aid, and report the public health problems in the commune. Therefore, the issues relating to public health will also be monitored, controlled and supported for these units.

d. Contractors:

The commander of the work will act on behalf of the contractors to collaborate with local governments to implement the communication activities, and consultations relating to the community health and workers.

8. Funding for the implementation

For contractors: Funding of contractors is included in the civil contract.

For health centers: There are no funding for these activities because it is the responsibility of the medical units to manage the public health.

Appendix B3: PUBLIC CONSULTATION, PARTICIPATION AND COMMUNICATION STRATEGY

1. Purposes:

- Raise awareness for local people, the local governments/ workers in the project areas to understand the potential impacts on the community health during project construction;
- Help people understand how respond to issues relating to public health arisen during the sub-project construction.
- People are informed, and updated the project implementation schedules prevent diseases that may cause harm to the community during the sub-project construction.

2. Subjects of communication, consultation

- People in the communes, especially in the project areas and villages/ hamlets where vehicles transporting construction materials travel.
- Medical staffs in communes and villages;
- Local authorities, officials of villages/ hamlets
- Workers and officials of the construction sites
- For the community, the participation of both men and women should be encouraged

3. Contents of communication, community health consultation

- Content of main categories of the subproject, fund for investment;
- Expected effectiveness of the subproject
- Subproject implementation arrangement in locality: information about project owner, construction contractor, monitoring will be done;
- Schedule, plan for construction of main work items;
- Potential impacts to environment and society and local people during construction stage;
- Participatory regime of local people, community monitoring procedure, grievances mechanism

4. Time: Before and after the subproject implementation process.

Approximately 1 month before the construction, the contractors will coordinate with local authorities to inform the community construction schedules as well as potential impacts related to public health.

5. Locations:

In project communes, priority is given to the sub-project construction areas.

6. Methods of communication, consultation

Communication activities, consultations are taken through the following main methods:

- *Communication through communal loudspeakers.* Currently, Quynh Thang commune has a loudspeaker system in all villages. Most of the other media activities to the community is done through this method. Therefore, loudspeakers will be used to

inform the people in the commune issues relating to public health arisen during the sub-project construction.

- *Community Meeting / Public Consultation*: This form will be implemented with the participation of workers in the rural communes of the Project; people in Quynh Thang where the sub-project is constructed and households along the road transporting of construction materials or disposal areas.
- *Communications integrated into activities of mass organizations or authorities*: the authorities often hold meetings with communal officials and the mass organizations in the village each month, therefore, the content of communications can integrated into these activities.

7. Implementers:

- Before the project is implemented:

The Safeguard Policies Consultant will perform the communications, public consultation on safeguard policies issues in general, including public health.

- During the project implementation:

The PMU, the Contractors will collaborate with local authorities and CHCs under construction and implementation of communication activities according to the aforementioned methods.

8. Implementation monitoring

The communication and community consultation plan relates to the participation and monitoring of the following units:

- **Nghe An Provincial Project Management Unit**: The PPMU will be responsible for overall monitoring of all project activities, including communication, public health consultation plan. The issues related to the public health are also reflected in the Grievance Redress of the Project.
- **Communal authorities**: Communal authorities are responsible for all matters arising in the commune in general. Communal authorities will assign the Community Monitoring Committee to monitor the communication activities, the local consultation.
- **Contractors**: The commander of the work will act on behalf of the contractors to collaborate with local governments to implement communication activities, and consultations relating to the community health and workers.

9. Implementation fund

The fund will be carried out mainly in the construction and construction preparation periods. Funding is shown the in following table:

Activities	Frequency	Quantity	Price unit	Estimate	Fund source
Announcement on loud speaker about construction activities	Once per week during construction stage	1 time x 78 weeks = 78 times	30.000 VND/1 time	2.340.000 VND	In contract of project owner with stakeholders
Large scale consultation meeting with representative of communal, district authority, and HHs related to construction of the project	Once per 3 months 3 during construction stage	6 times in 18 months	500.000 VND/1 meeting	3.000.000 VND	In contract of project owner with stakeholders
Stick on information board in CPC	Once per 2 weeks during construction stage	39 times during construction stage	50.000 VND/1 information board	1.950.000 VND	In contract of project owner with stakeholders
Total				7.290.000 VND	

Appendix B4 - GENDER ACTION PLAN

From the above analyses of gender, a gender action plan is needed to facilitate the full participation of women in the project construction stage, providing new opportunities for women to boost their income, without increased burden on their lives, and contributing to the enhancement of women's role and status in the project area. The objectives of this plan include:

- The local contractors will employ at least 30% of female workers in maintenance, construction and repair works;
- For a similar type of work, female workers should be paid as much as male workers;
- Safety conditions must be equal to both men and women;
- The local contractors will not use child labor;
- The use of local labors is encouraged and the establishment of labor camps will be avoided;
- The Women's Group and Union will be consulted about the design of subprojects;
- Training on gender mainstreaming will be provided for national, provincial and local authorities (i.e. PMUs, and other stakeholders);
- 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);
- The involvement of women in project study tours is ensured.
- The agricultural extension services aimed at women are designed and delivered to women;
- 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;
- At least one woman shall be involved in the Supervision Board of a commune (about 1/3 of the members).

Table B4-1 The Project's Gender Action Plan

Achievements	Tasks and Indicators	People in charge	Period
Achievement 1: Improvement of dam safety and irrigating conditions.	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	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	During construction stage

Achievements	Tasks and Indicators	People in charge	Period
	the Contractors for selection in favour of poor and vulnerable households.	involvement of local female workers in the Project.	
Achievement 2: Enhancement of people's capacity to make advantages of the Project	At least 30% of women shall participate in agricultural extension courses.	Staff of Provincial PMU, District staff, Communal staff.	During construction stage
Achievement 3: Enhancement of awareness on potential social evils of vulnerable objects, especially women and ethnic minorities	<p>Programs on HIV/AIDS and human trafficking.</p> <p>Programs on community-based risk mitigation.</p> <p>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).</p> <p>The documents and information should be appropriate in terms of language, culture and gender, and especially translated into ethnic languages in the region;</p> <p>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.</p> <p>-The programs will be implemented at the communes and villages by two communicators (village chief and one member of the Women's Union).</p> <p>-The program will be implemented in the villages and on market-days through distribution of project/program materials and use of loudspeakers</p>	<p>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.</p> <p>The Village's Women's Union shall popularize and communicate information.</p> <p>The district/communal Health Centers shall support the communal Women's Union.</p> <p>Project coordinator shall provide local and international gender experts and specialists on Ethnic Minorities.</p> <p>Gender experts and specialists on EM shall review existing materials and supplement the required ones for the Program.</p>	Monthly, before and during construction stage
	<p>Program on risk mitigation during project construction stage:</p> <p>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</p>	<p>PMU</p> <p>The Contractor</p> <p>Local Health Centre</p> <p>Communal staff</p> <p>The Women's Union shall perform general</p>	During construction stage.

Achievements	Tasks and Indicators	People in charge	Period
	<p>prevention, diagnosis and treatment for laborers.</p> <p>All programs and documents are built with integration of gender issues, including vulnerability and needs of men and women.</p> <p>The Contractor shall:</p> <p>Implement awareness enhancement programs workers and communities, including education and communication on HIV infection and preventive measures.</p> <p>Provide free consulting services and encourage employees to do HIV tests so that they all know about their health status.</p> <p>Support the access to health services and encourage HIV-infected patients to admit their status;</p> <p>Provide medical equipment (free condoms) for workers in the camps;</p>	coordination for better HIV prevention.	
Project Management	<p>Guidelines on Gender and Development and Education shall be provided for PMU staff, local agencies and Contractors.</p> <p>All capacity enhancement activities shall include the involvement of women and ethnic minorities.</p>	Project implementation consultant PPMU	During design and initial implementation stages

Table B4-2. Estimate cost for gender activities

No	Activity	Quantity	Budget	Evaluation indicators	
			(Mil. VND)	Number of beneficiaries	Number of activities
I	Activities related to gender		65,000,000		
1	Training and awareness raising on gender and gender mainstreaming	One two-day training course	16,000,000	80	
2	Training on HIV/AIDS prevention	2 training courses	12,000,000	90	
3	Training on enhancing capacity for community supervision board	2 training courses	17,000,000	60	
4	Communication on gender mainstreaming, HIV/AIDS prevention; sanitation and environment protection; and traffic safety	2 training courses	10,000,000	720	
5	Prepare Pano, poster, leaflet.		10,000,000	2000 flyers	

II	Other development activities		68,500,000		
1	Support equipment for commune women union		45,000,000	Commune women union	
2	Training and awareness raising on potential impacts of the subproject to people health		15,000,000	90	
3	Communication via the commune loudspeaker on the construction activities	One a week	2,500,000	900	
4	Consultation meeting at large scale with representatives of commune authority and district and related households.	Every three months	4,000,000	50	
5	Anouncement on the commune's notice board	Every two week	2,000,000	720	
TOTAL			133,500,000		

Appendix B5- GRIEVANCE REDRESS MECHANISM

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

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

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

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

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

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

- The person competent to settle first-time complaints should:

- Ask the complainant, relevant agencies, organizations and individuals to provide information, documents and evidence within 07 days of the request as a basis for grievance redress;
- Determine to employ or cancel the emergency measures as defined in Article 35 of this Law;
- The person competent to settle first-time complains should perform the following obligations:
 - To receive the complaint and issue a notice in writing to the complainant, agencies, organizations, or individuals entitled to appeal and the state inspection agencies at the same level of acceptance of resolving complaints against administrative decisions and actions;
 - To settle the complaints against administrative decisions and actions if required by the complainant;

To open a dialogue with the complainant and agencies, organizations and individuals concerned;

To decide grievance redress and be responsible before the law for settlement results. In case of complaints from authorized agencies, organizations and individuals, the results shall be notified to agencies, organizations and individuals in accordance with law;

To provide information, documents and evidence relating to the complaint for the complainant when they are required by the complainant for second-time settlement or appeal to the People's Court.

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

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

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

- Within 15 days from the date of decision of grievance redress, the person competent to settle the complaint for the second time shall announce the grievance redress decision by one of the forms specified in Clause 2 in Article 41 of the Law on Complaints.
- In case of announcement at a meeting, the attendees of the meeting must include: the person issuing the grievance redress decision, the complainant or their representatives, the person subject to complaint and agencies, organizations and individuals concerned. Before conducting a public meeting, the person competent to settle complaints must send a notice to agencies, organizations and individuals involved 3 days in advance.
- The announcement of grievance redress decision shall be made on the mass media (television, radio, printed and electronic newspaper). If the agency of the person competent to settle complaints has their own portal or website, the grievance redress decision should be made public on this portal or website. The minimum number of announcement is 02 times on radio, television, and printed publications. The period of announcement on electronic publications, portals or websites should be at least 15 days from the date of notification.

- In case of notice at the office or the Reception Room of agencies and organizations competent to settle complaints, the period for the notice of grievance redress decision to be posted up is at least 15 days.

The procedure for grievance redress consists of 4 stages as below:

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

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

The third stage in the Provincial People's Committee: The procedure for grievance redress against administrative decisions and actions of the Chairman of the Provincial People's Committee is (i) Within thirty (30) days (or 45 days for complicated cases) or within 45 days for remote areas (or 60 days for the complicated cases) from the date of issuance of administrative decisions and actions by the Chairman of the PPC regarding land management stipulated in Article 162 of Decree No.181/2004/ND-CP that people of relevant rights and obligations disagree with, the complaint can be filed to the PPC; (ii) The Chairman of the PPC shall settle the complaint within the time limit stipulated in Law on Complaints; (iii) The grievance redress decision of the PPC shall be publically available and sent to the complainant and other people of relevant rights and obligations; (iv) Within forty-five (45) days from the date of receipt of the settlement decision from the Chairman of the PPC that the complainant

does not agree with, the appeal may be filed to the People's Court. The time limit for appeal may be longer but not more than 60 days from the date of acceptance for complicated cases. In remote areas difficult for travelling, this period shall not exceed 60 days from the date of acceptance, and 70 days for complicated cases; (v) the body accepting the complaint shall record this in the Grievance redress Diary.

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

Appendix B6 – DESCRIPTION THE PREPARATION ACTIVITIES INCLUDING ORGANIZATION, INSTITUTION, MONITORING AND ASSESSMENT ACTIVITIES

Table B6-1: Arrangement implementing EMP

Organization	Role and responsibility		
	Subproject's preparation	Subproject's construction	Subproject's operation
CPO	Guiding the safeguard policies staffs of Project Management Board of province during the period for preparing Environmental and Social Impact Monitoring Report Review and contribute the ideas for report submitted by Provincial Project Management Board	Guiding the staffs of provincial Project Management Board in performing Environmental management plan during the construction period; Supervising the progress of project during construction phase; Assembling 6months report on environment from provincial Project Management Board;	Guiding the safeguard policies staffs of Provincial Project Management Board in Environmental management plan in the first operation year; Supervising the progress of project during the first operation year; Assembling Reports on environment from Provincial Project Management Board;
Provincial People's Committee	n/a	Project Owner has highest responsibility on environmental activities during construction time;	Project Owner has highest responsibility on environmental activities in term of the performance of EMP during operation period ,
Provincial Project Management Board	Hiring consultant and take the general responsibility on preparation ESIA and submit for approval; Guarantee the officers must be trained completely in environmental issues;	Taking the responsibility on implementing (EMP) in pre-construction and construction periods; Guarantee the detail of contract and bidding documents including environmental requirements; Conducting the investigation and supervision environmental issues during construction time; Coordinating Environmental Monitoring Report to CPO;	Taking the responsibility on implementing (EMP) in the first operation year; Conducting the investigation and supervision environmental issues in the first operation year; Assist project owner in giving out environmental requirements in operation procedure and maintenance project;

Organization	Role and responsibility		
	Subproject's preparation	Subproject's construction	Subproject's operation
District People's Committee	Approve Environmental protection Commitment (CEPs) of subproject in accordance with legal regulations of Vietnam Government;	Supervising the implementation of EMP via their internal supervision system;	Supervising the implementation of EMP via their internal supervision system;
Community Supervision Board and the other members of local community (CSBs ¹)	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;	Participating in environmental supervision activities according to the laws of Vietnam and joint in training courses.	Participating in environmental supervision activities according to the laws of Vietnam and joint in training courses.
Construction Supervision Consultant	n/a	Undertaking training courses on environment for Supervision consultant staffs Participating in environment supervision according to approved ESMP in ESIA Preparing monitoring report and submit to Provincial Project management Board	n/a
Construction Contractor	n/a	Preparing the detailed plan on environment monitoring on the field to meet EMP requirements of subproject; Apportion sources sufficiently to meet compulsory requirements and regulations of EMP on the field;	n/a

¹ CSBs, has been established according to Decision 80/2005/QĐ-TTg dated 18/04/2005 of Prime Minister on promulgating investment supervision regulation of community. Item 8 of Decree 80/2006/NĐ-CP provides for community monitoring chance the conformity, implementation supervision and investment result assessment in commune including environmental impacts.

Table B6-2: Environmental Supervision Plan

Mitigation measures	Parameters	Location	Method	Frequency	Responsibility	Expenses
Pre-construction period						
Implementing Resettlement Action plan	The number of affected households has been compensated Complaint arising relating to compensation and benefit	Affected area	Observation	Monthly or having the complaint from affected households	Provincial Project Management Board	A part of RAP expenses
Construction period						
1.1. Control water quality	Turbidity Measuring the volume of oil, odor and other waste water. Rubbish on the flow	Khe San reservoir and other flow near construction site	Observation, interview	Weekly after heavy rain or when having the feedback of local people	Contractor	Involved in contract
1.2 Minimizing dust arising	The number of concentrated dust	At the nearest residential area (Hamlet 1) Construction area	Survey, interview	Monthly or when having the feedback of local people	Contractor	Involved in execution contract
1.3 Minimizing noise arising	Noise level	- At the nearest residential area (Hamlet 1) Construction area	Survey, interview	Monthly or when having the feedback of local people	Contractor	Involved in execution contract
1.4 Traffic safety	The number of accident and accident reason The slow traffic time that affected by construction	- The road near residential area	Survey	Weekly or when having the feedback of local people	The local road management agency	Involved in execution contract Local budget
1.5. Solid waste management	Clean level of tents	Worker's tent	Observe	Monthly or when having the feedback	Contractor	Involved in construction contract

Mitigation measures	Parameters	Location	Method	Frequency	Responsibility	Expenses
	The volume of rubbish			of local people		
1.6 Asset management	Complaint of local people relating to construction activities of workers	Worker's tent The residential area near construction site/tents	Survey, interview	Weekly	Contractor	Involved in construction contract
1.7. The health and safety of local residents	The number of labor accident at construction site The number of work postponed due to accident or disease	Construction site; Construction site near residential area (Hamlet 1 and Hamlet 3, where having material transport lorries go through)	Observe and interview	Monthly	Contractor	Involved in construction contract
1.8. Construction rubbish management	The volume of dug soil The volume of reused dug soil The volume of dug soil has been moved to dumping yard The amount of material and other waste from construction site Rubbish from worker's tents	Construction site Worker's tent Dumping yard	Survey or interview	Monthly or when having the feedback of local people	Contractor	Involved in construction contract
Operation period						
2.1 Risks on dam	The leakage points of dam The number of dam break/overflow	Whole dam	Observe and interview	6 months/time	Operation management unit	State's budget

Mitigation measures	Parameters	Location	Method	Frequency	Responsibility	Expenses
2.2 Landslide in flood season	Number of landslide places Frequency of landslide	Whole dam	Observe and interview	Monthly or when having the feedback of local people	Operation management unit	State's budget

Table B6-3: Monitoring and Reporting system

Project's Phase	Type of report	Frequency	Responsibility	Agency receives report
Execution	Report on implementing ESMP presents environmental activities on the field complies rightly with ESMP and supervision results	Monthly	Construction contractor	
	Report on ESMP implementation of Construction Supervision Consultant present clearly activities comply rightly with ESMP and supervision results. The report includes (i) the main impacts during construction period (ii) propose the measures to minimize adverse impacts (iii) Assessment the result of performance measures to minimize adverse impacts to environment and social of construction contractor (iv) The results of problem solving and measure to overcome shortcomings from last report; (v) Proposing activities for minimizing environmental for the next construction period	Monthly	Construction Supervision Consultant	Project Management Board
	Report on environmental activities of subproject present clearly activities comply rightly with ESMP and supervision result	6 months/time	Provincial Project Management Board	CPO and WB
	The subproject's environmental report presents all environmental activities and conformity to ESMP	When the subproject finished	CPO	WB / MONRE

Project's Phase	Type of report	Frequency	Responsibility	Agency receives report
	Independent monitoring report on Environmental and Social Safety states the following contents: (i) Supervision result of construction scene; (ii) Community based Supervision result; (iii) Synthesis supervision results of execution supervision consultant; (iv) Result of environment monitoring and (v) Assessment results implementing ESMP and recommendation.	6 months/time or 3 months/time	Independent Environmental Consultant	Subproject Management Board and WB
Operation	Implementation report ESMP: Present clearly activities conform to commitment on ESMP of subproject during operation time	6 months/time in the first 02 operation years	People's Committee of Quynh Luu district	CPO and WB

Appendix B7- CHANCE FIND PROCEDURE

This Chance Find Procedure shall be provided to the Contractor as part of the contract documents. A copy shall also be kept by the sub-project contract manager/administrator.

If the Contractor discovers archaeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the contractor will carry out the following steps:

1. Stop the construction activities in the area of the chance find
2. Delineate the discovered site or area
3. Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the National Culture Administration take over
4. Notify the supervisory Project Environmental Officer and Project Engineer who in turn will notify the responsible local authorities and the Culture Department of Province immediately (within 24 hours or less)
5. Responsible local authorities and the Culture Department of Province would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of National Culture Administration. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values
6. Decisions on how to handle the finding shall be taken by the responsible authorities and Culture Department of Province. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage
7. Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities
8. Construction work could resume only after permission is given from the responsible local authorities or Culture Department of Province concerning safeguard of the heritage.
9. Implementation for the authority decision making to the management of the finding will be communicated in writing by relevant local authorities

Adopted as part of Sub-project safeguards:

Date: _____ by: _____

PMU Manager/Subproject Manager

Appendix B8- OUTLINE OF IMPLEMENTATING EMERGENCY PREPAREDNESS (EPP) FOR KHE SAN RESERVOIR

I. 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.

II. 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.

III. THE EMERGENCY PREPAREDNESS PLAN FOR KHE SAN DAM

Currently, the downstream of Khe San dam is settled and lived and stably produced by the people (including 1,800 people and 650 ha of land), especially about 200 m of the dam foot in the direction of downstream is Provincial road 598, this road linking the western region of Nghe An. If the dam is broken, the losses of lives and property of the people are immeasurable.

IV. 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 to the Provincial People's Committee for approval. This plan must be updated and 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.

V. 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.

VI. 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 Committee, 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 entire 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.

VII. 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.

VIII. 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.

IX. 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.

X. 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 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 planning 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.

XI. PROCEDURES

In the lowest alarming level, the relatively simple internal application procedure 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.

XII. 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.

XIII. 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.

XIV. 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.

XV. 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.

XVI. 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.

XVII. 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 B8-1. Estimation of EPP for 5 years

Year	Basic cost (million VND)	Human resources cost(million VND)	Cost of office operation(million VND)	Total cost (million VND)
1	50	120	30	200
2	20	120	30	170
3	5	120	30	155
4	5	120	30	155
5	5	120	30	155
Total	85	500	150	635

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.