TUYEN QUANG PROVINCIAL PEOPLE'S COMMITTEE
DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT

DAM REHABILITATION AND SAFETY IMPROVEMENT PROJECT (WB8)

REPORT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

SUBPROJECT: REPAIR AND IMPROVEMENT FOR SAFETY OF NGOI LA 2 RESERVOIR – TUYEN QUANG PROVINCE

Tuyen Quang, 5/2015

TUYEN QUANG PROVINCIAL PEOPLE'S COMMITTEE
DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT

DAM REHABILITATION AND SAFETY IMPROVEMENT PROJECT (WB8)

REPORT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

SUBPROJECT: REPAIR AND IMPROVEMENT FOR SAFETY OF NGOI LA 2 RESERVOIR – TUYEN QUANG PROVINCE

REPRESENTATIVE

OF THE PROJECT OWNER

Tuyen Quang, 5/2015

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AH	Affected Household
AP	Affected People
BOD	Biochemical Oxygen Demand
CPC	Communal People's Committee
CPO	Central Project Office (MARD)
CSB	Communal Supervision Board
CSC	Construction Supervision Consultant
DARD	Department of Agriculture and Rural Development
DO	Dissolved Oxygen
DONRE	Department Of Natural Resources and Environment
DPC	District People's Committee
EMDP	Ethnic Minority Development Plan
ESMP	Environmental and Social Management Plan
ESMoP	Environmental and Social Monitoring Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
GoV	Government of Vietnam
HH	Household
IMC	Irrigation Management Company
MARD	Ministry of Agriculture and Rural Development
MONRE	Ministry of Natural Resources and Environment
NTR	National Technical Regulation
OP	Operating Policies of the WB
PMU	Provincial Management Unit
NTR	National Technical Regulation
RAP	Resettlement Assessment Plan
RPF	Resettlement Policy Framework
WB	World Bank
WHO	World Health organization
WUA	Water User Association

SUMMARY

1. ***Background:*** Ngoi La 2 reservoir is located in Trung Mon commune, 7km far from Tuyen Quang city in the south. The reservoir was built in 1973, the most recent repair and upgrading was in 1999 with the budget from the former Ministry of Water Resources. The catchment area of the reservoir is of 16.7 km^2, water volume of $3,24x10^6$ m^3. The headwork cluster and auxiliary works of the Ngoi La 2 reservoir consist of following categories:

- ***Dam:*** homogeneous earth dam with the maximum height of 15m, length of 556 m. Crest elevation is at +44.8m; width of 3.5m;
- ***Spillway:*** Spillway width Btr = 5.0m; covered by reinforced concrete with thickness of 10cm; following by a chute and cushioning pool;
- ***Water intake:*** reinforced concrete structure, located on the right side of the dam; dimension b×h = 0.8×0.8 m. It is box sewer with regulator tower gate in upstream;
- ***Management and operation route:*** (i) Route to Ngoi La 2 from National road No. 2: already improved with asphalt road surface, width is of 3.5m; length L = 2,430m; (ii) Route from Ngoi La 1 reservoir to Ngoi La 2 reservoir: earth road, length L = 1,885m; steep slope, is slip in rainy season, difficult to travel.

2. The main purposes of upgrading and improvement safety of dam and reservoir are: (i) To ensure safety of the reservoir during operation and exploitation process, adapting to climate change and meeting increasing water demands of people in the downstream area, mitigating negative impacts on environment, landscape of reservoir foundation and downstream; (ii) To ensure original design goals of supplying water for 1,054 ha of rice and crop plants in current irrigated areas of communes named Trung Mon, Kim Phu of Yen Son district and wards named Y La, Tan Ha, Hung Thanh of Tuyen Quang city; and (iii) To ensure water supply for area of 15ha for aquaculture production. The subproject "***Repair and Improvement for Safety of Ngoi La 2 Reservoir, Tuyen Quang province"*** was proposed for investment funded by the World Bank, under Dam Rehabilitation and Safety Improvement Project (DRSIP)

3. Due to long time use, the construction has been seriously degraded. The problems of erosion, water leakage recorded in the construction system of Ngoi La 2 reservoir are included: erosion on the upstream slope, section from the upper water level is dropped by waves and seriously eroded; There are more erosion places with depth of 70 – 80 cm; The downstream toe is leaking, water seepage through the dam body caused local erosion on the dam body; The concrete structure spillway is eroded, drainage facilities are damaged forming the seepage flow along both inside and outside of the wall; curved upstream canal has width of 7-10m, is incapable to take flood water. Water intake is still manually operated, the operation bridge and covering house are damaged, operation gate is leaking, etc. Although several facilities had been reinforced, but many items of the work have been degraded, capability to store water is low, and unsafety during operation process may happen.

4. ***Description of the project:*** The activities under the project include: (i) fix seepage in dam body and foundation, fix local erosion places; (ii) change the valve and

gasket of water intake; (iii) expand spillway and build new bridge across the spillway; and (iv) upgrade management and operation route. The project has been designed and implemented in lines with environmental and social management framework (ESMF) and dam safety framework of WB, assuring to comply strictly with administrative regulations as well as criteria of Social Republic of Vietnam. The potential impacts during preparation and implementation periods of project has been assured sufficient determination, strictly supervision and management by detail plans and periodical reports submitted to management organizations.

5. ***Environmental and social impacts and mitigation measures:*** The project implemented will bring in considerable benefits to local community, such as: (i) Stabilize water supply, facilitate agriculture production and improve the life of local people; (ii) Dam safety improved will be secure about the life and production of people in downstream; (iii) Improve the landscape, ecosystem and microclimate conditions of the reservoir. However, the project implementation will be results of some potential adverse impacts and risks of natural and social environment, relating to: (i) Land acquisition and clearance, (ii) construction activities, and (iii) operation of the reservoir.

6. Detailed plan to prevent or mitigate the adverse impacts are described Environmental and Social Management Plan (ESMP).

7. 95% of affected people in sub-project area are Kinh people. There is no ethnic minority HH affected by the project.

8. For Ngoi La 2 sub-project implementation, total land of 22,100 m^2 will be permanently recovered, including: 300 m^2 of residential land of 01 household, 2,245 m^2 of garden land owned by 11 HHs and 19,555 m^2 of public land managed by commune; and 2,000 m^2 of land managed by commune will be temporary recovered for construction purpose. Only one HH has to move to another place. The affected household will be compensated and supported sufficiently complying with resettlement policy framework (RPF). The details are stated in project's RAP report. There are no grave, temple or any culture, belief, religious structures affected in the project area.

9. As calculated, 44.314 m^3 of excavated soil and 9,501 m^3 of filled soil will be used for all the construction activities. Because all filled soil can be utilized from excavated soil, there is no need to exploit other soil bank for the construction. Surplus excavated soil, covering plant and waste materials are dumped in disposal site area reserved of about 50,000 m^3. It is low-lying area which has been exploited soil in village No. 1, Trung Mon commune, about 2.5km far from the construction site. Other construction materials are purchased in center of Tuyen Quang city, transport distance is of about 7-15km. Around 20-30 workers will be mobilized in the short time (1 month) for preparation and land clearance period. The maximum of workers will be mobilized for the intensive construction. The number of workers is 50 people for this stage. 27 set of machines and vehicles will be used for the construction including: bulldozers (110 Cv), excavators, trucks, mixers (250litre), concrete pavers, generators, water pumps.

10. The project construction may arise negative impacts to natural environment (such as: increasing pollution of air, water, soil, noise, vibration, etc.) and social environment (traffic jam, social security, etc.). However, these impacts are partial, temporary with small sphere and can be prevented/minimized via:

(i) Ensuring to comply with Environmental and Social management plan of project,

(ii) Consulting with local authorities as well as local residents from project preparation period and maintain during project construction period,

(iii) Supervising closely project's implementation.

11. Environmental and Social Impacts Assessment (ESIA) report aims to make detail implementation plan in order to ensure natural environmental and social quality in project area. The entire process of project implementation will be closely monitored by the Provincial management unit (PMU), Department of Natural Resources and Environment (DONRE), construction supervision consultants (CSC), environmental management consultants and local communities. Monitoring process will be recorded and publicly periodically reported.

12. ***Plan to manage and mitigate impacts during project implementation process:*** To minimize potential adverse impacts during project implementation period, the following measures need to be done adequately under the close, uninterrupted and open consultancy with local authority and community, especially with AH:

(iv) Make sure that the environmental protection criteria will be stated in contract's terms of project and make clear with the contractors.

(v) Implementing mitigation measures adequately with the observation and modification suitably to actual conditions to achieve the highest minimization.

(vi) Supervising and monitoring closely the implementation of safety measures to ensure the mitigation measures should be sufficient and effectively implemented during project's implementation.

(vii) Planning and performing completely the stakeholder consultation during project's preparation and implementation.

13. Consultation meetings (3 meetings) on environmental and social issues were held in communes in project area with total number of participants of 85 people, from which 29 people area female. Majority of participants agreed with implementation of the project. Community's opinions focused on adverse impacts of the project to environment and society during construction stage.

14. ***Institutional arrangement:*** Central Project Office (CPO) takes responsibility for supervision overall project and progress of the subproject: ***"Repair and Improvement for Safety of Ngoi La 2 Reservoir, Tuyen Quang province"***, including the implementation of environmental protection measures proposed in ESMP.

15. Tuyen Quang irrigation management and exploitation unit takes responsibility for preparing detail bids/tenders information, selecting contractor suitably, preparing contracts and ensuring effective implementation and close supervision of ESMP of project. The contractor takes responsibility implementing project as planned, periodically report to CPO. CPO will associate closely with local authority to ensure

the effectiveness of stakeholder consultation and promote minimized measures effectiveness. Department of Natural Resources and Environment of Tuyen Quang province will bear responsibility of supervising the implementation of environmental policies as per regulated by Vietnam Government. After project completed, the operation organization will take responsibility of maintenance and periodic inspection project's works.

16. ***Budget allocation:*** Both ODA fund and Counterpart fund of Vietnam Government are used for sub-project investment. Total budget estimation is: **59,500,000,000 VNĐ**.

Budget for ESMP implementation including:

- Implementing ESMP: 626,000,000 VND,
- Implementing ESMoP: 453,637,000 VND

PART 1
INTRODUCTION

1.1 GENERAL INFORMATION OF THE PROJECT

Dam Rehabilitation and Safety Improvement Project (WB8) is funded by the World Bank with objectives to support implementation of Safety dam program of Government via improving safety of prioritized dams and reservoirs as well as protecting people and property of community in downstream area. The project is expected to improve safety level of dams and related facilities, as well as safety of people and socio-economic infrastructures of community in downstream areas as defined in Decree No. 72 on dam safety management in Vietnam. Components of the project include:

Component 1: Dam Safety Rehabilitation;

Component 2: Dam Safety Management and Planning;

Component 3: Project Management Support;

Component 4: Disaster Contingency.

The proposed subproject will be implemented in 31 provinces in North region, Central region and high land region. Totally over 400 dams will be selected based on highest priority criteria being agreed to give prioritized interventions to address the risks in context of poverty and inequality.

Estimated implementation time of the project is 6 years – from 12.1.2015 to 1.12.2021. Draft of ESIA of the first year subprojects and Environmental and Social Management Framework (ESMF) will be finalized and announced on 5.12.2015. Environmental assessment for next year subprojects will be based on the report for the first year subprojects and ESMF agreed by GoV and WB.

Ministry of Agriculture and Rural Development (MARD) is generally responsible for project implementation and management. CPO under MARD will provide support for three Ministries to coordinate and monitor overall project. The performance of improvement and repair and preparation for safety dam plan, including protection and trustee, will be decentralized to provincial government. Department of Agriculture and Rural Development (DARD) will be host institution at provincial level. PMU of DARD in each province will be in charge of managing and monitoring dams repair with support from MARD.

The project will support to repair irrigation dams constructed in 1980s and 1990s. Approximately 90% of dams planned to repair are earth dam and small dams with height under 15m, design capacity under 3 million m^3. Investment into complete change of existing structure or building new structure or expanding main structure is not under project magnitude. The main work of the project is to repair and reshape the structure of the main dam, auxiliary dam, reinforce upstream slope with concrete wearing or stone, reinforce or expand size of spillway in order to improve drainage capacity, repair or renovate existing water intake, replace hydraulic lifting system in

the suction (water intake) and spillway outlet, or drill for waterproof in main dam body, improve service roads (reservoir construction, management and operation road).

1.2 APPROACH AND METHODOLOGY FOR ESIA IMPLEMENTATION

ESIA is carried out in accordance with the Law on environmental protection, policy and legal of Government of Vietnam (GoV) and regulations of WB.

1.2.1 Approaches and methodology for social impacts assessment

The purpose of this social assessment (SA), conducted in an integral manner with environmental assessment for this subproject, is two-fold. First, it examined the potential impacts of the subproject –positive and adverse impact –on the basis of planned project activities. Second, its findings inform the design of measures addressing identified potential adverse impact and proposing community development activities that are relevant to the project development goal. For identified adverse impact that could not be avoided, consultation with local people, governmental agencies, project stakeholders, etc., were carried out to ensure affected peoples will be appropriately compensated for, and supported in a manner that their socioeconomic activities will be promptly and fully restored to the pre-project level, at least, and that their livelihoods will not be 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 B4 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 (25 HHs), 4) key informant interview (4 people), and 5) households survey (311 HHs).

A total of 357 of respondents participated in the SA exercise for this subproject, of which 311 people participated in the households' survey (quantitative), and 46 people participate in focus groups discussions, community meetings, and 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 B4 of this ESIA, and the public health intervention plan and public consultation and communication plan were presented at Appendix B2 and B3, respectively).

1.2.2 Approaches and methodology for environmental impacts assessment

- 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 project area. This method is used to set natural, socio-economic condition of the project area.
- Sociological survey method: Taking survey, interviewing affected people (AP), local authority in affected areas and beneficiaries.
- Realistic environment survey method:

- Conducting a survey on realistic environment by field sampling and analysis of indicators in the laboratory to determine the status of surface water quality, groundwater quality and soil quality in the project area and surrounding areas.
- The samples were taken out at location which is shown on the sampling scheme (Appendix A6).
- Air quality is collected from the background environment reports of Tuyen Quang province or from similar projects in the project area in 2014.
- The quality of surface water, ground water were taken by water sampling device as regulated in NTR 6663-6:2008 (ISO 5667-6:2005). Handling and storage of water samples as regulated in NTR 6663-14:2000 (ISO 5667-14:1998);
- Samples of soil, water after taking were preserved and delivered to the standardized laboratory of the Institute for Water and Environment to analyze.

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

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

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

PART 2
SUB-PROJECT DESCRIPTION

2.1 OVERVIEW OF THE SUBPROJECT

a) The subproject "***Repair and Improvement for Safety of Ngoi La 2 Reservoir, Tuyen Quang province***" will be implemented at Trung Mon commune, Yen Son district, adjacent to Tuyen Quang City. The reservoir was built in 1973, the most recent repair and upgrading was in 1999 using budget from Ministry of Water Resources. During the operation time, the headworks have been degraded and damaged reducing the irrigation design capacity and threatening the safety of downstream infrastructure, farms and communities.

b) The objectives of the sub-projects:

- Repairing and improving the dam to ensure the reservoir safety in the context of climate change;
- Ensuring a stable source of irrigation water for the traditional agricultural production, water for aquaculture.

c) Sub-project owner:

- Department of Agriculture and Rural Development, Tuyen Quang Province
- Address: No. 108, Nguyen Van Cu St., Minh Xuan, Tuyen Quang Province
- Phone number: (027) 3822637 Fax: (027) 3822704

d) Total investment budget:

Total investment for the subproject is 59,500,000,000 VND *(Fifty-nine billion, five hundred million Vietnam dong)*

e) Location of the subproject:

The work under the sub-project is conducted at village 1, Trung Mon, Yen Son, Tuyen Quang Province as can be seen in the map below.

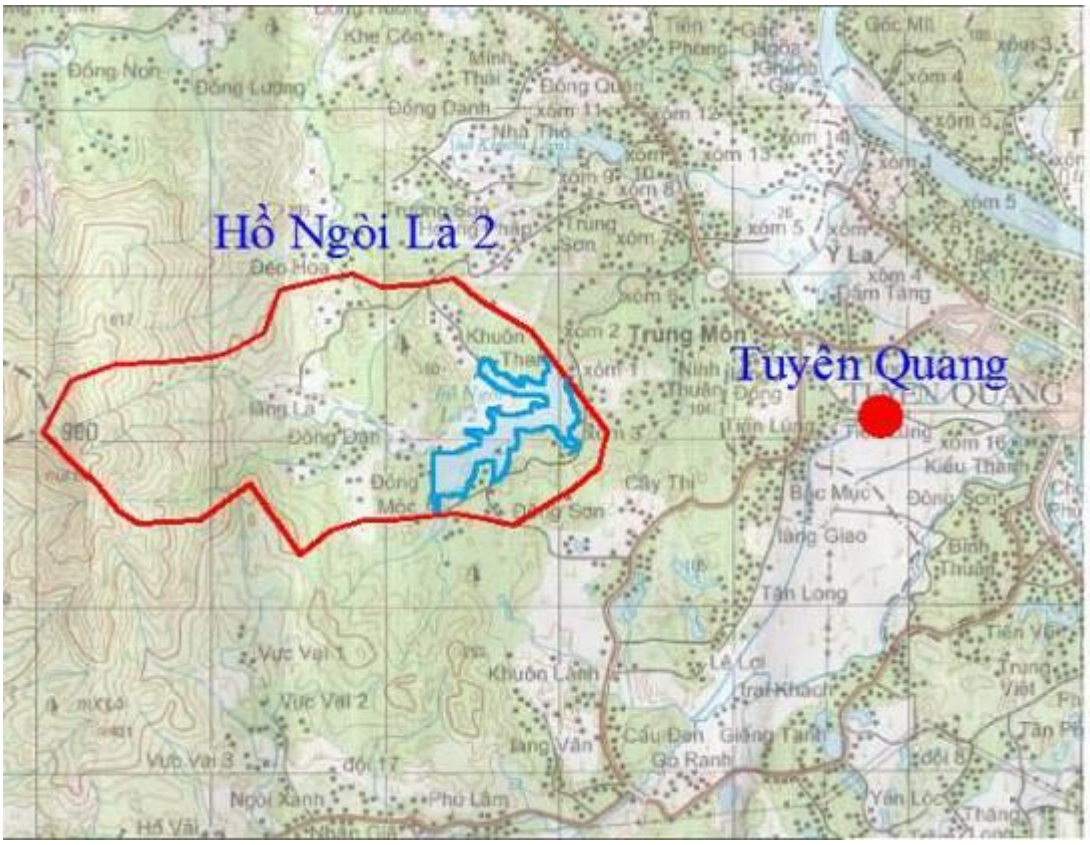


Figure 2 - 1: Location of the subproject

Figure 2 - 2: The site plan of the subproject

2.2. THE PROPOSED SCOPE OF WORK

2.2.1 Current status and volume, scale of items of the work and construction methods.

The subproject consists of the following major rehabilitation works:

- Earth dam: Reinforcing the earth dam upstream slope; Planting grass; Rebuilting the downstream drainage system; Waterproof-grouting some areas within the main dam.
- Water intake: Fixing the flat upper valve to ensure watertight.
- Spillway: Improving the discharge capacity by extending the existing spillway toward the left shoulder of the dam.
- Construction and management road (rescue road): Connecting the right shoulder of the dam to the road toward QK2 shooting practice area, to Ngoi La 1 Reservoir.
- The repairing process of the subprojects does not increase the height of the dam neither increase the storage capacity of the reservoir.
- Volumes and scale of the items and construction methods are summarized in the following table:

Table 2 - 1: Volumes and scales of the items and construction methods

Items	Present Conditions/Configurations	Conditions/Configurations After Rehabilitation
Dam	*Parameters*: Homogeneous earth dam; largest dam height of 15m, length of 556 m. The dam crest at the elevation of 44.8m is covered in asphalt; crest width of 3.5 m; upstream face coefficient: 3; downstream face coefficient: 2.0 to 2.25. *Current status:* <u>Crest of the dam:</u> many positions are peeling forming potholes, or roof slide, the road has been degraded. <u>Upstream slope:</u> many positions are eroded, especially from the upstream water level back down have a serious erosion by waves,	*Parameters:* Homogeneous earth dam; largest dam height of 15m, length 556 m. The dam crest elevation is 44.8m; crest width of 5.0m; upstream face coefficient: 3; downstream face coefficient: 2.5. *Repair and upgrade* <u>Crest of the Dam:</u> Within the permeability, drilling holes from the crest to the foundation, grouting clay, cement and other additives into the hole with enough pressure to allow the liquid fills soil pores, seal the membrane to prevent water infiltration.

Items	Present Conditions/Configurations	Conditions/Configurations After Rehabilitation
	creating deep ditch 70 to 80 cm Downstream: Infiltration occurs in some locations, such as the left shoulder, the floods overflow way when the water level in the reservoir is high. Between the old stream and the right shoulder of the dam (300m from the dead) is having water repellent and stagnant water. All the paved stone, chips and sand for drainage attic under the original design are disappeared. The total length of the segment needed to be waterproof fixed is about 215m, located mostly in the level from 31,0m to 35,9m in the reservoir and from 4,0m to 37,0m in the drain area.	The dam ground: Fill grout and cement and other additive into the bedrock. The upstream face: Fix and prevent erosion and strengthen the roof structure; Remove the plant soil layer, Conduct the surface treatments where exposed to the new added earth layer; Apply the embankment with the parameters of the old roof; Reinforce by paved rock in the concrete frame. The downstream face: Remove the plant soil layer, Conduct the surface treatments where exposed to the new added earth layer Apply the embankment with the parameters of the old roof; Reinforce by paved rock in the concrete frame and plant grass.
Spillway	*Parameters*: The encased concrete has 10cm thick, the width the flood spillway is 5m; The elevation of + 41.5m; Flood flow (1.5%) is 26.52 m^3/s; *Status:* The flood overflow spillway is located at the left shoulder of the dam, followed by a water slope way and energy consumption tank The surface of the spillway and the bottom slopes are covered with reinforced concrete. The spillway's wall was built of stone for a long time ago, the drainage facilities are damaged, forming many seepage along both	*Parameters:* width 17m; elevation + 41.5m; Flood flow (1.5%) 66.9 m^3/s; Structural concrete encased stone 10cm; *Upgrade and repair:* Expanding the spillway 12m toward the left shoulder Retaining the length of water slope in segment 1 Water from Segment 2 is collected toward the energy absorption tank BxH = (10x10) m Structure of all new-built part is made by reinforced concrete M200, 20cm thick, below is the based layer

Items	Present Conditions/Configurations	Conditions/Configurations After Rehabilitation
	sides of the wall. Some areas are peeling. The height of the wall is low, leading to the rocks from two sides fall into the spillway and plants are growing right in the wall. Two sides of the water slope appear many erosion holes and due to surface runoff and seepages.	M100, 10cm thick Dredging and straightening upstream channel, reinforced with stone mortar XM M75 to facilitate the channels and ensure flood drainage. Rebuilding the reinforced concrete bridge over the full length 5.0m width17m
Water intake	*Parameters*: D800mm; the threshold elevation of 33m; designed flow of 0.64 m^3/s; length 55 m *Condition* The open-close equipment is V5 manual machines; The operating doors and repairing door are not watertight, leaking a lot of water.	*Parameters*: D800mm reinforced concrete; the threshold elevation of 33m; designed flow of 0.64 m^3/s; length 55 m *Upgrade and repair:* Drain water will replace the rubber washer in two valves and install the VDD operation machine to replace the old V5 machine.
Road	Parameters: soil road, length L = 1,885m, 3 to 4.5 m foundation width, width of the road is 3m Status: steep, very slippery and difficult to walk during rainy season	*Parameters:* Concrete road, length L = 1,885m, 6 m foundation width of the road, pavement width of 3.5 m *Upgrade and repair* The road is repaired, upgrade to concrete and reduce the slope

Figure 2 - 3: The crest of the dam is peeling from the middle view

Figure 2 - 4: The crest of the dam is sliding in the left shoulder

Figure 2 - 5: Sliding in the upstream slope of the dam

Figure 2 - 6: Infiltration in the right shoulder

Figure 2 - 7: Infiltration in the downstream of the dam

Figure 2 - 8: Current status of the downstream slope of the dam

Figure 2 - 9: Intake gate valve

Figure 2 - 10: The bridge over the spillway.

2.2.2 The volume of construction works and transportation of soil, rock and building materials

Table 2 - 2: Estimated transportation stone and construction materials activities

Items	Location	Quantity (exploring capacity)	Distance to construction site, transport routes
Borrow pits	Do not use land mine because the volume excavated from expanding the spillway is enough.		
Quarry	Nhu Khe quarry	Not identified	25 km
Disposal site	Village no. 3, Trung Mon village	50,000m^3	2.5km
Construction materials supply	Tuyen Quang City	Buy from agents, unlimited	7 km
Material yards	Downstream of the dam, location 1, Trung Mon village	1,300 m^2	200m
Construction site	Location 1, Trung Mon village	1,000 m^2	100m

Table 2 - 3: Majors construction volume

No.	Items	Unit	Volume
I	**Land construction**		
1	Peel the land cover layer	m^3	3,363
2	Excavated soil	m^3	47,677
3	Filled soil	m^3	9,501
4	Demolition volume	m^3	247.82
II	**Construction and installation work**		
4	Gravel	m^3	1,864.89
5	Sand	m^3	1,995.85
6	Rocks	m^3	8,334.70
7	Concrete	m^3	1,409.32
8	Steel	Kg	33,223.26
Total		**139,839**	

According to calculations, the excavated volume of soil from expanding the spillways to the left shoulder and layered excavation is 44,314 m^3, the embankment volume needed for the project is 9,501 m^3. Construction is not required mining embankment by fully utilizing the excavated soil.

Thus, the project will need to move about 34.813m^3 of soil. Surplus excavated soil, the organic layer removal and waste materials are dumped in disposal site which has reserves of about 50,000m^3. The disposal site is located in a lowland area, one site faces to the commune way to the shooting practice area, and three other sites are acacia hills. At this time, the disposal site has only shrubs, there is no public construction around. The area is currently managed by Trung Mon CPC, the CPC handed over to Reservoir's Management Board, the Reservoir's Management Board expects to level and plant eucalyptus or cheaper on the disposal area after the completion of the project. (There is a Memorandum of Agreement with the Trung Mon CPC).

Figure 2 - 11: Disposal site area

The other constructing materials were purchased from the city center of Tuyen Quang, the transport distance is from 7 to15km.

2.2.3 List of workers, machinery, and equipment for construction

The preparation stage of land clearance needs 20-30 workers in the short term (1 month). The number of workers in the construction site in the peak construction time is about 50 people.

Table 2 - 4: The list is expected machinery, and equipment for construction

No.	Name	Quantity
1	Bulldozer 110 CV	2
2	Excavator 1,6m^3	3
3	Dump truck 7 ÷10 T	5
4	250 liter mixer	3
5	Concrete compactors	10
6	100 KVA generator	2
7	Water pump 120 m^3/h	2

2.3 THE CONSTRUCTION SCHEDULE

The total implementing time of the sub-project is 18 months. The expected time for land clearance and compensation is the first 3 months. The estimated time to complete the rest of the work and handover the ground is in the last 3 months.

Discharge water through the main spillway in rainy season, no storing water, and maintain the water level in the lake below + 37.5m in the beginning of the first construction month.

Construction of the water intake: expected within 2 months (from March to before April 30th in the first year), during this time, the water intake temporarily stop working. So that water supply for the crop season from May to August is not affected due to the construction of the water intake.

Construction of dam and spillway are implemented in the period of 15 months. In the first year, the dam will be constructed to the normal water level of + 41.5m. The construction of water intake, dam and spillway will not affect the water supply for production.

Table 2 - 5: Expected construction schedule

No.	Construction categories	1. year				2. year		
		Q1	Q2	Q3	Q4	Q5	Q6	Q7
1	Site clearance and compensation							
2	Water intake							
3	Dam							
4	Spillway							
5	Management road							

PART 3
POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

Project Repair and improvement for safety of Ngoi La 2 reservoir, Tuyen Quang province will not affect to ethnic minority. No natural forest, reservation area, wet land and rare and precious animal and plant species in the project area is found. Impacts of the project mainly relate to natural environment due to activities during construction such as earth work, repairing work items, material and waste transportation, etc. and some impacts on social environment due to temporary and permanent land acquisition of 12 households. Policy framework, institution and regulation applied in ESIA of the project include:

3.1 Applicable National Law and Regulations

a) Policy framework on environmental assessment

Law on environmental protection (2014) has defined the issues relating to strategic environmental assessment, environmental impact assessment and environmental protection commitments for development activities. Development of environmental impact assessment report is carried out simultaneously with the process of setting up an investment project (feasibility study report). Time of making, appraisal and approval of reports are specified in detail in Item 2 of Article no. 13 of Decree no. 21/2011/ND-CP. Environmental screening (type of environmental assessment for the project) is done according to the list of project types in Annex 2 of the Decree no. 18/2015/ND-CP.

Environmental assessment. In Chapter 4 of Decree No. 18/2015/ND-CP dated 14/02/2015, from Article 12 to Article 17 specifies the formulation, evaluation and approval of environmental impact assessment reports and the implementation of projects and measures to protect the environment before the official operation of the project and operational phases of the project. Article 12 of this Decree defines that during the implementation process of environmental impact assessment, project owners must conduct consultation meeting with People's Committees of communes, wards and townships (collectively CPC) where project will be carried out, organizations and communities directly affected by the project; study, receive objective opinions and right proposals of the consulted stakeholders in order to minimize the adverse impact of the project on natural environment, biodiversity and community health . Annex 2 of the Decree states that Environmental Impact Assessment must be done for the project to build reservoirs with the capacity of 100,000m^3 and more.

Environmental protection plan. Chapter 5 of Decree No. 18/2015/ND-CP dated 02/14/2015, from Articles 18 and 19 defines the object to develop environmental protection plan is new investment projects. Projects to invest into expanding the scale, increasing the capacity of the production, business and services agencies are not subject to develop environmental impact assessment Report specified in Annex II of this Decree.

According to regulations of GoV, the project "Repair and improvement for safety of Ngoi La 2 reservoir" will be performed report Environment Impact Assessment.

b) Policy framework for dam safety

Decree No. 72/ND-CP dated 05/07/2007 of GoV on dams safety management in Vietnam has defined construction, management and ensuring safety of the dams. According to this Decree, large dams are dams with height from 15 and or capacity of reservoir from 3 mil. m^3 or more; medium dams are dams with height from 10m to 15 m or capacity of reservoir from 1 to 3 mil. m^3 and small dams are dams with height from 5 to 10 m or capacity of reservoir from 50,00 to 1 mil. m^3. According to this decree, the dam owner should have plan to operate the reservoir, sluices and related works, inspect and monitor dam safety and hydrological conditions, maintain and protect the dam, rescue dam, report dam safety, implement flood protection for downstream areas. All plans must be taken seriously. MARD is responsible for state management of dam safety. Water resources department under MARD is responsible for performing the function of dam safety management in the country. Ministry of Industry and Trade is responsible for State management of hydroelectric dams. PPCs are responsible for State management of reservoirs in the province. PPCs assign DARD to implement this function.

c) Policy framework related to land acquisition and resettlement

Land Law no. 45/2013/QH13 takes effect from 07/01/2014 and the decrees relating to land acquisition, compensation and resettlement applied in Vietnam and the provisions of the cities/provinces constitute the legal framework confirms the right of citizens on the land use rights and assets attached to land, land classification, land use origin, legal nature and legitimacy, classification of compensation and support types, regulations on land acquisition, compensation and resettlement, safety requirements for safety corridors of dam, reservoirs, irrigation works.

3.2 World Bank Safeguards policies triggered

The provisions on environmental protection of WB are given in form of operational policies (OPs), which includes 10 policies, from which important policy relating to the environment is OP 4:01 on environmental assessment. Here is a summary of the WB's policy related to the sub-project:

Table 3 - 1: Environmental safety policies of the WB related to the project

Name	Objectives
OP 4.01 Environmental assessment	• Ensure that the proposed project is sustainable and ensure environmentally and socially. • Provide for the decision makers information about the potential risks of environmental and social issues associated with the project. • Increase transparency and participation of affected people in the decision-making process.
OP 4.37 Safety of Dams	The essential problem for the safety of dams in: • The projects involve in construction of new dams • The project may be affected by safety factors of operating an existing dam or dams under construction

	• The other important issues: dam height, reservoir capacity, suitability of safety standards
OP 4.12 Involuntary Resettlement	• Avoid or reduce compulsory resettlement and the influence on economic activities, including loss of livelihoods • Provide transparent compensation procedures in the compulsory acquisition process of land and other assets • Provide adequately for people resettled new investment resources and opportunities to benefit from the project (implemented through resettlement plan) • Restore and improve the living conditions of people affected by the project • Compensation for affected people at replacement cost. The resettlement planning and mitigation measures should be taken on the basis of consultation with those affected and by the participatory approach.

PART 4 ENVIRONMENT AND SOCIO-ECONOMIC CHARACTERISTIC OF THE PROJECT AREA

4.1 PHYSICAL CONDITION

4.1.1 Natural conditions

Tuyen Quang province

Tuyen Quang is a mountainous province in Northern Vietnam. Northwestern and northeastern Tuyen Quang borders with Ha Giang province. The Northwest borders with Bac Kan, Cao Bang and Thai Nguyen provinces. The South borders with Phu Tho and Vinh Phuc provinces. It is about 160km from Hanoi. There are 7 districts of Tuyen Quang province, including Tuyen Quang city (Political and cultural center of Tuyen Quang province) and 6 districts namely Chiem Hoa, Ham Yen, Na Hang, Son Duong Lam and Yen Son.

Land resources: area of cultivated land of Tuyen Quang province is 5,870 km^2, accounting for 1.8% of the natural area. Forestland is accounting for 70% and arable land accounting for 8%. The quite fertile land of Tuyen Quang is suitable for agriculture and agro-forestry production.

Yen Son district

Yen Son district located in Southern Tuyen Quang province surrounding Tuyen Quang city. The Northwestern Yen Son district borders with Doan Hung district of Phu Tho province, The Western borders with Yen Binh district of Yen Bai province, the East borders with Dinh Hoa district of Thai Nguyen province and Cho Don district of Bac Kan province. Yen Son is the most populated residents and largest natural area of Tuyen Quang province, with about 1,210km^2 of natural area and 167,000 habitants.

Trung Mon commune

Trung Mon commune is about 7km in the south of Yen Son district and 7km in the north of Tuyen Quang city. It borders with Tuyen Quang city and Chan Son, Kim Phu, Lang Quan, Thang Quan communes of Yen Son district.

4.1.1.1 Climate and meteorology

Tuyen Quang has characteristics of tropical monsoon climate similarly with climate in Northern Vietnam with two relative distinct seasons: Summer is hot, humid and rainy. It's rarely appearing dry-hot western wind; winter is cold with drizzle.

The tropical monsoon feature is determined by the factors of geographical location, size and terrain territory of the province. This feature is reflected in the specific data on the average sunshine hours, humidity, rainfall and temperature annually through the observation at Ham Yen and Tuyen Quang meteorological stations.

The maximum air temperature appears in the months VI, VII, VIII; the minimum is in the months XII, I, II.

The relative humidity of the air in the project area is high. The average monthly humidity is over 80%.

The average sunshine hours annually are from 1,350 to 1,500. From May to July in summer are the sunniest months of the year. The lowest sunshine hour months are February and December.

The study area is located in the tropical monsoon climate region. The total annual rainfall ranges from 1,400-1,800mm. It is mainly concentrated in flood season, accounting for 70-80 % of total annual rainfall. The average rainfall of different rainfall stations are quite evenly.

The rainy season lasts in five months, from May to October, in which June, July, August are normally heavy rainfall months. It's accounted for around 50-55% of the total annual rainfall.

The dry season lasts in 5 months, from November to March next year, coinciding with the dry northeast wind. The rainfall in dry season is only about 8-12% of the annual rainfall, mainly in February, March.

Tuyen Quang and Ghenh Ga rainfall stations are selected to calculate the annual typical rainfall and flood in Ngoi La reservoir basin. Monthly and yearly rainfall of stations in the study area is calculated as follows:

Table 4 - 1: Monthly and yearly rainfall of stations in study area

Stations	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual rainfall
Chiem Hoa	26.6	31.4	53.3	123.9	231.1	285.0	289.4	290.6	158.7	97.7	43.7	22.1	1653.4
Ghenh Ga	24.8	35.1	58.5	105.2	219.9	252.2	311.1	263.0	146.3	87.4	34.6	16.8	1554.8
Tuyen Quang	23.9	28.9	52.9	113.7	226.8	251.8	292.4	294.8	178.6	115.5	46.0	17.3	1642.5

The average annually rainfall of Ngoi La 2 is calculated based on the rainfall data of meteorology stations: X_0 = 1,598.7mm.

The rain-flood of Ngoi La 2 reservoir is calculated based on the rainfall data of the meteorology stations located near to the construction site and showing the characteristics of the rain-flood in study area. Results calculated are as follows:

Table 4 - 2: Rain-flood with different frequencies

Name of reservoir	Xo	Cv	Cs	0.01%	0.1%	0.2%	0.5%	1.0%	1.5%	2.0%
Ngoi La 2	128.5	0.42	1.68	533.0	424.1	391.1	347.2	313.7	294.0	280.0

4.1.1.2 Natural disaster

Flooding: Floods are frequent in Tuyen Quang province affecting local property and people. For example, the storm No.6 named MANGKHUT caused the moderate

and heavy rain in the whole province. The rainfall is from 50-100mm caused the flooding on Lo River and Gam River.

Drought: Water shortage is occurring annually in the small rivers of Yen Son district affecting to the water supply for the economic sectors in the dry season. Drought and water shortage in the winter-spring season have occurred widely and lasted for several months recently, however, it is not severe as occurred as in previous years. The average water levels in dry season in rivers are lower than annual water level. According to the statistics of the past 30 years, the lowest water level in Lo river of Tuyen Quang is 15.32 m, the third lowest value of monitoring data recorded at the same period. The average crop yield recorded has been decreased by 20% due to drought.

Damaging cold: Four damaging cold spells occurred in Tuyen Quang province in Winter-Spring of 2013-2014 with 38 days totally. The first appeared earlier than the average lasting 19 days (from the date 12/15/2013 to 02/01/2014). The average temperatures in the winter-spring of 2013-2014 in Tuyen Quang province was approximately the average of many years.

Hurricanes: Hurricanes with hail occurred in some communes of Yen Son district. This is the kind of frequent natural disasters caused the instable agricultural production.

Landslide: Landslide is also frequent in Tuyen Quang province. Landslides and erosion of the road talus causing the traffic jam, houses and hydraulic construction buried.

4.1.1.3 Topography

The study area is characterized by the general topography of Tuyen Quang province as mountains, midlands and plains interspersed.

The reservoir basin is belong to the eastern slope of La mountain (+ 860m of altitude), and from +200m to +50,0m of lower altitude. The main slope is from west to east. The sub-slope is from southwest to northeast towards the downstream of La stream; the northwest - southeast direction of Ngoi Cha is the main drainage direction of the basin.

There is no difference in altitude of irrigation area generally. It's between +20.0m to +28.0m. However, the surface is alternated high hills and influencing of rapid urbanization.

The water is drained along the natural trench following the slope of the terrain around the construction area.

4.1.1.4 Geology

To assess the geological conditions at the construction site of the dam, three drilled holes were conducted, of which 01 hole at the dam face, 01 hole at the downstream berm, 01 hole at the toe of downstream dam. The results of drilling and testing of samples were used for the drawing of the geological section of head-works with the depth of 14.0m and the division of the soil layers from top to bottom as follows:

Layer 1: Gravel.

This layer distributed on the surface of the dam is gravel, which has average thickness from 0.1 to 0.3m.

Layer 2: Clay with brown-grey grit; yellow-grey grit, half-solid state.

This layer is distributed beneath layer 1 at the surface of dam and the top of upstream berm dam. This layer is found in all three drilled holes named HK1, HK2 and HK3 with the thickness from 2.5m (HK3) to 10.7m (HK1). The results of permeability field experiment is $K = 3.57x10^{-4}$ cm/s.

This is layer of materials that can be good for construction. It has medium load-bearing capacity and compressibility subsidence, and weak permeability layer. Therefore, it is not affected to the water storage capacity of the reservoir.

Layer 3: White-grey coarse sand, light state.

This layer is under layer 2. It's only found in HK3 with thickness of 1.8m. The results of permeability field experiment is $K = 9.81x10^{-5}$ cm/s. As the TOR requirements, the sample should not be taken for analysis. The result of the site infiltration experiment showed the average permeability layer is from the medium to high affecting to the overall permeability of the dam.

Layer 4: Loam mixed with gray and white, gray-yellow, yellow-brown, from soft plastic to hard plastic states, some hard plastic sandwiched yellow gray sand.

This layer is distributed under layer 2 at the dam line and dam berm and under layer 3 at the toe of downstream dam. This layer is found in all three drilled holes named HK1, HK2, and HK3 with unidentified thickness. Altitude of layer 4 is from +28,36 (HK3) to +33.89m (HK1). The results of permeability field experiment is $K = 2.58x10^{-5}$ cm/s.

This is good constructive layer. The load capacity and compression subsidence are medium, and weak permeability layer which will not affect to the water storage capacity of the reservoir.

4.1.2 Water environment

To assess the current status of baseline environment quality in the project area, the ESIA consultant took three samples of surface water, three samples of groundwater, and three samples of soil to evaluate biological, physical and chemical criteria.

Table 4 - 3: Baseline environment sample location

Sampling surface water location	Sampling ground water location	Sampling soil location
1. Sample NM1 at upstream reservoir - Trung Mon commune; coordinate $22^0$30' 22" and $104^0$27'51"	1. Sample NN1 at the house of Mr. Hanh, hamlet 3, Trung Mon commune; coordinate 22030' 32"B and 104027'41"	1. Sample Đ1 at upstream reservoir; coordinate $22^0$30'22" and $104^0$27'51"

2. Sample NM 2 at downstream reservoir - Trung Mon commune; coordinate 22030' 25"B and 104027'57"	2. Sample NN2 at Ms. Mai's house, hamlet 3, Trung Mon commune; coordinate $22^0$30'32" and $104^0$27'41"	2. Sample Đ2 at the spillway; coordinate $22^0$30'25" and $104^0$27'57"
3. Sample NM3 at middle of dam, Trung Mon commune; coordinate $22^0$30'54" and $103^0$21'45"	3. Sample NN3 at people committee office of Trung Mon commune; coordinate $22^0$31'12" and $104^0$27'40"	3. Sample Đ3 soil at hill in downstream reservoir; coordinate 22031' 12"B and 104027'40"

Surface water:

Almost people who live in Trung Mon commune are used tap water for domestic use.

The water resources for agricultural production activities in project area are mainly taken from Ngoi La 2 reservoir. In addition, this reservoir is supplying water for 15ha of aquaculture production. The areas are irrigated under Ngoi La irrigation system as following:

Table 4 - 4: The real irrigation area of communes, wards in project area

No	Commune/Ward	Total	Irrigation area (ha)				
			Spring crop	Winter crop	Spring vegetable	Winter vegetable	Aquaculture
1	Tan Ha commune	188.172	87.545	87.545	2.941	2.941	7.199
2	Y La ward	222.20	109.157	109.157	1.728	1.728	0.431
3	Trung Mon	110.399	52.237	52.237			5.926
4	Kim Phu	181.504	90.752	90.752			
5	Hung Thanh	7.490	3.745	3.745			
6	Tan Trao University (Y La	6.434	2.697	2.697			1.040
	Total	716.199	346.133	346.133	4.669	4.669	14.596

Ngoi La irrigation system is located in Yen Son commune region and a part of Tuyen Quang district, including 02 irrigation systems, namely Ngoi La 1 and Ngoi La 2.

Both Ngoi La 1 and Ngoi La 2 reservoirs are managed by Ngoi La irrigation management team, under directly Tuyen Quang Irrigation Management Board.

The detailed results of surface water analysis are showed in Appendix 2.

The physical and chemical criteria (BOD_5, NO_2^-, NO_3^-, PO_4^{3-}, SO_4^{2-}) and heavy metal (As, Pb, Cd, Fe) of surface water are all below the allowed limitation in NTR 08:2008/BTNMT, column B1 – water quality for irrigation, drainage and aquaculture.

Comparing to the above water quality analysis to NTR 39:2011/BTNMT – National Technical Standards on water quality for irrigation, all criteria such as: pH, DO, SO_4^{2-}, As and Cd are below the allowed limitation, ensuring quality for irrigation.

Almost project areas are in rural, there are nearly no industrial production activities; the main waste sources are from agricultural production and livestock activities. However, these waste sources are not insignificantly, water environment water quality in project area is quite good. It can be used for irrigation or other purposes which have the same water quality requirement.

Ground water quality

According to geological survey, ground water is contained in gravelly soil layer and gravel layer. At the present, there is only small part of household (<5%) using ground water for domestic use, and using tap water for eating and drinking.

The detail results of ground water analysis are shown in Appendix 2.

Assessment ground water quality from three sample analyzed shows that the most criteria are in the allowed limitation, excepting COD and Fe criteria. COD is from 2.5-4.5 times higher than the standard and Fe is from 25-4.6 times higher than the standard. These show that ground water in project area is polluting contamination.

4.1.3 Air environmental quality

In the project area, the dust is mainly from agricultural production activities, and transportation. However, transportation facilities are mainly cart vehicles and motorcycles. Therefore, the air environment in project area is still good.

4.1.4 Soil environment

According to data from the current land status in 2014, the total natural area of Ngoi La 2 reservoir project is 4,473 ha. The details are in following table:

Table 4 - 5: The natural area of communes/wards in project area

No.	Commune/Ward	Natural area (ha)	District/City
1	Trung Mon	1,184	Yen Son
2	Kim Phu	1,935	Yen Son
3	Y La	350	Tuyen Quang City
4	Tan Ha	524	Tuyen Quang City
5	Hung Thanh	480	Tuyen Quang City

The unused land is 230.3 ha, accounting for 4.2% of total natural area. Of which 14.6ha of unused hill land and rock land without forest, and 6.3 ha of unused flat land. In the future, to develop infrastructure, transportation, industry, residential area, and non - agricultural zones, the used-land must be taken from current agricultural land.

The detailed results of soil sample analysis are shown in Appendix A6.

The analysis criteria of soil samples are compared with NTR 03:2008/BTNMT – National technical standards for soil quality.

The results of soil sample analysis in the project area are shown that no sign of pollution by heavy metal. The criteria of heavy mental is very low comparing with allowed limitation.

4.2 BIOLOGY ENVIRONMENT

Flora

Forestry land area of Trung Mon commune is of 275 ha, in which:

+Land with natural forest for production: 0.6ha;

+ Land for production forest: 266.87 ha;

+ Land for restoration of production forest: 7,53ha;

The plants are relatively diverse. The forests are growing and development normally with a number of key species: sienna, teak, etc. However, there is vegetation of artificial forest around Ngoi La reservoir. The species composition are mainly trees planted by local people such as eucalyptus, acacia, sometimes mixed with shrubs, grass and some fruit trees such as mango, jackfruit, lemon, guava .... Most of them are new planted trees with small tree-trunk and low value, less than 10 cm of diameter and less than 5.0m of height. Natural vegetation cover is only the low grass or herbaceous groups. Poor vegetation cover with no economic value.

There is no valuable plant need to be conserved.

Fauna

Through field survey and interviewing local people, there are no more rare animals in project area such as tigers, leopard, porcupine, python, antelope, bear, porcupine, but sometimes facing with reptiles (snakes), amphibians (frogs, imitation), rodents (rats, porcupines).

The mainly terrestrial animals are birds such as warblers, finches, hummingbirds, etc. There are also a number of other species such as mice, reptiles (coluber, water snake), amphibians (frogs copper, sharp parody), and the breeding animals such as cattle, pigs, chicken, etc.

The natural fish: It's found during the field survey that there still existed the high economic value species previously such as turtles. However, due to change in land use structure in recent years, these species have been rarely occurred. There are currently only shrimp, crabs, gobies, mud carp, carp, amur, etc. in the reservoir which are low economic value species, popular feeding and fishing.

The feeding fish species: In the reservoir foundation area, the local people have dug the ponds for feeding fish. The mainly species feed are mud carp, unisexual tilapia, carp, etc.

There are no valuable animal stated in red book that should be conserved within project area.

Tuyen Quang department of aquaculture is implementing test of fish cage in the reservoir. The test will be completed in November 2015.

4.3 ECONOMIC-SOCIAL AND CULTURAL ENVIRONMENT

4.3.1 Population

The total population of Tuyen Quang province is 746,669 inhabitants, by gender: 373,741 of male, accounting for 50.05%, and 392,928 of female, accounting for 49.95%. The population in rural areas is 647,976 inhabitants, accounting for 86.78%; and 98,693 people in urban area, accounting for 13.22%. The average population density is 127 people/km^2.

The working age population by the end of 2013 is 479,076 inhabitants, accounting for 64.16% of the total population. The mainly laborers are working in agricultural production, accounting for 88.04%, only 11.96% of laborers are working in industrial and other sectors.

The total households by the end of 2014 are 197,251 households, in which, 25,814 poor households (13.09%), and 31,312 nearly-poor households (15.87%).

There are currently 22 ethnic groups living in Tuyen Quang province, of which over 50% are ethnic minorities with primarily agricultural economy. This is a particular point need to be considered in the implementation of economic - social policies, especially for the remote and ethnic policies.

At the surveyed project communes, the average members of a household in the samples surveyed are 3.7 people, lower than 3.89 people of the average household demography national wide (Statistic yearbook, 2013). The average number of household members of each household is different between different commune, ethnic groups, income groups, groups of headed women households and headed men households.

The population of Trung Mon commune is 7,914 inhabitants distributed in 2,918 households. Some characteristics of the population and labor distribution in the economic sectors within the sub-project area are presented in the following table:

Table 4 - 6: Characteristics of local population in sub-project area

Item	**Unit**	**Value**
Household	Household	2,198
Population	People	7,914
Male		4,125
Female		3,789
Size of household	People	3.6
Population density	people/km^2	6.62
Ethnic minority household	household	109
% ethnic minority	%	5
Poor household	Household	44
% Poor household	%	2.5
Average income	Million dong/people/year	9.90

Item	Unit	Value
Farmer	%	60.08
The economic structure		
- Agriculture	%	60.08
- Industry, handicraft	%	34.2
- Service	%	5.00

Source: SIA Report, 3/2015

4.3.2 Socio-economy

4.3.2.1 General view of socio-economic condition in project area

Tuyen Quang province

The socio-economic development of Tuyen Quang province has been high worth achievement and relatively stable recently. The average growth rate of GDP is over 12% annually, reaching 15.52% in 2014. GDP per capita at current prices reached 25 million VND per person per year. The economic structure has been shifted towards increasing the proportion of industry and services, decreasing the proportion of agriculture and forestry sectors. In 2005, the proportion of industry and construction is 30.7%, service 33.6%, and agriculture, forestry and fisheries: 35.7%. By 2015, the province's plan will be to increase the proportion of industry - construction up to 38% of the provincial economy structure. The industrial production growth rate will be maintained; the agriculture and forestry will continue to shift towards the production of goods, some crops planted with high economic value; development of the service sector stability.

The provincial poverty rate in 2014 was 13.09% (decrease 4.84% compared with 2013). The poor household lives relying on only a crop season per year, only rice or corn plantation. They do not have enough money for breeding. Usually, those are lonely, elderly or disable. Their planting land is ineligible to cultivate high – value crops.

Yen Son district

Yen Son is a largest natural area and biggest population district of Tuyen Quang province, with 1,210 km ^{2} of total natural area and 167,000 inhabitants.

The forestry area is 87,780.81 ha, accounting for 72.6% of natural area. This is good condition for agriculture and forestry development.

The natural conditions of Yen Son are suitable for feeding poultry and livestock as pig and cow. Soil condition is suitable to grow materials forest such as bamboo, tea, rice, bean, sugar crane, fruit tree, etc., especially Gac fruit tree in Trung Mon, Lang Quan, and Tu Quan communes.

The strengthen of Yen Son district is to develop the industrial sectors such as: agricultural – forest products processing, manufacturing of construction materials,

mining and mineral processing, forest exploitation such as wood, bamboo, Neohouzeaua.

The economic structure of the Yen Son district has been gradually shifted towards increasing the rate of industry and services. In 2010, the industry – handicraft were accounted for 43%, agriculture - forestry were accounted for 30%, and services was accounted for 27%.

GDP growth rate increases by 13.7% annually. Some industrial sectors have the development advantages such as agricultural – forest product-processing, manufacturing of construction materials, mining and mineral processing. The agriculture - forestry economic has been developed towards the concentration of fast development of infrastructure and tourism - services, and investment attraction.

4.3.2.2 The social-economic condition of people at sub-project area, Trung Mon commune

a) The social-economic condition:

Trung Mon commune locates near Tuyen Quang city. Therefore, the income of local people from agricultural production is only 60.08%; other 34.2% is from industry and handicraft. The main income of people is from agriculture, forestry and handicraft. The main agricultural activities are rice cultivation and other agricultural production and breeding. The average income is around 4.2 million VND per people per year (about 350,000VND per month).

Percentage of households with agriculture-forestry-fishery production of Kinh people is lower than other ethnic minorities (44.4% vs. 65.9%). Contrastingly, the proportion of non-agricultural households of Kinh people is higher other ethnic minorities (2.1% vs. 0.9%). In terms of current occupational status contributing to the household income, the survey showed that the proportion of dependent people is quite high, about 35.1%, mainly unemployed workers and underemployed.

Demographics:

The average members of a household in the samples surveyed are 3.7 people, lower than 3.89 people of the average household demography national wide (Statistic yearbook, 2013). There are different between communes, ethnic groups, income groups, groups of headed women households and headed men households.

Table 4 - 7: Average member and labor in a household

		Size of household (%)			
	Average member of a household	1-2 people	3-4 people	5-8 people	9 people and more
Total	**3.7**	**38.2**	**47.0**	**14.8**	**0.0**
Commune/ward					
Y La ward	3.8	36.5	46.2	17.3	0.0
Tan Ha ward	3.5	47.5	45.0	7.5	0.0

Trung Mon commune	3.6	40.4	42.1	17.5	0.0
Kim Phu commune	3.9	37.9	40.5	7.7	0.0
Hung Thanh ward	3.7	37.9	54.5	7.6	0.0
Group of income					
Group 1 (poorest)		42.1	31.6	26.3	0.0
Group 2		11.6	53.8	34.6	0.0
Group		20.0	40.9	39.1	0.0
Group 4		8.7	44.7	44.7	0.0
Group 5 (richest)		10.3	53.3	35.5	0.0

Source: SIA report, 3/2015

By income group, it should be noted that the poor and nearly-poor groups (groups 1 and 2) have a lower rate of demographic scale, family with more 5 people, group 1 (26.3%) and group 2 (34.6%). It was pointed out that if as a decade ago, large family size with many children is one of the main causes of poverty, but now if there is, it is only a secondary cause; the actual proportion of third child family became less than before.

Analysis of the structure of household scale surveyed in subproject area showed that a majority of 3-4 person households (47.0%) and 1-2 (38.2%); fewer 7-8 person households (14.8%) and no 9-person household. If you recognize that today in Vietnam, small family size with fewer children is popular, so in this survey showed that the core family model is approximately 85.2%.

Thus, the survey data showed that compared with the general situation in the subproject area, the rate of small and core families are still higher, indicating the development level of subproject area is higher than the other communes in province.

Occupational structure

The occupational structure of the family members in terms of involving in labor and income of the samples surveyed in subproject area, the agro-forestry-fishery sector are ranked as the highest rate, accounting for 46.1%; The second is pupil and student, accounting for 19.8%; the remaining is staff-officers, employees, workers with low rates of less than 10% each; The percentage of business man and services, handicraft and housewives are particularly low, less than 1.4%. Thus, agriculture-forestry-fishery sector is the key of the social-economic development in the sub-project area. This also concentrates the majority of the workforce.

Table 4 - 8: The main occupation of the laborer (included all household laborers)

	Incapacitation	**Agriculture-forestry-fishery**	**Trading services**	**staff-officers**	**Pupil - student**	**Handicraft**	**Hired labor**	**Unemployed**	**None**	**Other**
Total	**4.2**	**46.1**	**1.4**	**6.9**	**19.8**	**0.5**	**4.9**	**4.0**	**7.1**	**5.2**

Commune										
Y La ward	2.4	44.3	4.2	6.1	17.5	0.9	5.2	9.0	6.1	4.2
Tan Ha ward	3.8	48.9	0.5	4.3	16.3	1.6	2.7	7.6	11.4	2.7
Trung Mon commune	2.4	61.8	0.4	3.6	17.3	0.0	3.2	1.6	9.2	0.4
Kim Phu commune	4.1	40.5	1.6	9.5	21.6	0.3	5.9	1.9	5.4	9.1
Hung Thanh ward	6.9	41.7	0.4	9.1	19.9	0.0	6.2	3.3	6.9	5.8
Ethnic group										

Source: SIA report, 3/2015

In terms of current occupational status contributing to the household income, the survey showed that the proportion of dependent people is quite high, about 35.1%, mainly unemployed workers and underemployed. The independents are mainly pupils, students, juvenile and old people, incapacitation and unemployed. The project implemented will increase the irrigated area, additional season produced in a year, diversifying water-used sectors besides of the crop plantation such as breeding, services and others; thereby increasing jobs and eliminating the current unemployment and underemployment in the subproject area. On the other hand, it will have significant negative impacts on the livelihoods of relatively stable households who recovered their land in case of ineffective implementation of the mitigation measures as design; construction and reasonable compensation to help the affected people can buy replacement land or change a new job.

Table 4 - 9: Current land use of Trung Mon commune

Item	**Unit**	**Trung Mon commune**
Total natural area	Ha	1,195.06
Agricultural area	Ha	868.95
Forest area	Ha	275
Unused land	Ha	32.336

Information of AH: The sub-project implemented will affect to 12 households with 57 members of village 1, Trung Mon commune. The interview was conducted with these 12 households. There is a woman headed household out of the 12 affected households. Each household has 3 to 7 members.

Table 4 - 10: Affected household (AH)

No.	**Information**	**Unit**	**People**
I	Householder	Household	

1	Male	Household	11
	Female	Household	01
II	Size of household		
1	Medium	People	4.75
2	Lowest	People	3
3	Highest	People	7

Source: SIA report, 3/2015

All AHs are Kinh people.

The major income of the affected households is from agricultural activities. Some other income sources are from livestock and poultry (chickens, cattle) and trade activities. The lowest income per capita per month is from 825,000 VND to 1,920,000 VND.

The labor distribution of the households is: both men and women engaged in agriculture production; women are in charge of the house works such as cooking, children care, house cleaning, and other household chores. While men only help housecleaning, both men and women have the right to make decisions and participate in the family and community meetings.

Vulnerable household: There is 01 vulnerable household affected by the subproject.

b) Characteristics of water use and irrigation management

Characteristics of water use

The reservoir was designed as the year-regulation. Annually, the reservoir storages water during rainy season reached the retention level ensuring the required storage capacity. In dry season, water is supplied as requirements, and the dead level will be reached by the end of the dry season.

Water for agriculture production will be taken from the water intake and distributed to the water users through the distribution channels.

The valve of water intake is opened appropriately with the reservoir water level and flow requirements in each time period to save water.

Characteristics of irrigation management

Based on the water-use requirements of water users through water supply contract, the Ngoi La irrigation management team will make plan to supply water for irrigation reasonably for agricultural production, to ensure compliance the agreements with organizations and individuals using water from Ngoi La reservoir.

The team also has responsibility to inspect, monitor, detect and repair the damages of irrigation system and planning for regular maintenance and repair of hydraulic works.

c) Characteristics of unsafe reservoir and dam

As the current structure, the dam face will be eroded under the impact of waves and endangering the dam.

Due to the various plants growing on the dam face, especially large trees will be a good residential area for burrowing animals; the rotten tree root will appear the voids, affecting on safety infiltration of the dam, and limited visibility during inspection.

The residential area within the head-works area as well as the planting of large trees and the termini appears are also decrease stability of dam, and it should be developed the relocated measures.

The stone-made wall of the spillway was constructed in the longtime, and the damaged drainage facilities have formed the seepage flow along the both inside and outside of the wall. Some positions have been peeling. The height of wall is low leading to the filling of stone and soil in to the chute, and the trees grow interspersed with textured walls. Erosion and landslide have appeared in the both sides of wall creating the hole due to the surface runoff and seepage. The narrowed downstream channel and dense trees have reduced the water discharge.

4.3.3 Culture – Society

4.3.3.1 Insurance – Health care

Health care conditions of Tuyen Quang province has been gradually improving. On average, there are 9.9 doctors per 10,000 people and 2 nurses for 1-commune clinic. There are 12 hospitals and 14 village health centers in Tuyen Quang province. The total number of sickbeds is 2000. The total number of doctors and medical staffs are 400 and 1,500 people respectively.

One concrete medical station was built at Trung Mon commune, with 2 sick-beds, one doctor, two nurses and one pharmacist. The farthest residential area to the medical station is 5 km. According to the survey results in 2014, 1700 people were examined and treated at the medical station, of which 53-referral patients, and 511 non-resident patients. The community health care programs were good implementation; drinking and injecting of 7 types of vaccines were fully implemented reached the rate of 100%.

For complicated cases requiring the high professional and specialized facilities, the patients will be transferred to higher-level hospital in Yen Son district, 9 km far from the medical station or polyclinic hospital in Tuyen Quang city, with the distance of 7km.

There are no HIV / AIDS people in the region.

In the subproject area: Approximately half of the households (48.7%) surveyed in the past month got illness. According to the interviewees, there are 5 main reasons leading to the negative impacts on the people health, ranked from high to low, they are polluted water, polluted environment, food insecurity, epidemic disease appears with high frequency and lacking of water. The common diseases in the region are cold, cough, fever, high blood pressure. No outbreak disease appears in the area within 1 year.

The health insurance of the household surveyed is relatively high, accounting for 80.3%. In particular, the highest ratio of the health insurance household is in Trung Mon, accounting for 93%. Notably, the health insurance households of Kinh

households (78.6%) are lower than other ethnic minorities (88.7%). The highest income households (93.5%) are much higher than the lowest income households (68.4%).

4.3.3.2 Education

In 2014, there are 18,861 professional graduated teachers at different levels in Tuyen Quang province. 100% of preschool teachers, 100% of primary school teachers, 97.4% of secondary school teacher, and 100% of high school teachers got the national standards. There are one college, three vocational schools; 10 boarding schools and 11 district- education centers. In 2014, 400 schools and education centers attracted 98.2% of primary school age children; 85.3% of children completed primary and secondary schools; and 84% of secondary and high school.

Education: Approximately 90.0% of the population in the subproject area is educated from primary school to college / university or higher. Of which, the graduated people from secondary school and high school are more than 60 %. The graduated people from college/university or higher is only 8.0%. The illiteracy rate is 0.2% and 6.8% never attended school. The proportion of preschool surveyed in subproject area is higher than the national average as stated in the Statistical Yearbook 2013 (6.0%). This rate does not differ greatly between the surveyed communes.

Table 4 - 11: The education level of household members

	Highest Education Level							
	Illiteracy	Primary school	Secondary school	High school	College/ University	Other	Never go to school	Unknown
Total	**0.2**	**17.2**	**32.0**	**30.3**	**8.0**	**2.8**	**6.8**	**2.7**
Ethnic group								
Minority	0.3	40.2	40.2	2.5	0.0	6.3	8.6	1.9
Kinh	0.0	15.6	32.3	33.4	7.0	2.0	6.5	2.9
Income group								
Group 1 (poorest)	0.5	34.9	22.5	18.5		6.6	10.9	4.9
Group 2	0.5	22.7	35.5	6.5	0.0	3.6	6.9	1.8
Group 3	0.2	21.8	33.1	26.1	6.0	3.3	7.0	2.6
Group 4	0.0	14.8	35.5	29.5	10.0	1.5	7.3	1.9
Group 5 (richest)	0.0	9.4	23.9	43.1	10.2	2.5	6.9	4.0

(Source: APs survey 1/ 2015)

Ninh Thuan branch of Trung Mon kindergarten is located in village no.15 along the transportation road. The kindergarten is about 1.5km far from the construction site.

4.3.3.3 Infrastructure

Grid electric: The main power and electricity grid in the region are: two 35KV electric lines from Tuyen Quang city 35 KV distribution station. The power and grid electricity supply in the region are operating normally.

Construction does not include power supply. The constructive and operative solution of the works of the project is relatively small, and the power supply with the voltage of 22kV might be used to operate the offtake regulator and lighting the crest. The contractor may use the available resources by the agreement.

Electric used for construction activities is supplied from two 100 KVA generators.

Transportation

Land transportation: The inter-commune and inter-village roads are relatively developed in subproject area. At the present, the auto can be reached to 100% of the subproject communes and other construction sites. However, the road quality remains low. In the other hand, due to inclement weather and the limited investment funds, traffic works degraded rapidly caused the difficulty to travel, especially in the rainy season. Moreover, there are two highway routes running through the commune with the length of 3.5km. The inter-communal road between Trung Mon and Chan Son is 1.3km length and other 6 routes of 12.8km length.

There are two routes running through construction areas:

- The national No.2 route runs along the main cannel to the water intake of Ngoi La 2 reservoir with 2340m length; tarred road with B = 4.5m. This is an operation and management road combined which has just invested by capital budget. The route runs through village named 4, 3, 15, and 1 of Trung Mon commune, with the low density residents along two sides of the road. Starting point is from Km6 of National No. 2 route, goes through spillway to Kim Son village, Chan Son commune. The final point is Km5 + 500 of National No. 2 route. This route will be used mainly for the transportation of construction materials at the construction stage.
- The route from Ngoi La 1 reservoir to dam shoulder of Ngoi La 2 is along to the shooting practice area of Provincial military commander. The connection route from Ngoi La 1 to Ngoi La 2 is dirt road, steep, with 3m wide. The starting point of route locates in village 1, Trung Mon commune and the final point is at Dong Son village, Chan Son commune. This route will be used as temporary road during the construction of the dam. The material transportation can also use this route to reduce traffic-load for the main roads.
- There is also a system of inter-village/communal roads, etc.

4.3.3.4 Auxiliary works serving for works construction

Table 4 - 12: Description of auxiliary works serving for works construction

Work	Location	Description	Distance to work site
Disposal site	Village no. 3, Trung Mon village	Volume of about 50,000m^3, dimension of 400m long, 25 m broad, 5 m deep. It is low-lying area adjacent to traffic road going to shooting range by one aspect, 3 remaining aspects next to planted acacia hill.	2,5km
Material yards	Downstream of the dam, location 1, Trung Mon village	1,300 m^2, vegetation cover is shrubs and grass	200m
Workers' camp area	Land next to spillway in Village no. 1, Trung Mon village	1,000 m^2, is now land within safety corridor of the work. A part is occupied by local people to plant cash crops such as cucumber, bean, a part is covered by shrubs, grass	100 m
Work site	Village no. 1, Trung Mon village	1,000 m^2, is now land within safety corridor of the work. A part is occupied by local people to plant cash crops such as cucumber, bean, a part is covered by shrubs, grass	100m
Transportation road	Passing through village 1, 3, 4, 15 in Trung Mon commune The starting point is on the dam in village no. 1, Trung Mon commune and the end	- The main transportation road connecting national road no. 2 to the reservoir, length of 2430m. Asphalt road, HHs are living along the road. The houses are not adjacent to the road but 5-10 m from the road surface. Land areas in front of the house area often yard or garden. Some HHs built fence. Vegetation along the road is cash crops, fruit trees planted by HHs, shrubs. The main canal of Ngoi La irrigation system goes along the road. - The road connecting 2 reservoirs with length of 1885m. It is earth road currently, slope is quite large, slipper in rainy days, 3 m broad of road surface. There are only about 5 HH living along	

	point is in Dong Son village, Chan Son commune.	the road. Recognized vegetation along the road is mainly bushes, shrubs and some common timber trees such as acacia, bead tree.	

4.3.3.5 Tangible and intangible culture heritage

There are many landscapes located in Yen Son district such as La Mountain in Lang Quan, My Lam mineral spring in Phu Lam which could be invested and exploited for ecotourism. Furthermore, there are historical relics at Kim Quan commune, Lang Ngoi village, Da Ban in My Bang, historical monument of Nguyen Ai Quoc school, Khe Lau, Km7, Itxala congress hall, Kaysone Phomvihane monument, Souphanouvong monument.

On the 10^{th} lunar January every year, in Kim Phu commune, the Gieng Tanh festival of Cao Lan people is hold for 1-2 days. During the festival, people participate in folk games such as swinging, walking on stilts, sing and dance, etc. There are no special traditional festivals and cultural activities in the subproject area of Trung Mon commune.

Temple of Trung Mon commune located in village no. 11, area of 0,3ha is about 4,5km far from the construction area.

4.3.3.6 Gender and role of women

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

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

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

Labor and employment: The seasonal migration took place with both men and women, including women tend migration localities, and men migrated to other provinces / regions leading to the employment status of agricultural production is mainly the elderly, children and women. This is one of the issues that must be considered in the investment objectives of the subproject.

The household size: By gender of household head, the women headed households have less people than men-headed household (respectively 3.63 compared with 3.91 the people) (see the table below).

Table 4 - 12: The average members of a household

Item	Number of people Average	Size of family (%)			
		1-2 People	3-4 People	Average	Over 9 People
Total	3.7	38.2	Total	3.7	38.2
Gender headed household			Gender headed household		
+ Male	3.91	39.7	+ Male	3.91	39.7
+ Female	3.63	28.6	+ Female	3.63	28.6

(Source: SIA report, 3/ 2015)

Income and poverty: Surveying in 5 income groups with both men-headed household and women-headed household, for the lowest income group (group 1), the number of women-headed household is much higher than men-headed household (32.7% vs. 18.8%). This shows that in women-headed households, the ability to stabilize the economic condition of the family is much lower. Women are still disadvantaged in the subproject area.

Table 4 - 13: The income groups in gender (%)

List	Income group					Total
	Group 1	Group 2	Group 3	Group 4	Group 5	
Total sample	3.5	2.1	42.5	33.8	18.1	100.0
Gender of householder						
+ Men-headed household	18.8	18.5	20.4	22.3	20.1	100.0
+ Women-headed household	32.7	26.5	14.3	10.2	16.3	100.0

(Source: SIA report, 3/ 2015)

Living standard: According to the results of self-assessment of the living standard of families, most of the households in both men-headed households and women-headed households are evaluated with average living standards. The percentage of women-headed households is higher in this ratio (64.2% vs. 57.1%). In poverty condition, the percentage of women-headed households also is higher; the difference in the lower level of the men-headed households (18.4% vs. 12.3%).

Table 4 - 14: Self-assessment of living standard

Standard of living	Rich	Normal	Needy	Poverty
Total sample	29.1%	63.4%	5.0%	2.5%
Gender of householder				

+ men-headed households	8.2%	57.1%	16.3%	18.4%
+ women-headed households	8.5%	64.2%	15.0%	12.3%

(Source: SIA report, 3/ 2015)

4.3.3.7Other services:

Water supply

Water sources for domestic use

Most of surveyed households in subproject area are used tap water (over 95%) for domestic use. The ratio of using other water sources is low: no household uses lake or river water, 1.4% using other source and 1.0% using water from digging-well.

Water source for eating and drinking

As domestic use, water sources for eating and drinking of local people in surveyed commune are mainly from tap water, at a rate over 95%, only 4% using water from digging-well.

If thinking of relatively clean water in rural areas, so the sources are included: tap water, drilled/ digging wells, rainwater and bottle water, then there is 98% of people to ensure water sources for drinking. However, it must be noted that people in project area do not use water from ponds and lakes for drinking.

Thus, in surveyed subproject area, water sources for drinking and domestic use are not satisfied in all quantity and quality, so keeping clean water during dry season may be the best meaningful for local people in subproject area.

Since 95% of households in Trung Mon are supplied water for drinking and living purposes, drinking water for workers in camps is supply water, (buy from households), water for other purposes is from the reservoir.

Construction activities will use water from the reservoir

Sanitation

There are 73.6% of households in surveyed area using sanitary latrines, including 45.1% of households using flush/semi-flush toilets, 28.5% of households use 2-compartment toilet. In addition, about one quarter of households (24.7%) also use the simple type toilet (digging in the garden, bridge on lakes, rivers and streams), and 1.2% of households have no toilet.

By income groups, the highest percentage of households used the unmeet standard toilets are poor and nearly poor groups (group 1 and 2): group 1, 2 were 47.4% and 32.1% respectively. The 5.3% of poorest group has no toilet. In contrast, 89.8% of the richest income group (group 5) uses the standard toilets.

According to the interviewees, at present, there are 5 main reasons caused the negative impacts on the people health, ranked from high to low which are polluted water, polluted environment, food insecurity, more disease and lack of water.

Two of the five most important reasons caused the negative impacts on people health related to water are polluted water (the highest proportion of 55.8%) and lack of water.

According to the surveyed results, there are 98.2% of households using sanitary latrines, including 66.1% of households using flush/semi-flush toilets, 28.5% of households using 2-compartment toilet. In addition, there is 3.7% of households using the simple type toilet, and 1.2% of households have no toilet.

4.4 ETHNIC MINORITY

The ethnic minority people in Trung Mon commune is approximate 5%.

According to results from questionnaire and evaluation, some information of ethnic minorities in Trung Mon commune is analyzed as following:

Demographic: In terms of ethnicity, the average size of an ethnic minority household is 3.9 people and Kinh is 3.6 people.

Occupation: The percentage of households working in agriculture-forestry-fishery sector of Kinh is lower than other ethnic minorities (44.4% vs. 65.9%). In contrast, the proportion of non-agriculture households of Kinh is higher than other ethnic minority (2.1% vs. 0.9%).

Education: The illiteracy rate of the ethnic minorities is very low, only 0.3% (this figure is only focused on those older than 60).

Health insurance: The rate of health insurance people in the surveyed households is quite high. Notably, the ratio of health insurance people of Kinh households (78.6%) is lower than other ethnic minorities' households (88.7%).

Hygiene: The percentage of minority households using unqualified toilets is much lower than Kinh households: 17.4% vs. 60.5%.

PART 5
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

5.1 SUBPROJECT ENVIRONMENTAL AND SOCIAL IMPACTS SCREENING

List of subproject environmental and social impacts is expressed in table below:

Table 5 - 1: Environmental and social impacts need to be handled

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
1.	The trespass on historical/cultural heritage	No impact	There is NO any cultural works or heritage been found in subproject scope area
2.	The trespass on ecosystem (natural sensitive living environment or nature reserve, natural park, etc.)	No impact	The subproject only improves current status without widening and violating to nature reserve… Furthermore, there is no nature reserve or natural sensitive living environment in the distance of 20km from Ngoi La 2 reservoir. Therefore, activities of the project will NOT trespass on ecosystem**.**
3.	To deform landscape and increase waste	Low	*To deform landscape* may be generated from activities of land clearance including land acquisition making change of land use, dismantling for construction site, trees cutting, etc. The area should be withdrawn (temporary and permanent) to serve construction including: permanent acquisition of 22,100m^2 of land around the Ngoi La 2 construction 2 to expand spillway and upgrade management road; and temporary use of approximately 2,000m^2 of land surrounding the project area to serve as ground for construction and camps. Among permanently acquired land area: 300m^2 of residential land, 2,245 m^2 of garden land and 19.555m^2 of public land for agricultural production. Besides, an area of 1,300m^2 of vacant land managed of Trung Mon CPC is used as yard for materials

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
			construction. There is no valuable crop on land but bush, grass. This impact is LOW, because: a) Permanently acquired land areas serve for expand spillway, and upgrade management road. Landscape of the area will be improved. b) Amount of surplus, material from dismantling is not large, only generated from dismantling 1 house and old spillway; c) Surplus, material from dismantling will be moved to disposal site to ensure empty ground for construction; d) Safety requirement in construction will be complied to ensure tidy construction site. *Increase of waste:* There are 03 solid waste sources arising from construction activities including: type (i) construction waste likes debrides from surface leveling activities (plants, residual, etc.), cement bags, oil barrels and type (ii) domestic waste from tents of workers in construction site and type (iii) superfluous excavated soil. In addition, waste mud from latrine can contain harmful bacterium's need to be treated during construction process. The above impact is LOW and TEMPORARY because: a) With type (i) and type (iii), the solid waste is not harmful, as for remaining material (with total estimated volume around 47,677 m^3 including estimated dismantling material of 247.82$m^{3)}$ has been collected and moved fast to disposal site. Disposal site is bare land on road connecting 2 reservoirs, 2,5km from the construction site. Major of excavated soil will be utilized as filling soil. b) For the waste type (ii): In the high-leveled construction period there are around 50 people working in construction site thus the amount of potential waste is not much, estimating around 15–25 kg per day (around 0.3-0.5kg/person/day). c) The amount of solid waste arising in construction period can be easily managed as per regulation on solid waste management. The domestic waste like mud of latrine will be treated conforms to designed standards of Ministry of Health and the quantity of this mud can be used for planting as a fertilizer for soil.

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
			Location: Workers' camp and within 50 m around the camp, area of spillway demolition and within 50 m around. Period: 18 months The ground leveling and environmental landscape return will be carried out by construction contractor in the last 3 months of subproject construction stage.
4.	Demolish trees or vegetation cover	Low	Implementation of project is based on the current status of the work, thus, there is no any vegetation cover be demolished or damaged. Only 2 bare lands, approximately 1,000m^2 managed by the commune will be used for worker camps, site operation camp. However, this ground is without any vegetation.
5.	Change quality of surface water or flow (e.g., increase water turbidity, wastewater discharged from camp and erosion, and construction waste).	Low	Impacts on water environment may arise from the sources: domestic wastewater of workers, water with oil and grease from construction machineries, equipment, and rainfall runoff. In construction phase, number of workers concentrating in construction site can reach to 50 people; amount of wastewater generated is 3,200 liters/day (64 liters/day/person). Domestic wastewater flowing into water source will be risk to make the amount of the substance in the water causing water pollution increase. There are around 10 vehicles, machineries operating regularly in construction site. The average amount of oil used each time to change oil is about of 18 liters/time x 4 times/year. Thus the amount of oil discharged in construction time from 10 vehicles would be about 1,080 liters. Spilled oil from machinery and construction equipment or water when washing machines can pollute and decline water quality and aquatic ecosystems. Wastewater and oil compounds may be sunk into the ground and over time will gradually seep into aquifers and contaminate aquifers. Besides, wastewater from toilets of worker camps if not applied properly can also influence water quality of nearby. However, this impact is LOW and TEMPORARY because:

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
			i) Location of camp, oil storage yard is far from water sources (2 km) ii) With low amount of domestic wastewater of 3.,00 liters/day, average concentration of substance in domestic wastewater pouring into stream is very small. The impact can be controlled by mitigation measures; iii) Construction of the subproject will take place in dry season when rain fall level is the lowest. Thus, the possibility of oil, grease or compounds washed and swept into water source is very little iv) Wastes from petroleum products can easily be stored in a safe place in the standard containers (i.e. containers with lids), and the contractor will have to collect and dump waste and hazardous waste damage at right places. Location: Dam, spillway and petroleum storage yard, downstream area Duration: 18 months of construction time
6.	Increase the level of dirt or contaminants in the air during construction process	Low	During dam, spillway, bridge and auxiliary works repairing period, some activities described below will cause negative impacts such as dust, emissions affecting lives of local people: - The operation of equipment and trucks on management road passing through residential areas of the Village 1, 3, 4, 15 in Trung Mon commune, Kim Son village of Chan Son commune, a kindergarten in village no. 15 in Trung Mon commune. - Transportation of construction materials and waste passing through public earth route; - Every day, during construction period, there are about 15 trucks travelling on roads. The amount of dust and emission can cause respiratory disease or lung diseases to people (such as sinusitis, asthma, etc.) if people, workers directly contact with the pollutant sources for long time. However, this impact is LOW and TEMPORARY because: i) The project area is in midland interspersed large plains, open space. Dust that can easily be diluted in the air and blown by wind; ii) Construction of the categories in the project (dam and ancillary works) is mainly taken place in

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
			the village 1, Trung Mon commune. The area is sparsely populated, only a few families living near the construction area. iii) The transport road of construction materials and waste to disposal site passes through one village, and residential area is also sparse. This impact is evaluated as very small iv) Number of vehicles/construction equipment especially vehicles/equipment causing noise is not much; about 15 trucks passing through residential areas will not generate a large amount of emissions. Location: Transportation road connecting from national road no. 2 to the reservoir with length of 2,430m passing village 1, 15, 3 and 4 of Trung Mon commune. Construction site in village 1, Trung Mon commune Period: 18 months of construction phase
7.	Increase noise/vibration	Low	Noise can be caused by the transportation of construction materials and construction equipment (excavators, bulldozers, road rollers, compactors) affecting HHs and schools along the road section for construction. Every day during the construction phase, about 15 trucks travel on the road. During construction and transportation of material, waste and noise will be generated and can affect to people living along the route. Particularly, a kindergarten in village no. 15 in Trung Mon commune is located on the transportation road. However, this impact is LOW and TEMPORARY because: i) Subproject area is open space, with lots of plants and crops which may dilute the noise ii) The residential area adjacent to the road and construction works are distributed fairly sparse, with a low population density. iii) The number of equipment / facilities construction generating noise is not significantly large. About 15 vehicles and machinery of all kinds will go through the route every day, thus the noise level is not high. Location: Transportation road connecting from national road no. 2 to the reservoir with length of

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
			2430m passing village 1, 15, 3 and 4 of Trung Mon commune. Construction site in village 1, Trung Mon commune Period: 18 months of construction phase
8.	Resettlement of households? If yes, how many households?	Low	There is 1 household of relocation. Currently, this HH have been arranged land in nearby area, ready for relocation.
9.	Use resettlement region being environmental and/or cultural sensitivity	No impact	Relocated household have resettled in nearby residential area. Consultation results confirm that there is no use of resettlement region being environmental and/or cultural sensitivity
10.	The risk of disease transmission from human to local people (and vice versa)	Low	The temporary presence of workers residing in local households or their living in camps and their interaction with local people can cause infectious diseases among workers with local people and vice versa. During construction process, the use of water without meeting sanitary standards for workers in the camps or at construction site may also cause gastrointestinal disease or the spread of disease transmission via insect (i.e. dengue fever, malaria, etc.) when migrant infected workers are bitten by insects (mosquitoes) and then the disease is spreaded to others. Besides, various social diseases such as HIV / AIDS, syphilis etc. are also the risk if workers from elsewhere bring the diseases to the local and without proper and strict health care program.
11.	Potential to cause conflict between construction workers and local people (and vice versa).	Low	During construction period, approximately 20-30 technical workers from other provinces are about living and working locally. During this time, there may be conflict between the local labors and labors from elsewhere due to disagreements about the culture or communication or disputes on employment opportunities. However, these effects are LOW and TEMPORARY because: i) According to state regulations, the contractor will have to declare temporary residence, temporary

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
			absence of all the local workers to live and work during the project implementation to Trung Mon commune government; ii). Migrant workers are disseminated, guided by contractor on how to communicate, notify with local government and people. In addition, contractor shall develop provisions in management of workers iii) A number of workers (30%) will be hired locally to perform simple tasks such as shoveling dirt, cutting trees, pottering construction materials. Location: Trung Mon commune. Period: 18 months of construction phase
12.	Use explosives and toxic chemicals.	No impact	Explosives or toxic chemicals will not be used during construction process of the subproject
13.	Use construction site where the accident happened due to blasting or explosive from war.	No impact	Subproject will not use the site where occurring mine accident. Some places where gathering material and workers' camp are vacant spaces and safe, introduced and allowed by the local government and the people. In the area where performance of soil excavation carried out will need mine clearance to ensure safety during construction. The total area should be undertake mine clearance is of 2,17ha of land along the management route and left side of the spillway.
14.	Construction activities may disrupt transport, roads, or waterway.	Low	Construction period may impact local travel, transportation, as well as the risk of accidents: a) increase risk of accidents due to the increase of the means through inter-commune roads and construction sites (where the excavation activities are carried out, and where the construction equipment, waste locates on or next to roads, works, etc.). It may danger local people, especially at night when visibility is limited; and suspended dust particles reduces visibility; b) the construction of the dam and ancillary works such as management road will limit the ability of people to travel as well as access to social infrastructure such as schools, markets, etc.

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
			However, these effects are LOW and TEMPORARY because: i) Volume of construction means is shared. Beside the transportation of construction materials will use road connecting national road no. 2 to the dam surface, which is the current road often used passing through the sparsely populated areas, the road connecting Ngoi La 1 reservoir and Ngoi La 2 reservoir will also be utilized. This management road is currently earth road, less used by people. Thus, use of this road for material transportation will not obstruct traffic much. ii) The number of vehicles/equipment for road construction is about 15 trucks per day during the peak construction period is negligible iii) A part within scope of the contractor is to ensure the health and safety on construction sites for individuals and construction site; it is not allowed to happen the risk to the safety of people. Therefore, the contractor shall take measures to minimize the impact during construction process Location: Dam, spillway, management road and road to transport material and waste in Trung Mon commune Period: 18 months of construction phase
15.	Construction activities may cause any damage to the local roads, bridges or other rural infrastructure?	Low	The construction materials or waste transporting process on rural roads can damage the road if the trucks are overloaded and operate much in rainy season. Other rural infrastructures such as canal system, electric cable system, communication cable system are not affected by the construction of the subproject, because these work lie in the safety corridor of the main roads. On management road, there is no electric cable system, communication cable. Route for transportation passes through only one kindergarten in village no.15 of Trung Mon commune. However this kindergarten is far 10m from road surface. Thus, these social infrastructures are not likely to be affected by the construction activities. Main canal system of Ngoi La irrigation system running along the main road may be affected by

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
			material spilled from the truck in movement process or caused by the large load vehicles. This impact may break the canal structure or weaken the structure due to the vibration caused by large load trucks. The impact is LOW and TEMPORARY because: i)The construction is carried out mostly in dry season, thus material transportation vehicles cause low impacts on quality of the road; ii) The volume of construction materials and the number of vehicles transporting materials is small, about 15 turns of 7-ton truck/ day during the peak time of construction; iii) The provisions of tonnage and speed of vehicles carrying materials are specified to ensure that the incident damaged the infrastructure does not occur; Location: Management road and road to transport material and waste in Trung Mon commune, main canal route of Ngoi La 2 reservoir Period: 18 months of construction phase
16.	Excavation during construction of the subproject can cause soil erosion	Low	Dam slope and spillway construction process may cause erosion on dam body or nearby location. However, this effect is LOW and TEMPORARY because the repairing activities for dam slope and spillway will be carried out in the dry season. The location of construction is located above the water level. Moreover, dam base is built with cement; it is difficult to cause soil erosion. Location: Ngoi La 2 reservoir, spillway and dam slope Period: 18 months of construction phase
17.	Is it needed to create a temporary and permanent service road?	No impact	It is no need to create a temporary and permanent service road, because the current roads are capable to transport construction materials or waste. Within scope of the subproject, only one road will be upgraded connecting Ngoi La 1 and Ngoi La 2 reservoir from earth road muddy and slipper in rainy season to concrete road, length of 1885m. The road starts at dam surface of Ngoi La 2 reservoir in Trung Mon commune and ends at Dong Son

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
			village, Chan Son commune
18.	Divide or disintegrate habitat of animals and plants.	No impact	+ Flora and fauna in the reservoir will not be affected by the project and will not create an impact on water quality or water. + For terrestrial flora: There is no position as habitat of flora and fauna around the subproject area and area indirectly affected
19.	Long-term impact on air quality.	No impact	The sources of air pollution mainly from dust caused by the transportation of construction materials, waste transportation, etc. running on the roads in Trung Mon commune. In addition, the air may be polluted by emission from construction machinery, vehicles. However, it is very few source of emission and it only appears in certain time. Therefore, there is NO long-term impact on air quality but a temporary impact on air
20.	The risk of accidents for workers and communities in the construction phase.	Low	Construction process can make risk of accidents due to operating machinery, digging and filling process or transporting materials in case that the workers do not comply with regulations on occupational safety. In addition, the construction can also cause accidents for community if access of people into the construction area is not limited. However, the impact is LOW and TEMPORARY because: i) Number of construction machinery is few (total of 27 units of machinery during entire construction process) ii) Much activities will be carried out manually such as pottering material, etc. Thus, risk of accident will be reduced. iii) Construction activities are mostly undertaken in dry season, accident is also reduced. iv) Construction site is far from residential areas, at least 300 m. Location: Construction site and along the material and waste transportation road Period: 18 months of construction phase

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
21.	Use hazardous or dangerous material and generate hazardous waste	No impact	There is no need to use hazardous or dangerous material or generate hazardous waste. Only a low amount of oil use for machinery leaks to environment.
22.	Risks to safety and human health.	Low	During construction, there may be risks of occupational safety, risk of respiratory diseases due to smoke, dust contamination
23.	Affect to water supply and production during construction of work items	Low	Total construction time is expected to be 18 months, including 3 months of site clearance and compensation. The construction progress of items as below: Construction of water intake: expected within 2 months (from March before April 30th of the first year). During this time, water intake stops working. However, crop season lasting from May to August after the time of cutting water. Thus, there is no impact on water supply for production. Construction of dam and spillway is carried out during period of 15 months. In the first year, construction of dam will be taken place to elevation of normal water level + 41.5m. The construction of water intake, spillway and dam will not affect the water taking for production.
24.	Increase flooding, sediment transport in downstream area	No impact	Ngoi La 2 reservoir is independent reservoir; its downstream area is irrigated areas. Construction process will need to drain water in reservoir to death water level, but mainly during the dry season, when the water in the reservoir reach to low level. In addition, the area is supplied with good drainage system, thus this impact is considered as LOW and TEMPORARY.
25.	Land acquisition (temporary or permanent) of public land (public or private)	Low	The area should be withdrawn (temporary and permanent) to serve construction including: permanent acquisition of 22,100m^2 of land around the Ngoi La 2 construction 2 to expand spillway and upgrade management road; and temporary use of approximately 2,000m^2 of land surrounding the project area to serve as ground for construction and camps. Among permanently acquired land area: 300m^2 of residential land, 2,245 m^2 of garden land and 19,555m^2 of public land for agricultural production.

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
	for construction		This impact is LOW, because: i) There is only 01 HH of relocation ii) The relocated HH can resettle in nearby residential area; iii)The affected household will be compensated and supported sufficiently comply with resettlement policy framework (RPF) (Detail in RAP) Location: Trung Mon commune Period: Preparation stage of the project
26.	Use land being currently possessed or used regularly for production purposes (e.g., gardening, farming, grazing, fishing, forest)	Low	Among permanently acquired land: 300m^2 of residential land, 2,245 m^2 of garden land and 19,555m^2 of public land for agricultural production.
27..	Relocation of personal, family, or business.	Low	Implementation of the subproject will acquired land of 01 HH but does not affect business operation, because construction activities is carried out around dam area and along the management road. There is no business along the road and next to the dam.
28.	Temporary or permanent loss of crops, fruit trees, house or infrastructure.	Low	Subproject will affect 115 fruit trees, mainly mango tree, grapefruit tree
29.	Restrict compulsory access of people into preserved park and	No impact	No preserved park or conservation area locating in subproject area, thus it is not likely to occur this impact.

N^0	Does subproject cause these impacts?	Impact levels	Description of impact
	conservation area.		
30.	The ethnic minority groups living within or near the subproject.	Low	In subproject are – area around Ngoi La 2 reservoir, in Trung Mon commune, there is very few ethnic minorities. Kinh people accounts for 95% in population of Trung Mon commune. Ethnic minorities HHs scatter and intermingle with Kinh people community. Thus, the project will not affect minority groups locally
31.	Members of minority groups in the region may be benefited or harmed by the project.	Low	Ethnic people in Trung Mon commune, as well as other objects there are beneficiaries of the project
32.	Relate to construction of a large dam?	No impact	Ngoi La 2 reservoir has low dam with height of less than 15m, thus it is not a large dam as defined by WB.
33.	Depend on water level supplied by a dam existing or under construction?	Low	Ngoi La 1 reservoir is located in upstream of Ngoi La 2 reservoir. And transfers water to Ngoi La 2 reservoir in dry season

5.2 ETHNIC MINORITY SCREENING

As part of the social assessment, where ethnic minority (EM) peoples are present in the subproject area –as confirmed by the EM screening (as per Bank's OP 4.10), consultation 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).

The results of ethnic minority screening showed that very few ethnic minority people (5%) living in the subproject area (including affected communities and beneficiaries). Therefore, it need not to prepare a ethnic minority development plan for this subproject.

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

5.3 GENDER ANALYSIS

There are some gender issues in the scope of the sub-project.

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

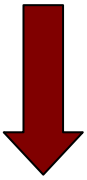
(ii) **Access to education:** All boys and girls have equal rights to go to school however the rate of attendance for girls is always lower than boys.

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

(iv) **Women's participant in local government system:** Through interviews with chairmen of commune PCs, it was recorded that women accounted for 20% within the Commune PC structure. No woman played a role as chairwoman of the Trung Mon CPC. Most women do not play leadership positions that influence the decision-making process.

(v) **Health:** Health conditions of women in Trung Mon commune is not serious. However, not only women but also the community has the high potential risks of contracting diseases such as diarrhoea, skin allergies and other forms of infection.

Gender analysis: The schematic representation below shows the identification of different roles and responsibilities related to water management, water use and water collection in the project area.

MEN	WOMEN
LESS concern with household water security and family health, unsafe water and its harm on family's health.	CONCERN with household water security and family health, unsafe water and its harm on family's health.
MUCH LESS participation in hygiene and sanitation education	PARTICIPATE most in hygiene and sanitation education
PLAY MINOR ROLE in educating children and other members of the family on good hygiene behaviors such as regular bathing, safe drinking, handling of water etc.	PLAY MAIN ROLE in educating children and other members of the family on good hygiene behaviors such as regular bathing, safe drinking, handling of water etc.
	
TOTALLY make decision on water use plan, water distribution and water store	NOT ABLE to make final decision on water use plan, water distribution and water store
OFTEN make decision of construction, design and location	HARDLY make decision of construction, design and location
OFTEN assume responsibility of managing and protecting the reservoir	HARDLY assume responsibility of managing and protecting the reservoir

5.4 POSITIVE IMPACTS ON ENVIRONMENT AND SOCIETY OF THE SUBPROJECT

5.4.1 Impact on the society

The project will bring many benefits to the people, in particular, increase agricultural productivity and yield, increase number of crop season, develop aquaculture through ensuring water supply for irrigated area, and reduce disaster risk. After completion, construction works will ensure stability of water supply for 1.054 hectares of rice and vegetables annually (including 1 crop = 414 ha of rice, 113 ha of crop); for 354,13 ha of 2-season rice and 6.11 ha of winter crop of existing irrigated area of Trung Mon, Kim Phu commune in Yen Son district; Y La, Tan Ha, Hung Thanh wards in Tuyen Quang city; ensure providing water for aquaculture with areas of 15ha and prevent negative impacts on the environment, landscape and downstream area; increase production and non-agricultural business through agricultural development, increase income and improve living standards; create more jobs and contribute to poverty reduction.

The positive impact will influence large parts of disadvantaged groups. Those who have productive land are most benefited directly by irrigation impacts.

5.4.2 Impacts on environment

1) The impact on air quality and microclimate of the region

Repairing, upgrading reservoir may impact on air environment at different stages with different level of influence. At this stage of preparation and execution, air environment is mainly polluted by dust and emissions from the construction site preparation, roads, warehouse, material yard, transport of materials, etc. These impacts take place only within a small space, discontinuous and polluting locally. In operation stage, (after completion of the project), the impact of the work will influence some meteorological factors in the region.

Reservoir area is characterized by humid tropical climate and monsoon, river system is the product of large-scale climate. The nature of the dry continental climate of this region becomes evident during the dry season. Operation of the reservoir will contribute to change microclimate of the area.

Thus, impact on air environment and microclimate in project area in phase of management and operation is considered positive with relatively large scale. In order to quantitatively determine the variation above, it needs to conduct meteorological observation activities and regular study as well before and after construction.

During the operational phase, the sub-project will increase the stability of water, ensure the safety of the dam and downstream areas. There is almost no negative impact on atmosphere.

2) Impact on landscape

Spillway of Ngoi La 2 reservoir is currently free flow, width B = 5m. During the flood season, when the water is higher than normal water level, the water will flow over flood spillway toward downstream. As recommended by the design consultants, to ensure the safety of reservoirs, flood spillway will be extended to 12m. After extending the full width is 17m. With dimension after expansion of 17m, when there is flood, the water level will rise less than spillway in current status, the stability of the reservoir will be higher, reducing the water level rising and falling erratically following the floods, ensuring conditions for the development of coastal vegetation, creating new landscape for the reservoir.

Landscape of reservoir: After upgrading, renovating, the landscape around the reservoir becomes more spacious, cleaner and beautiful (management road, road connecting 2 reservoirs Ngoi La 1 and Ngoi La 2 is upgraded to concrete road) . Beautiful landscape combined with convenient transportation will attract visitors to visit; tourism will increase funding for local.

Improve the ecological environment: Ecological environment will be significantly improved by planting trees, forest and ecosystem restoration after construction is completed.

3) Impacts on ecosystem

Stable and safe operation of reservoir contributes to the development of forest ecosystems. Impacts on ecosystems are evaluated as medium, long term and continuous in life of the project.

4) Impacts on sedimentation, erosion

The reservoir is designed, built to ensure design flood frequency of 1.5% and inspection flood frequency of 0.5%. The reservoir will be upgraded to ensure flood frequency of 0.01%. The calculation results of flood control show that spillway should be expanded from 5m as current status up to 17m. The spillway expansion will increase the flood drainage capacity; water level will reduce faster than current status. Due to fast reduction of flood water level in the reservoir, time for floodwater to deposit in the reservoir will reduce resulting in reduction of sedimentation amount in reservoir. Slower sedimentation will improve life-time of the reservoir, reducing the cost to dredge the reservoir bed.

With dimension after expansion of 17m, when there is flood, the water level will rise less than spillway in current status, the stability of the reservoir will be higher, reducing the water level rising and falling erratically following the floods, ensuring conditions for the development of coastal vegetation, creating new landscape for the reservoir.

5.5 NEGATIVE IMPACTS ON ENVIRONMENT AND SOCIETY OF THE SUBPROJECT

5.5.1 The historical negative impacts and mitigation action

Historical negative impacts

Ngoi La 2 reservoir had been constructed since 1973 to 1975.

The first improvement was conducted in 1999. In this time, the spillway foundation was covered by concrete. Bridge across the spillway is heightened and widened to ensure traffic. The canal system was partly solidified.

In 2012, dam crest and management route were upgraded and covered by cement concrete.

According to the results of a baseline survey in March 2015, there has been an infiltration area with the length of 215m on the dam body occurring since 1973, concentrating on elevation from 31.0m to 35.0m in the reservoir and from elevation 34,0m to 37,0m at water intake. It can be observed that the dam was infiltrated mainly through dam body.

Mitigation action

So far, there is no serious incident of the reservoir causing environmental and social impact.

Dam seepage has happened to the Ngoi La 2 reservoir. During the construction process, some measures should be done to overcome this problem as follows:

- Works must be executed according to plan and proposed measures;
- Comply with the provisions of the state on dam construction, reservoirs and dam safety;
- Lowering the reservoir water level to ensure the safety of the construction process;

- Make plans for incident prevention, mobilize governments and local people ready to respond when the incident occurs.

5.5.2 Impacts during pre-construction phase

5.5.2.1 Activities in project preparation phase

- Trees cutting (trees growing on downstream and upstream slope, etc.);
- Site clearance;
- Concentration of equipment and machineries to construction site.

5.5.2.2 Sources of impacts

Solid waste generating sources

- Ground leveling, vegetation cutting: estimated demolition volume of 247.82 m^3, volume of cleft earth of 3,363 m^3
- Cement covering, surplus of construction material, solid waste of workers, etc.

Liquid waste generating sources

- Disposal of oil and grease;
- Oil and grease generating from car and equipment washing and repairing places;
- Domestic wastewater from construction workers on site;
- Wastewater generated at camp, concrete batching plants, construction sites.

Emission generating sources

- Concentration of equipment, machines;
- Upgrading management road;
- Operation of transportation vehicles.

Sources of impacts not relating to waste

They are sources affecting physical and ecological environment, such as: erosion, landslide, riverbank erosion, siltation; change of environmental factors, biodiversity change.

5.5.2.3 Impacts on society

i) The impact of noise to the people

Noise may be generated from some activities as follow: cutting trees, demolishing works, transporting waste to disposal site. About 2 bulldozers 110CV, 3 excavators 1.6m^3, 5 trucks with load of 7-10 tons will operate alternately on site at various locations. Of which, the noise level at a distance of 1m from the device corresponding as follows: bulldozers from 77-95 dBA, excavators from 72 to 82.5 dBA, truck from 82-94 dBA. As the distance increases, the noise level at a distance of 10m decreases from 22 to 25%; 50m respectively, the noise level reduces from 38 to 40%. However, the noise is resonance because of simultaneous operation of means.

According NTR 26: 2010/ BTNMT, allowed noise in public sector and residential area is from 50 to 70dBA (from 6.am to 21.pm), so the noise only locally affects within radius of 50m. Therefore, the object affected by noise can only be workers on site. This effect ***can be controlled*** by the mitigation measures.

ii) Impacts on socio-economic environment

Human factor is the issue of primary concern in any project, so that the evaluation is prepared to ensure their legitimate rights. Thus, in preparation and site clearance phase, duty to assess environmental impact must identify the negative impacts to the living conditions of the people. So that property mitigation and remedial measure can be proposed. In this project, in preparation stage, impacts to socio-economic environment occur mainly in reservoir area, etc.

- Residential land: 01 AH, affected land area of 300 m^2
- Garden land: 11 AHs, affected land area of 2,245 m^2
- Productive/agricultural land: not affected
- Permanent house/structure/property: 1 AH, affected land area of 77 m^2
- Temporary house/structure/ property: not affected
- Affected crop: not affected
- Affected trees: affecting 115 trees (various kinds of fruit trees including dragon fruit, grapefruit, mango trees, etc.) of 11 AHs.

The impact on the lives, psychology of local communities: Analysis of project showed that in the preparatory phase of the project, only a part of the community has lost land. This group is Kinh people, state acquires land to for construction will not greatly affect farming practices. The only impact of the project during this period is the impact on livelihoods and income. That can impact on life, psychology of the affected people. Because of small area of land acquisition, the impact is insignificant.

Affect the safety of dismantling workers and community:

- The risk of electric shock during clearance can cause fire and generate smoke, dust, debris endangering to workers and people.
- Falling materials during dismantling can cause accidents.
- Transporting bulk materials prone to accidents on transportation road, especially when passing the road with relatively high density of means or near schools.
- The process of demolition, site clearance, and excavation may reveal the toxic substance buried earlier in the project area or hazardous substances in new waste directly affecting the health of workers and people.

Affecting local transport, infrastructure:

Site clearance process will increase the traffic flow (due to transporting solid waste disposal). The increase in traffic flow may affect to infrastructure system and traffic safety.

However, the volume of solid waste are not much (over 3000m^3) is placed in vacant land on a public road connecting the two reservoirs, about 2.5 km from the site (away from residential areas), will not affect traffic. In addition, site clearance process will be carried out during a short time; it is possible to control this effect.

5.5.2.4 Impacts on environment

i) Impacts on natural environment

Impact on water environment: Demolition of bricks, concrete structures and transportation of materials such as cement, brick, stone, plastic, wood, etc. as well as solid waste and domestic waste, domestic wastewater arising from the workers without handling properly as prescribed can be swept over with rainwater into the water source and increase environmental pollution load of water;

Impact on air environment: During the preparation phase, most of the activities are likely to cause air pollution; the main pollutants are from vehicles transporting materials and construction equipment. Source of pollution is dust generated from these materials; dust generated by the friction between the vehicle and road surface, emissions from construction equipment. Demolition of works (spillway, 01 house, etc.) may also give rise to dust, noise at small scale.

Impact on soil environment: Site clearance will demolish part of the existing works, such as demolishing old spillway, 01 house located in the upstream slope of earth dam and some pig stables of households in downstream the dam. Thus, the creation of a solid waste is inevitable, and may include municipal waste generated by workers and construction machinery. If without collection and treatment, it is possible to increase the load of pollutants to soil environment;

Number of workers, means and machines concentrating at site in this phase is not large, thus the scale of the impact is insignificant.

Due to not large scope of construction site and only 1 HHs of relocation, site clearance can be undertaken fast, time for these impacts on natural environment is short.

ii) Impacts on biological environment

On dam slope, including upstream and downstream slope, there are many trees growing. The trees are mostly bamboo, jackfruit, banana and some shrubs. This is the nesting place, residents of some organisms such as bird, crickets, mice, etc. When the project to upgrade and repair dam is taken place, especially upgrading the dam roof, vegetation growing on two dam slopes will be cleaned, the animals living within the dam slope will be affected

However, small animals can move to other areas, in the garden of households or vacant land with vegetation having similar characteristics to live.

Figure 5 - 1: Vegetation on upstream slope

Tuyen Quang department of aquaculture is implementing test of fish cage in the reservoir. The test will be completed in November 2015. The construction activities are expected to start from early 2016. Thus, the fish cages are almost unaffected..

Figure 5 - 2: Fish farming in reservoir

Temporary acquired land area is about 2,000 m^2 of vacant land used for camp, material yard and disposal site, thus biodiversity will not be affected. Moreover, after project completion, communes have plan to plant trees on the temporary acquired land, effect to biodiversity in the project area is not significant.

5.5.3 Impacts during construction phase

5.5.3.1 Activities during construction phase

- Repair water intake;
- Repairing and upgrading upstream and downstream slope;

- Expanding and constructing spillway;
- Repairing and upgrading management road.

5.5.3.2 Sources of impacts

Sources of impacts relating to waste

Solid waste generating sources

- Domestic waste of workers å construction site;
- Solid waste from material at sites: dropping soil and rock, cement covering.

Liquid waste generating sources

- Water to wash rock, gravel;
- Disposal oil and grease;
- Domestic waste water of workers at sites;
- Rainfall runoff.

Emission generating sources

- Excavation, filling and leveling activities;
- Constructing management road;
- Transporting and unloading materials;
- Mixing concrete;
- Operation of transporting trucks;
- Operation of construction equipment such as bulldozers, excavators, compactors, trucks, etc.

Sources of impacts not relating to waste

Due to severe weather conditions such as heavy rain, storm, wind, floods occurring during construction phase making seepage in hillsides, upstream slope headwork area, resulting to sliding erosion due to gravity; Due to the construction method in ground leveling, removal of waste rocks in steep terrain areas along the river, leading to increase amounts of sand into the river, increasing turbidity, affecting directly to water supply and water use of downstream residents.

Lack of awareness of people and workers in the management of municipal waste, water washing machinery. Construction equipment can contaminate surface water, groundwater and soil environment.

5.5.3.3 Impact on the socio- economic and socio - cultural environment

a, Land acquisition, impact on economy of people

Beside, project also causes negative effects such as land acquisition of several households with a total land area permanently acquired of 22,100 m^2. If the mitigation measures are not applied or not applied well, such as compensation is not satisfied, no support to restore livelihoods for farmers whose land is recovered will lead to a risk

that a part of AP may face to poverty and impoverishment. On the other hand, the increase in agricultural production as crop area expansion and aquaculture may lead to the risk of water pollution due to increase demand for fertilizers, pesticides and industrial food.

Land acquisition affects people in project area. Among AHs, 1 AH has to relocate. The affected structure is located in safe corridor of irrigation work. Moreover, this HH temporarily stays in the house to monitor the fish cages in program of Tuyen Quang aquaculture department. However, after consultation and survey of this household, compensation will be paid in cash because they have other place to live in. Therefore, the resettlement strategy is not necessary (detail in RAP)

Permanently acquired land: Permanent acquisition of land serves only for expanding spillway and upgrading management road. Area of land permanently acquired is of 2,18 ha. In which:

Total area acquired for dam and spillway construction: 3,920 m^2

Area acquired for management road construction 1,788 ha

Temporarily acquired land: Area of temporary land use is for construction work, including:

Area of sites; total of 1,000 m^2 of land scattering along the main road in vacant lands.

Areas of camp, site regulation house: 1,000 m^2.

Area of material yard: 1,300 m^2

b, Impact on local social stability:

* *Impact on local social stability*

The presence of the works will promote the short term service coming with the project, increasing demand for food to serve for workers involved in construction works. However, the demand for food and non-food of workers is not high, it will not affect much the balance of supply - demand in the region. The ability of local can fully meet the needs of the work at all aspects.

Construction process requires concentration of a number of workers from other areas may cause a conflict between the workers and local residents. So these migrant workers must comply with the provisions of the law on public administration and demographic management.

* *Impact on the safety of workers and the community:*

During transport, the rock dropping on road without clearing would harm the lance, endanger people and vehicles, and increase risk of traffic accidents.

Besides the current route connecting national rod no. 2 to Ngoi La 2 dam, the transport of materials will be shared by using the route connecting two reservoir Ngoi La 1 and Ngoi La 2. The traffic on main road is basically guaranteed. In addition, the density of traffic on these roads is low and population density along the road is quite sparse, risk of accident is low level. Therefore, the operation of trucks serving for the project will not cause major problem of traffic accidents on the transportation road. However, the construction unit should still apply mitigation measures to prevent traffic accidents.

As prescribed, the maximum load of trucks is 7 tones, and velocity of 30km/h when passing inter-commune roads. The overloaded trucks may damage traffic infrastructures, cause traffic accident.

Besides sparse populated residential areas, not next to the roads, the main transportation route pass through a kindergarten in village no 15, Trung Mon commune. It is the position prone the most to risk of accident in the entire project area.

Domestic waste from the camps without proper management and sanitary treatment such as odors, leading to the concentration of infecting organisms such as flies, mosquitoes, rats cause adverse influence to health of workers and community.

** Impacts to local infrastructures*

The construction materials or waste transporting process on rural roads can damage the road if the trucks are overloaded and operate much in rainy season.

Other rural infrastructures such as canal system, electric cable system, communication cable system are not affected by the construction of the subproject, because these work lie in the safety corridor of the main roads.

On management road, there is no electric cable system, communication cable. Route for transportation passes through only one kindergarten in village no.15 of Trung Mon commune. However this kindergarten is far 10m from road surface. Thus, these social infrastructures are not likely to be affected by the construction activities.

Main canal system of Ngoi La irrigation system running along the main road may be affected by material spilled from the truck in movement process or caused by the large load vehicles. This impact may break the canal structure or weaken the structure due to the vibration caused by large load trucks.

c, Impact on public health

Investment into the project will affect mostly to environment during construction phase, transporting material, noise of machinery, etc. Besides, migrant workers from elsewhere may the source of infectious diseases. Their living may also affect adversely to local tradition and provision. The management project agencies need to consider the health risks such as sexually transmitted diseases and prepare propaganda activities, closely monitor this activity.

For economic issues, social, sub-project will bring positive impact and long-term. The negative impact is considered insignificant and only occurs mainly during construction.

5.5.3.4 Impacts on environment

Impacts on natural environment

1) Impacts on water environment

a. Domestic wastewater

During peak period of construction phase, there will be 50 workers, but are scattered in four work items. Domestic wastewater is generated from the personal cleanliness such as cooking, eating, personal hygiene.

According to national regulation TCXDVN 33:2006 for region of Yen Son district – a mountainous district, average volume of water for domestic purpose is 80

liters/day/person. The amount of wastewater is equal to 80% volume of domestic water, so that it will produce 64 liters of waste water per day. With number of 50 workers, volume of waste generating every day is of about 3.200 liters/day, equivalent to 3,2 m^3.

Wastewater: wastewater contains mainly organic matter, suspended solids and microorganisms.

During construction time (18 months = 540 days), about 1,728 m^3 of domestic wastewater of 50 workers in construction site will generate. Without measure to collect and treat wastewater, it may be poured and overflow surface and seep into the ground and contaminate soil and groundwater environment in site areas, or pour into the water sources causing water pollution for the receiving sources.

Domestic wastewater pouring into river will be risk to increase concentration of compounds in water causing water pollution. However, volume of wastewater may pour into La stream of 3.2m^3/day (equivalent to 1200 m^3/year); volume of suspended solid is about 1kg/day (equivalent to 365 kg/year), so average concentration of suspended solid in domestic wastewater pouring into the stream is very low. The impact can be controlled by mitigation measures.

b. Wastewater from construction activities

During construction process, the agents that cause water pollution are mainly oil leaking from equipment, process of equipment repairing, dust in the air, settling dust, mud, soil on surface of work site. In rainy time, the agents will be washed into surface water, which may reduce water quality in reservoir, canals and other surface water in the area. Runoff rainfall flows through the site will swipe oil, rubble, debris, dirt, dust and rocks on the surface to the reservoir or nearby canal increasing turbidity and causing greasy scum. Runoff rainfall will wash away soil from materials yards and disposal sites, leading to increase of turbidity in the water, causing sedimentation in drainage canals, obstructing drainage capacity of the area.

At the construction site for earthworks, concrete, drilling, grouting, etc. rainwater often swipes soil, rubble, construction waste away into the reservoir and canals in surrounding area, increasing turbidity, water pollution by alkaline from concrete, reducing the pH and water quality.

Activities such as leveling, earthworks and disposal areas will also impact on surface water quality due to excavated soil, filled soil and soil erosion, especially in rainy season. However, this amount will not be concentrated in one place but scattered over 4 works (dam, spillway, water intake, management road).

In addition, activities from concrete mixing plants, the production of highly alkaline, waste materials such as cement paper, plastic may interfere with the flow, pollute water source in case of decomposition.

Measures to minimize the impacts on water environment due to construction waste, soil erosion are presented in part 6 of the report.

Construction wastewater: Construction wastewater from the stone grinding and screening station, stone washing places, building materials yards, concrete mixing plants, concrete placement area contains cement, sand, though few but very dense. Without centralized processing before discharge, it may increase turbidity and water pollution caused by alkaline from concrete. According to calculations of design consultants, volume of effluent approximately $1m^3$/day, the load of pollutants during construction (540 days) as follows:

Table 5 - 2: Load of pollutants in construction wastewater

Pollutant	Norm (mg/l)	Pollutant load (kg)
COD	625	0,3375
BOD_5	303	0.1636
SS	6,800	3.672
Grease	44	0.2376

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

- Leaked oil, disposed sludge of motor vehicles, machinery.

Lubricant is mainly arisen from the machinery maintenance and repair facilities. The average amount of oil used for each time of maintenance of about 18 liters/vehicle x 4 times/years. With around 10 vehicles operating, amount of oil discharged during construction time will be about 1080 liters. This is the source of pollution to surface water and groundwater in the area (groundwater and water in reservoir and in La stream). It is necessary to take measures to collect and treat appropriately to minimize this impact.

c. Runoff rainwater

Rainwater swiping building materials, soil and sand away will also be source of contamination to water sources in the area. Construction period of important items are concentrated in the dry season, however, does not exclude the possibility of flood in dry season causing by large showers (May, June), thus, the impact is inevitable. Ground of the project area is of $22,000m^2$, average rainfall of the area is of 1,598mm/year, total rainfall runoff on site will be $3,675.4m^3$/year (20% of rainfall will soak into the ground). When it rains, storm water runoff flows over the construction area with soil, sand, scum, grease, etc.

2) Impacts on air environment

a. Pollution from dust

Dust from transportation, unloading materials

During transportation process, due to vibration and wind, dust, soil and sand from the trucks and road will be swept with wind generating dust. Amount of dust

generating depend on the quality of the road conditions, the method of unloading and gathering materials. Concentration of dust will increase in sunny days; spreading scale can range up to 200m in days with large wind.

During construction time of 18 months, there will be 470 vehicles/month, equivalent to 15 vehicles/day.

Dust generating from earthworks

Sources of dust are from ground leveling and compaction during manual construction of the dam; process of unloading building materials from the transporting means; the transportation of surplus from earth excavation to disposal sites.

- Activities undertaken during construction time include: Manually leveling and compacting: about 9,501m^3; material transportation, including sand, rubble, cement, etc. Around 4,450 m^3 (detail in Table 2.3), transportation of surplus soil to disposal site: 34,219m^3;

The amount of dust generated is not much, only arises in the construction area, thus it may only affect the health of construction workers. In addition, during material transport process, distance to transport building materials to the construction site is relatively far, from 7-25km, project area away from the center, the density of trees is large; it is possible to diffuse dust. Impact does not occur often during construction time, thus the impact can be mitigated.

The increase in dust will be seen most clearly in the area of the project site. However, because the construction site is spacious, tree density is relatively high in the region; it is considered that impact of dust to the atmosphere is negligible

b. Pollution from emission

** Emission from means using diesel*

Emissions from vehicles contain gas: SO_2, CO_2, CO, NO_x, VOC, etc. This kind of air pollution depends on number of construction vehicles, machinery and methods of construction.

For human: Locations that can be affected include amps areas, areas where work categories focus on (dam route area), residential area 300 m away from the subproject area with low population density.

Compared with the largest radius can be affected of emissions arising from transport activities in the construction phase (about 50 meters), the area of workers' camps and residents will not be affected.

In comparison with national technical standard 05:2013/BTNMT, concentration of TSP, CO, SO_2 and NO_x generated by transport process is with allowed limitation. Particularly, concentration of VOC of 0,014 mg/m^3 is not identified in NTR 05: 2013/BTNMT.

c. Pollution from noise

Noise is generated mainly from excavation and earth filling activities by equipment, transport vehicles, etc. There are number of machineries and equipment used during process of repairing, upgrading work items (table 2.4). Noise can adversely affect workers at site and cause discomfort for people living in surrounding areas.

The calculation results show that the noise level decreases with the distance to the source point. In 50m range, the noise level will be approximately NTR26: 2010/BTNMT, so in this range, workers are allowed to work continuously for only 21 hours. However, according to the calculations, there are about 10 vehicles operating alternately, possibility of noise resonance is high.

Noise may adversely affect most parts of the human body. For animals: The daily operation of machinery, equipment, vehicles will raise the noise affecting the living and behavior of animals living near the work (some aquatic fauna in the region characteristic of the freshwater fish such as carp, grass carp, etc.)

However, the above calculation results show that the largest radius of influence of noise emitted from the operation of machinery, equipment and vehicles is 50 meters (outside this range are less affected and people may live and act for 21 hours). Therefore, the impact of noise only affects workers on site. In addition, the project is far from residential areas (outside radius, 300m), population density in areas is low, moreover, density of trees is high, and so the noise will not affect the people. This effect can be controlled by the mitigation measures describing in chapter 6.

3) Impacts on soil environment:

The activities of material transportation, gathering materials, etc. will adversely impact soil environment, breaking the surface structure, altering the fertility of the soil surface (where topsoil removing). Domestic waste of workers, waste from construction activities, oil and grease from equipment directly discharged into the soil will partly contaminate soil. These impacts will make loss of vegetation cover, partly influence field ecosystems, if there are no proper measures of restoration. The area of land occupied temporarily for construction of ancillary items is about 0,2ha. Therefore the application of appropriate mitigation measures should be noted.

- As in investment report of the project, the volume of soil excavation, filling and dismantling works include:

Topsoil removing: 3,363 m^3.

Excavated soil: 43,720 m^3.

Utilized soil from excavation for back filling: 9,501 m^3.

Thus, total amount of soil should be transported from construction site is of 37.582 m^3.

- Amount of workers at peak period of construction time of 50 people, average volume of waste generated of 0.05 tons/day. After 18 months (540 days) of construction, total domestic waste is of 1.35 tones. Compared with disposal soil and stone, domestics waste accounts for very small scale. However, the domestic waste composes mainly of organic matter with a high risk of causing illness in humans and animals should be effectively treated.

Solid waste generated during construction will be collected and taken to disposal site of the project with area of about 0.5 ha, capacity of 50,000 m^3. It is vacant land located in Trung Mon commune under management of CPC. CPC has handed over this land area to Ngoi La reservoir management board to use and manage serving for construction. After completion of the project, Ngoi La reservoir management unit will plant trees on this land in order to return the landscape and environment. The impact is assessed as low, can be controlled by applying mitigation measures.

- Hazardous waste generated in this phase may contain fluorescent lamps, rags containing oil, waste oil, etc. These sources, if not being collected, processed but dispose without control to surrounding area will be a source of environmental pollution, degradation of land environment (land becomes harder, dead microorganisms, affecting yield), breaking the landscape. Therefore, investor should request construction units to implement measures to rent functional units to collect waste and transport to processing area to reduce, minimize adverse impacts due to this discharged source.

Impacts on biodiversity

a. Impact on aquatic ecosystem

Construction activities on the site such as digging soil, draining water for construction may increase turbidity in reservoir, change water quality due to leakage of grease. Loss land for acquisition loses habitat, laying eggs place, kills fish, and reduces photosynthetic capacity of algae. It will adversely alter the habitat of fish and other aquatic species, affect the lives of aquatic ecosystem.

b. Impact on terrestrial ecosystem

Cutting trees, vegetation and removing soil surface may cause soil erosion. However, these activities are calculated in detail in initial stage of construction to minimize scope of the impact. In next stage of the construction, mitigation measure are applied such as paving, surface treatment, and water to ensure that the impact insignificant.

Noise from excavation, leveling creates vibrations that affecting life, biological behavior and make animals move out from their living area.

However, there is few species of terrestrial and aquatic animal in the project area, the impact is relatively clear, but localized and short-term, so that level of influence to ecological environment is insignificant. The construction causes direct or indirect damages to the flora and wildlife. This effect is primarily due to turbulence, move and re-distribution on ground. The impact is mostly short-term and limited in

construction area. The most direct impact to wildlife is to build, expand the spillway. The level of impact is considered small

5.5.3.5 Impacts assessment for each category of construction

Repairing water intake

Parameters after repairing: concrete texture D800mm; threshold elevation 33m; design flow 0,64 m^3/s; length 55m.

Construction, repairing, upgrading activities: Rubber washer in 2 valves of water intake will be changed. Installation of opens VDD instead of old V5 opens.

Impact assessment: Construction of water intake: expected within 2 months (from March before April 30th of the first year). During this time, water intake stops working. However, crop season lasting from May to August after the time of cutting water. Thus, there is no impact on water supply for production.

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

However the impact is LOW and TEMPORARY because:

i) Construction of water intake is carried out in dry season and cofferdam will be developed if necessary. Thus, scope of impact on water supply is very low.

ii) Construction schedule will be informed to people so that they can make plan for production, living.

iii) Time to drain water is properly selected, prevent time required to take water for crop in downstream.

Location: Ngoi La 2 reservoir, water intake

Duration: 18 months of dam and spillway construction

Upgrading upstream and downstream slope of the dam

Parameters after repairing: Homogeneous earth dam; largest height of dam of 15m, length 556 m. The dam crest elevation at 44.8m; crest width of 5.0m; upstream slope coefficient: 3; downstream slope coefficient: 2.5.

Construction, repairing, upgrading activities:

- To upstream slope: Fix erosion and cover the slope structure; remove the plant soil, treat surface exposed to new backfilled soil; backfill soil as the existing slope coefficient. Reinforce with tile in the concrete frame.
- To downstream slope: Remove vegetation cover, treat surface exposed to new backfilled soil; backfill soil as the existing slope coefficient. Reinforce with grass and rock in downstream.

Impact assessment: On upstream slope, 140m and 230m from the right side of the dam, there are many plants encroaching into the reservoir (figure 5-1, appendix 10), including timber trees and fruit trees such as bead tree, mango tree, guava tree, etc. It is inhabited by some insects such as mites, crickets, beetles, etc. When the project to upgrade and repair dam is taken place, especially upgrading the dam roof,

vegetation growing on two dam slopes will be cleaned, the animals living within the dam slope will be affected

However, small animals can move to other areas, in the garden of households or vacant land with vegetation having similar characteristics to live.

The cleanup, site clearance generating noise will affect the fish living in the reservoir However, area and amount of cut trees is low, this impact is insignificant.

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

Location: Ngoi La 2 reservoir, spillway and dam slope

Period: 18 months of construction phase

Expanding spillway

Parameters after repairing: Width: 17m; spillway threshold elevation +41.5m; flood flow discharge (1.5%) 6.9 m^3/s; stone coated concert texture, thickness 10cm;

Construction, repairing, upgrading activities:

- Expand the spillway to the left side for 12 m
- Length of the first segment of chute is remained; the second segment is narrowed toward stilling basin BxH= (10x10)m.
- Texture of entire new item is concrete M200 thickness of 20cm, base is concrete M100 thickness of 10cm
- Dredging, extending and straightening upstream canal, reinforce with stone M75 to facilitate and ensure flood drainage.

Impact assessment:

Construction of dam and spillway is carried out during period of 15 months. In the first year, construction of dam will be taken place to elevation of normal water level + 41,5m. The construction of water intake, spillway and dam will not affect the water taking for production nearby location. However, this effect is LOW and TEMPORARY because the repairing activities for dam slope and spillway will be carried out in the dry season. The location of construction is located above the water level. Moreover, dam base is built with cement; it is difficult to cause soil erosion.

Location: Ngoi La 2 reservoir, spillway and dam slope

Period: 18 months of construction phase

Repairing, construction management road

Parameters after repairing: Cement concrete road length L =1,885m, width of road base 6m, width of road surface 3.5m

Construction, repairing, upgrading activities: The management road is repaired and upgraded to cement concrete road, cut slope.

Impact assessment:

1 reservoir and Ngoi La 2 reservoir will be upgraded, in order to better operation of the system and use in case of incident.

The road connecting Ngoi La 1 reservoir and Ngoi La 2 reservoir is a segment on road going to shooting range of provincial military command. This segment is earth road, relatively steep, width of road surface of 3m. The starting point is on the dam in village no. 1, Trung Mon commune and the end point is in Dong Son village, Chan Son commune. The road will be temporarily used when the dam under construction. Material transport will also use this road to release pressure on the main road. Recognized vegetation along the road is mainly bushes, shrubs and some common timber trees such as acacia, bead tree

Acquired land area for construction of management road estimated of 1ha is garden land of HHs. Affected trees are fruit trees (grapefruit, star fruit, etc.) and crops with low value, not rare vegetation.

Construction period may impact local travel, transportation, as well as the risk of accidents:

- Increase risk of accidents due to the increase of the means through inter-commune roads and construction sites (where the excavation activities are carried out, and where the construction equipment, waste locates on or next to roads, works, etc.). It may danger local people, especially at night when visibility is limited; and suspended dust particles reduces visibility;;
- The construction of the dam and ancillary works such as management road will limit the ability of people to travel as well as access to social infrastructure such as schools, markets, etc.

However, these effects are LOW and TEMPORARY because:

- Volume of construction means is shared. Beside the transportation of construction materials will use road connecting national road no. 2 to the dam surface, which is the current road often used passing through the sparsely populated areas, the road connecting Ngoi La 1 reservoir and Ngoi La 2 reservoir will also be utilized. This management road is currently earth road, less used by people. Thus, use of this road for material transportation will not obstruct traffic much.
- The number of vehicles/equipment for road construction is about 15 trucks per day during the peak construction period is negligible
- A part within scope of the contractor is to ensure the health and safety on construction sites for individuals and construction site; it is not allowed to occur the risk to the safety of people. Therefore, the contractor shall take measures to minimize the impact during construction process

Location: Dam, spillway, management road and road to transport material and waste in Trung Mon commune

Period: 18 months of construction phase


Figure 5 - 3: Starting point and ending point of management road

Impacts assessment at disposal site and transportation road

The disposal site is a narrow land area, located between two hills. The length is of 400 m, 25 m broad and 5 m deep. The volume is of about 50,000 m^3 (volume of waste soil is of 34,813m^3). Due to characteristic of topography, the disposal site will not affect partial flood drainage capacity as well as water withdrawing. However, when heavy rains occurs, waste may be washed with rainfall runoff and contaminating soil, water in a small valley downstream of the disposal site.

For road transport: Asphalted road, and the households are living along the two sides. People often build their houses with the distance of 5-10 meters from the road. The area before the house is used as a field or orchard. Some households built the walls of brick around their land. Main canal of the Ngoi La irrigation system was built parallel to the transport road.

During the transport process, trucks will cause noise pollution, smoke and dust. Moreover, the frequent movement of heavy-duty trucks on the road increases the risk of affecting the canal due to shocks. In addition, the soil can also drop down and make the sedimentation in the canal.

5.5.4 Impacts during operation phase

5.5.4.1 Activities in project operation phase

- Open/close water intake;
- Drain flood water;
- Take water for irrigation.

5.5.4.2 Sources of impacts

In this phase, the source of the environmental impact can be some kinds of solid, liquid waste of people planting forest in the region higher than the water level and benefited area. This is also a source of impact on environmental quality, but the scope of the impact depends on the number of households and land use.

- Solid waste from residential area and agricultural production.
- Solid waste from the use of fertilizers and pesticides in agriculture.
- Domestic, industrial wastewater;
- Change the design of works

5.5.4.3 Impact on the society

The project will bring many benefits to the people, in particular, increase agricultural productivity and yield, increase number of crop season, develop aquaculture through ensuring water supply for irrigated area, and reduce disaster risk. After completion, construction works will ensure stability of water supply for 1.054 hectares of rice and vegetables annually (including 1 crop = 414 ha of rice, 113 ha of crop); for 354,13 ha of 2-season rice and 6.11 ha of winter crop of existing irrigated area of Trung Mon, Kim Phu commune in Yen Son district; Y La, Tan Ha, Hung Thanh wards in Tuyen Quang city; ensure providing water for aquaculture with areas of 15ha and prevent negative impacts on the environment, landscape and downstream area; increase production and non-agricultural business through agricultural development, increase income and improve living standards; create more jobs and contribute to poverty reduction.

The positive impact will influence large parts of disadvantaged groups. Those who have productive land are most benefited directly by irrigation impacts.

1) Increase irrigated area

Investing, improving and modernizing Ngoi La 2 reservoir will gradually contribute to improvement of infrastructure, living condition of the people in difficult region.

2) Impacts on culture, society

If the project is implemented and effective in the coming years, i.e. water is ensured for production, over a third of people those being surveyed have planned their production plans. This shows the potential impact of the project on increase of production of the project area. Therefore, the demand for increase crop season of rice, of crop in project area is large. On the other hand, the increase in rice production will facilitated demand to solve problems such as post-harvest processing, preservation, as well as consumer organizations, farmers can benefit more in the value chain of rice.

Social impact of the rise and transformation of economic activity in conditions that the project provides enough water for production, may create more jobs, especially for groups of employees, reduce leisure time after harvesting season and contribute to poverty reduction. However, the project also has negative impacts such as land acquisition and resettlement, livelihood and business affected by relocation; likely to occur water use conflicts. These impacts need to be considered and to find solutions to reduce in various periods of project implementation.

3) Impact on management, operation capacity of irrigation system

The project is implemented in order to ensure safety of reservoirs, in addition, to support provincial management units in project area to prepare long term agricultural development scenarios, strategies, regarding to climate change scenarios, the realization of activities aimed at implementing the national target program to mitigate and adapt to climate change; Irrigation Development Strategy 2020 and Vision 2050; National Strategy for water supply and rural sanitation by 2020; The socio-economic development of mountainous areas by 2020; The national target of new rural construction; etc.

5.5.4.4 Impacts on environment

1) The impact on air quality and microclimate of the region

Repairing, upgrading reservoir may impact on air environment at different stages with different level of influence. At this stage of preparation and execution, air environment is mainly polluted by dust and emissions from the construction site preparation, roads, warehouse, material yard, transport of materials, etc. These impacts take place only within a small space, discontinuous and polluting locally. In operation stage, (after completion of the project), the impact of the work will influence some meteorological factors in the region.

Reservoir area is characterized by humid tropical climate and monsoon, river system is the product of large-scale climate. The nature of the dry continental climate of this region becomes evident during the dry season. Operation of the reservoir will contribute to change microclimate of the area.

Thus, impact on air environment and microclimate in project area in phase of management and operation is considered positive with relatively large scale. In order to quantitatively determine the variation above, it needs to conduct meteorological observation activities and regular study as well before and after construction.

During the operational phase, the sub-project will increase the stability of water, ensure the safety of the dam and downstream areas. There is almost no negative impact on atmosphere.

2) Impact on landscape

Spillway of Ngoi La 2 reservoir is currently free flow, width B = 5m. During the flood season, when the water is higher than normal water level, the water will flow over flood spillway toward downstream. As recommended by the design consultants, to ensure the safety of reservoirs, flood spillway will be extended to 12m. After extending the full width is 17m. With dimension after expansion of 17m, when there is flood, the water level will rise less than spillway in current status, the stability of the reservoir will be higher, reducing the water level rising and falling erratically following the floods, ensuring conditions for the development of coastal vegetation, creating new landscape for the reservoir.

Landscape of reservoir: After upgrading, renovating, the landscape around the reservoir becomes more spacious, cleaner and beautiful (management road, road connecting 2 reservoirs Ngoi La 1 and Ngoi La 2 is upgraded to concrete road) . Beautiful landscape combined with convenient transportation will attract visitors to visit; tourism will increase funding for local.

Improve the ecological environment: Ecological environment will be significantly improved by planting trees, forest and ecosystem restoration after construction is completed.

Spillway on the left side of the dam, based on terrain conditions and results of hydraulic calculation, plan to repair the spillway is to expand the spillway to the left side for 12 m. total width of free flow spillway after upgrading is B = 17,0m.

- Length of the first segment of chute is remained; the second segment is narrowed toward stilling basin BxH= (10x10) m.
- Texture of entire new item is concrete M200 thickness of 20cm, base is concrete M100 thickness of 10cm
- Dredging, extending and straightening upstream canal, reinforce with stone M75 to facilitate and ensure flood drainage.
- Upgrade bridge crossing the spillway to concrete bridge, width of 5m (equal to width of dam crest), and length of 17m.

So after repairs, upgrades, the spillway and stilling basin, drainage canal system will create a new look for the reservoir, the reservoir will be new, beautiful, modern and safer.

3) Impact on water environment

Operation of the subproject after upgrading will increase the ability to take water from the reservoir may result in change of flow velocity, sediment transport and the current flow regime. These problems can lead to soil erosion and sedimentation along the irrigation system.

Impacts related to wastewater

Sources of liquid waste include: Domestic wastewater of workers operating the work: Currently, Ngoi La irrigation management board is managing the system. After upgrading, more staffs may be mobilized to manage the work. However, there is no management house at headwork position. Staff of the board is using a 3 km from the reservoir office. Therefore, there is no risk of emissions from the waste of staff managing and operating works.

Rubber washer in 2 valves of water intake will be changed. Installation of opens VDD is to instead of old V5 opens. Oil and grease used for valve during maintenance can contaminate water in reservoir. However, scope of the impact is small due to low amount of oil will be used for this item. In addition, operation and management unit is in charge of environmental protection and safety in operation, they will detect and report of incidents to water reservoir relating to oil to relevant agencies.

In addition, during flood season, some issues may generate, including wood, dead carcasses drifting down into the reservoir. This is also the source of water pollution. However, duration of action is short (during and after flood season), and operation management unit is responsible for handling the incident. Thus this effect can be minimized.

4) Impacts on ecosystem

Stable and safe operation of reservoir contributes to the development of forest ecosystems. Impacts on ecosystems are evaluated as medium, long term and continuous in life of the project.

5) Impacts on sedimentation, erosion

The reservoir is designed, built to ensure design flood frequency of 1.5% and inspection flood frequency of 0.5%. The reservoir will be upgraded to ensure flood frequency of 0.01%. The calculation results of flood control show that spillway should be expanded from 5m as current status up to 17m. The spillway expansion will increase the flood drainage capacity; water level will reduce faster than current status. Due to fast reduction of flood water level in the reservoir, time for floodwater to deposit in the reservoir will reduce resulting in reduction of sedimentation amount in reservoir. Slower sedimentation will improve life-time of the reservoir, reducing the cost to dredge the reservoir bed.

With dimension after expansion of 17m, when there is flood, the water level will rise less than spillway in current status, the stability of the reservoir will be higher, reducing the water level rising and falling erratically following the floods, ensuring conditions for the development of coastal vegetation, creating new landscape for the reservoir.

According to the survey results, in normal operational condition, regular flood water level in the reservoir is higher 0.3-0.5 m than normal water level. Current widen of the spillway is 5m. Thus, flow of regular flood passing the spillway is about 2-3m3/s. Discharge flow over the spillway corresponding to regular floods is quite small in comparison with water transferring capacity of stream system behind the spillway. Expansion of the spillway will enable flood discharge capacity, ensure safety of the reservoir in case of larger flood or equivalent to design flood. For regular flood, difference of discharge flow over the spillway is insignificant since regular flood flow is not large, water volume flowing over the spillway pours into the old stream bed only, equivalent to operation of the current spillway. Decreases of discharge flow over the spillway because of expansion of the spillway reduces erosion of stream system receiving water behind the spillway.

PART 6
ALTERNATIVE ANALYSIS

6.1 NO ACTION ALTERNATIVE

a) Dam

As the current structure, the upstream face will be continuously eroded when the waves drop, endangering the dam. It needs to be urgently reinforced such as by concrete or stone. Before being reinforced, erosion on the dam face needs to be fixed. 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. The dam slope should be adjusted and reinforced against waves. Wells on the slope in the reservoir should be filled and leveled.

Figure 6 - 1: Photo on current situation of upstream slope

Seepage has stabilized at a few locations, however it needs to supplement appropriate equipment to protect downstream slope and ensure safety. Infiltration places on the side of the reservoir when water level rising should be examined carefully, in order to suggest suitable measures.

There are no safety facilities such as light, railing, marker, etc.

The dam body has not been demarcated and there is no barrier, thus, there is trace of cattle grazing on the dam crest. The boundary between the construction site and residential area has not been identified; people are living and farming near the dam base. People make fence by planting which makes it difficult to check the work.

There is no longer drainage facilities on dam body and drainage equipment on dam face, improper drainage condition increases risk of dam infiltration.

b) Spillway

Free flow spillway is on the left side of the earth dam; width Btr = 5.0m; covered by reinforced concrete with thickness of 10cm; following by a chute and cushioning pool, dimension BxH = 10 m x 10 m; the elevation is +41.50m.

Spillway surface and bottom of chute encased by concrete is relatively in good condition, slope at the end of the chute is large.

After long time use, along with damaged drainage facilities, there are infiltration lines in both inside and outside of the spillway wall. Some places are sloughed (figure 6-4). Height of wall is essentially low, soil and rock from 2 sides of spillway easy to come into the chute and trees interspersed with textured wall (figure 6-5). There are many eroded pores on the right chute caused by surface runoff and seepage. Width of the pore is about 80cm, length is of about 2m (figure 6-3). Narrowed downstream canal with much plant growing on obstructs the ability to drain water.

Figure 6 - 2: Eroded pore on the side of chute

Figure 6 - 3: Chute

Figure 6 - 4: Side wall is damaged

Figure 6 - 5: Low side wall

Entire canal system of Ngoi La irrigation system with length of 12,417 km has high proportion up to 97% (12,127 km) of consolidation. However, after long time of consolidation, majority of canal have been severely degraded, broken, sediment which reduces water transfer capacity, particularly to remote field sites. Water shortage in the last month of spring crop season (October – November) as feedback of people is not

caused by low water level in Ngoi La reservoir, but mainly due to water loss in the canal resulting in not enough water transferred to the field.

The spillway will be expanded for 12 m on the left side (B=17m); flood discharge flow will be increased from 19.67 m^3/s to 47.21 m^3/s; Checked flood discharge flow design achieves 83,02 m^3/s. Masonry encased by reinforced concrete stilling basin with thickness of 10cm is remained, dimension BxH = 10m x 10m.

6.2 WITH PROJECT IMPLEMENTATION ALTERNATIVE

a) Upgrading upstream and downstream slope of the dam

Parameters after repairing: Homogeneous earth dam; largest height of dam of 15m, length 556 m. The dam crest elevation at 44.8m; crest width of 5.0m; upstream slope coefficient: 3; downstream slope coefficient: 2.5.

Construction, repairing, upgrading activities:

- To upstream slope: Fix erosion and cover the slope structure; remove the plant soil, treat surface exposed to new backfilled soil; backfill soil as the existing slope coefficient. Reinforce with tile in the concrete frame.
- To downstream slope: Remove vegetation cover, treat surface exposed to new backfilled soil; backfill soil as the existing slope coefficient. Reinforce with grass and rock in downstream.

b) Repairing water intake

Parameters after repairing: concrete texture D800mm; threshold elevation 33m; design flow 0,64 m^3/s; length 55m.

Construction, repairing, upgrading activities: Rubber washer in 2 valves of water intake will be changed. Installation of opens VDD instead of old V5 opens.

c) Expanding spillway

Parameters after repairing: Width: 17m; spillway threshold elevation +41.5m; flood flow discharge (1.5%) 6.9 m^3/s; stone coated concert texture, thickness 10cm;

Construction, repairing, upgrading activities:

- Expand the spillway to the left side for 12 m
- Length of the first segment of chute is remained; the second segment is narrowed toward stilling basin BxH= (10x10)m.
- Texture of entire new item is concrete M200 thickness of 20cm, base is concrete M100 thickness of 10cm
- Dredging, extending and straightening upstream canal, reinforce with stone M75 to facilitate and ensure flood drainage.

d) Repairing, construction management road

Parameters after repairing: Cement concrete road length L =1,885m, width of road base 6m, width of road surface 3.5m

Construction, repairing, upgrading activities: The management road is repaired and upgraded to cement concrete road, cut slope.

PART 7
ENVIRONMENT AND SOCIAL MANAGEMENT PLAN (ESMP)

7.1 ESMP OBJECTIVE

- Ensure to comply with regulations, laws, standards and application manuals at the provincial and national levels.
- Guarantee to have sufficient allocated sources based on project budget to implement ESMP activities.
- Ensure the environmental and social risks of subproject have been managed properly.
- To cope with unanticipated and undefined environmental issues in environmental impact assessment of project.
- Feedback to continue to improve environmental activities results.

Contents of Environmental and Social Management Plan (ESMP)

Environmental and Social Management Plan (ESMP) outlines impacts mitigation measures, supervision and institution that will be deployed during project construction and operation to avoid or controlling adverse environmental and social impacts and necessary activities for implementing mitigation measures. ESMP creates useful association between measures to mitigate adverse impacts and ensures those measures will be deployed.

The contents of ESMP give out implementation responsibility, performance supervision, implementation expenditure and time of the implementation of mitigation measures as proposed in part 7. The synthesis of environmental and social management plan of subproject is as follows:

7.2 MITIGATION MEASURES

7.2.1 Mitigation measures

7.2.1.1Mitigation measures in preparation phase

Table 7 - 1: Measures to minimize the environmental impacts of the sub-project in the preparation phase

Potential impacts	Mitigation measures	Effectiveness Advantages / disadvantages
Dust emissions	Equipping sprinkler vehicles, watering the road. Spray water in the leveling area or transport routes	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.
Noise	Ensure the best operating status for	These mitigation measures are

Potential impacts	Mitigation measures	Effectiveness Advantages / disadvantages
generation	construction machinery and trucks by maintenance works	simple, easy to implement, and do not need the complex technology and complex technique. However, there must be a commitment by construction contract between building contractors and project management unit. Noise impacts can only mitigate, not being able to completely overcome.
	The loud noise activities should conduct over a period of working day	
Waste generation	Solid waste bins	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 oil waste. It should have the consistency between the construction contractors. There should be a strict sanctions and the closely monitoring.
	Oil waste bins	
	Grease rag bins	
	Portable toilet	

Table 7 - 2: Measures to minimize the social impacts of the sub-project in the preparation phase

Potential impacts	Mitigation measures	Effectiveness Advantages / disadvantages
The impact on families that losing agricultural land	Implement the mitigation measures as outlined in the resettlement plan. The clearance and resettlement is the responsibility for the compensation, support and resettlement of the district	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.

7.2.1.2 Mitigation measures in construction phase

Table 7 - 3: Measures to minimize the environmental impact of the sub-project during construction period

Potential impacts	Mitigation measures	Effectiveness Advantages / disadvantages
1. Detecting artifacts during excavation	- The contractor must protect the scene and reporting to the constructive supervised officers, PMU, museum/culture management agencies in local - Put the found items for museum/culture management agencies. Determine whether to continue to build or suspend to further investigation - Director of Information and Culture department and Director of the Provincial Museum have the responsibility for the subsequent processing steps for items that found under the Article 21 of Decree No. 92/2002 guiding the implementation of the Law on Cultural Heritage	After detecting the artifacts, perform the actions in order, protecting the artifacts.
2. Detection of relics during excavation	Protect the scene and report to the local governments Determine the people who have the responsibility to solve the works. Determine where and how to resolve, and suggest the follow-up activities	After detecting the relics, perform the actions in order, protecting the relics
3. Rocks and dropping material deposits the reservoir, channels, and rice fields during clearance, soil excavation and material transport	+ Avoid clearance activities in the rainy season, clean up the completed work before moving on to a new line. + Install the sewer grates in the drainage ditch; + Dredge canals in the rainy season (if necessary) if the canals have a lot of sedimentation. + Clean and dredge soil, sand and rubble that spill down to paddy fields, canals ...from the vehicle being dumped	Highly effective, without technology or complex technical, and easy to implement. 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.

Potential impacts	Mitigation measures	Effectiveness Advantages / disadvantages
4. Soil pollution from spilling and leaking oil or other chemicals	+ 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; + Vehicles and construction equipment should be maintained in a good condition. + Unused chemical and petroleum should be wrapped carefully before transporting to the qualified store. The box contains chemical waste that cannot reuse should be separately collected and transported to specialized units to handle.	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. 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.
5. Water and aquatic environment pollution from waste, chemicals, effluent or contaminated land	+ 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 requires having 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.	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.
6. Air pollution due to dust or other	Carry measures to minimize dust and air pollution, as follows: + Cover the trucks that transport constructive materials with canvas	These mitigation measures are feasible, simple, easy to implement, and consistent with the ability

Potential impacts	Mitigation measures	Effectiveness Advantages / disadvantages
emissions (CO, NOx, SOx, etc.)	during the transport process. +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. etc. 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.	of the contractor. It will be effective under close and serious monitoring. However, these impacts can only minimize, not being able to completely overcome.
7. The noise generate from construction equipment	+ The motor vehicles, construction equipment must be maintained periodically. + Avoid performing construction activities near residential areas in the lunch hour, or after 20 PM. + Inform the construction plans regularly to communities and local government by phone, speakerphone, text, or on the notice board of the Commune people's committees	These mitigation measures are simple, easy to implement, do not need the technology or complex technical. However, there must be a commitment by construction contract between building contractors and project management unit. Noise impacts can only mitigate, not being able to completely overcome.
8. Materials waste arising from the construction activities on site and from activities of workers	+ Cleaning and carrying the waste from the construction to the dump regularly (1 disposal) + Put the trash in the proper position in the field and worker's camps. + 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	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 oil waste. It should have the consistency between the construction contractors. There should be a strict sanctions and the closely monitored

Potential impacts	Mitigation measures	Effectiveness Advantages / disadvantages
9. The temporary dump materials such as dust, noise impacts on water quality	+ 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;	These measures are highly effective, feasible, easy to implement, and do not need complex technology or technique. These measures shall require the responsibility of construction units as well as the full assessment before starting construction. Therefore, measures to punish and monitor closely should be needed.
10. The impacts at landfill	- Construction units have to level, move and compact carefully - Planting on the surface of disposal sites after completing the project to create a stable, prevents the soil, and prevent the disposal area from the landslide phenomena.	These mitigation measures are simple, easy to implement, and do not need the complex technology and technique.

Table 7 - 4: Measures to minimize the social impact of the sub-project during construction period

Potential impacts	Mitigation measures	Effectiveness Advantages / disadvantages
1. Irrigation channels and reservoir construction interrupt supplying water for downstream and rice fields	+ 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.	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.
2. Dam safety risk	+ Most of the activities that upgrading the dam, drain water should be carried in the dry season.	Highly effective, without complex technology or technique, and low budget.

Potential impacts	Mitigation measures	Effectiveness Advantages / disadvantages
	+ Speed up the construction	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.
3. Obstruct traffic, increase risk of traffic accidents and reduce the ability to access to social services (schools, markets, health centers ...) in the subproject area	+ 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	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 prevented. However obstructing traffic and reducing the ability to access to social services can only mitigate, not being able to completely overcome.
4. Constructive workers temporary stay in the locality may cause social problems, affecting the lives of people	+ Consult local authorities about rent house for workers instead of setting up camp. It has more advantages in solid waste management. + Orientate workers how to communicate with the community, guiding them about protecting their health, sanitation, prevention of infectious diseases. + Orientate workers how to prevent infectious diseases such as HIV / AIDS, other social evils such as gambling, whoredom, theft, etc. + Workers should be strictly banned to exploit the local resources.	These measures are workable, 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.
5. The threats to the worker's health	Safety measures in the construction area: + Safe staff should be arranged to implement safety measures at	The above measures can fully implement and they will have highly effective if they are in full

Potential impacts	Mitigation measures	Effectiveness Advantages / disadvantages
and labor safety in the project area	construction sites. Safe staff should be trained in emergency first aid; + Provide adequate equipment and personal safety for employees (such as helmets, gloves, belt, etc.) and training them to use; + Install safety regulation table in the field. + Install fencing around the construction. Reduce the risk from material transport processes along the route: + The speed should be limited along the route (management road and dam) but it should be compliant with the residential areas and intersection segments. + 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;	compliance with the above provisions. However, it depends largely on the self-consciousness and the observance of workers.

7.2.1.3 Mitigation measures in operation phase

Table 7 - 5: Measures to minimize the environmental and social impact of the sub-project during operation

Potential impacts	Mitigation measures	Effectiveness Advantages / disadvantages
1. Natural disaster cause the insecurity	+ Ngoi La 2 operational management unit – Ngoi La 2 irrigation works management periodically checked the safety of the reservoir. + Ngoi La 2 operational management unit closely coordinates with the CPC 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 regulatory, flood discharge in the case of large flood affecting downstream	- Managerial and operational unit 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 government should have an active plan to cope with the disaster.	This measure has the highly feasible. However, the monitoring system should be equipped to support operating officers in the forecast work.

7.2.2 Estimated cost of mitigation measures

Table 7 - 6: Mitigation measure and estimated cost

Subproject's stage	Subproject's activities	Environmental and Social Impacts	Measures to minimize the adverse impacts	Implementation expenses	Time of implementation and operation	Implementation responsibility	Supervision responsibility
Pre-construction	Permanent or temporary land acquisition of living or agriculture land	Loss a part of livelihood opportunity of local residents.	+Compensate for household/landowner according to price frame of Tuyen Quang province and harmonies with WB's policies as defined in RAP +Stakeholder and beneficiaries consultation must be done +The tally work of damage complies with regulations, especially must have the participation of direct affected people	Provincial budget	Before implementing subproject. Expected in month	PMU coordinates with Compensation and land clearance committee of Yen Son district	PMU and Department of Agriculture and Rural Development People's Committee of Yen Son district
	Transport of waste	- Increase traffic accident risk. - Arising dust, noise on the road.	- Equip 10 tarpaulins for lorries that have no tarpaulins or replacing for old tarpaulins. + Guarantee the means and construction equipment have been maintained in good condition. + In sunny season, the material	2million VND/tarpaulin x 10 tarpaulins = 20million Spraying water: 5 million Speed limitation signs: 4 signs x 1	Every day	Execution Unit	Project Owner

Subproject's stage	Subproject's activities	Environmental and Social Impacts	Measures to minimize the adverse impacts	Implementation expenses	Time of implementation and operation	Implementation responsibility	Supervision responsibility
			transport means must be spay water on the road when they moving through crowded residential area, schools... in the rush hours. + Assign speed limitation (15km/h) and guide drivers familiarize and obey. + The contractor will propose execution plans that approved by PMU to reduce the time of land clearance, construction and temporary storage of material.	million/sign = 4 million			
	Assembling means, machines	-Noise, dust waste, space withholding	- Make movement plan, assemble equipment reasonably to avoid effect on local people's life		Project preparation phase	Execution Unit	Project Owner
	Workers reside temporarily in the project area	Causing the disorder in local people's life	+ Register temporary residence for workers + The contractor guides the communication way with local community and authorities for workers	Contractor	When workers start living at local communication	Contractor	Supervision consultant

Subproject's stage	Subproject's activities	Environmental and Social Impacts	Measures to minimize the adverse impacts	Implementation expenses	Time of implementation and operation	Implementation responsibility	Supervision responsibility
			+ The contractor develops and requires workers to obey rules/regulations when living in the local region (no quarrel with the local people, any gambling and theft, etc…)				
Construction period	Construction activities of project works	- Decline the air environment quality by dust, noise and vibration	- Non-use the equipment are too old, maintain periodically machines and equipment 6months/time	15million/ time * 1 time/1 year = 30million.	Regularly during construction time	Construction company	Project Owner
			- Spraying water periodically on the construction area and along the execution road line	Change by day			
			- Cover canvas for materials storage yards and means transport material.	10 million			
		- Arising construction solid waste, scattered sandy soil, hazardous waste (waste machine oil, greasy clouts) cause environmental pollution, decline bio diversification	- clean up and treat the volume of dug sandy soil and weathered soil scatters on the ground	30 million	Doing day by day	Construction company	Project Owner
			- At each construction site places 02 dustbins keep hazardous waste; and 02 dustbins keep normal waste	1 million /dustbin x 04 bins x 1 placing point = 4 million	Purchasing before deploying subproject	Construction company	Project Owner

Subproject's stage	Subproject's activities	Environmental and Social Impacts	Measures to minimize the adverse impacts	Implementation expenses	Time of implementation and operation	Implementation responsibility	Supervision responsibility
			- Regularly collect and clean scattered materials - Classify solid waste and put rightly to bins as per required - Collect and treat rightly hazardous waste as per regulation	Service fee for waste collection and treatment 20million/year * 2 years = 40 million.	Doing day by day	Construction company	Project Owner
		Overflowed rain-water, washing water means and materials	- 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.	Constructing before deploying execution	Construction company	Project Owner
					Implementing day by day	Workers in the project site	Project Owner
		- Impact to labor safety, working condition, worker's heath at the construction site.	- Arrange the reasonable working schedule - Equip sufficiently labor safety instruments for workers - Hold the training, capacity building on labor safety and environmental protection before construction. - Organize periodic medical checkup for workers on the	- Equip labor safety instruments: 20 million/year * 2 years = 40 million. - Organize training on labor safety: 30 million/course *2	Implementing during construction process	Construction company	Project Owner

Subproject's stage	Subproject's activities	Environmental and Social Impacts	Measures to minimize the adverse impacts	Implementation expenses	Time of implementation and operation	Implementation responsibility	Supervision responsibility
			construction site	course/year*2 years = 60 million. - Arrange periodic medical checkup: 20 million/year *2 year = 40 million.			
		- Environmental problems: natural calamity, rainstorm, oil leakage, combustion, detonation, etc…	- Make prevention plan of storm, tropical low pressure, and whirlwind. - Disseminating the response plan. - Organizing maneuver.		Annually	Appropriate authorities	Project Owner
	Production activities of concrete components	- Soil and water pollution by water washing machine equipment.	- Economical use of water source - Constructing wastewater collection system, accumulation pit for treatment before discharge to environment	Same expenses for construction accumulation pit	Building before deploying subproject	Construction company	Project Owner
		- Dust, exhaust fumes, noise due to mix and pour concrete	- Maintain machines periodically		Periodically every month	Construction company	Project Owner
	Materials transportation activity	- Air pollution by noise, dust, exhaust fumes of transport means	- Transport in the regulated time - Carry loading capacity rightly	02 million/canvas x 20 canvases = 40 millions	Everyday	Construction company	Project Owner

Subproject's stage	Subproject's activities	Environmental and Social Impacts	Measures to minimize the adverse impacts	Implementation expenses	Time of implementation and operation	Implementation responsibility	Supervision responsibility
		- Impact to traffic infrastructure of region - Increase risks in traffic accident for people travel on road	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.				
	Life activities of staffs and workers	- Arising domestic wastewater	Make contract to purchase 03 mobile toilets.	20million/toilet x 3 unit = 60million	Purchasing and installing before deploying subproject	Contract with distribution agency	Project Owner
		- Domestic waste	- Equip 03 dustbins to collect rubbish at the tents - Clean up regularly - Contract with environmental sanitation agency of local to transport and treat waste	2million/dustbin x 03 bins x 01 tent = 6 million - The transport and rubbish treatment fee 20million/year *2years = 40 million	Purchasing and make the contract for collecting rubbish before implementing project	Construction company	Project Owner
	Repair and return the road lines that have been damaged	- Protect traffic road line in the project area	- Repair, leveling and improve the damaged, depressed and low quality road lines	80 millions	Doing immediately after finishing construction period	Construction company	Project Owner
	Observation and	- Guarantee	- Take the sample for	66 millions	Implementing	Agency has	Project

Subproject's stage	Subproject's activities	Environmental and Social Impacts	Measures to minimize the adverse impacts	Implementation expenses	Time of implementation and operation	Implementation responsibility	Supervision responsibility
	supervision environment during construction time	environment quality of project region as per permitted standard	observation and monitor environment quality at construction site (18 months)		during construction period periodically 3-6 months/time	sufficient legal status and to be hired by project owner	Owner
Operation period	Return whole construction area: tent area, dumping ground, soil exploitation area	- Arising solid waste	- Dismounting tents, signs - Gathering, and selling for user. -Assembling and movement of machines, construction equipment. - Fill up and leveling the ground of explosion field.	50million	Implement when the construction phase finishes	Construction company	Project Owner
	Management, operation, maintenance water inlet sluices	- Safety guarantee for residential area, cultivated land, works and infrastructure	- Organize to inspect the maintenance regularly and periodically. - Discover and tackle opportunely the encroachment and use canal line out of purpose.	Subproject's maintenance budget	Annually	PPMU	Project Owner
	Training, prevention of problem	- Serving inspection mission, discovering opportunely, rescuing when the problem happens	- Arrange the training on coping with unexpected events with frequency of 1 time/year according to proposed program of Department of Agriculture	Subproject's operation budget			

Subproject's stage	Subproject's activities	Environmental and Social Impacts	Measures to minimize the adverse impacts	Implementation expenses	Time of implementation and operation	Implementation responsibility	Supervision responsibility
			and Rural Development (DARD).				
	Dredge irrigation	- Avoid the accumulation state that pollutes water environment and change hydrology regime due to the narrowed river/canal bed	- 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	Subproject's operation budget			
	Operating close and open sluice gate	- Cause the interior field water stagnant that effect to surface water quality	- Regularly monitor the salty level, regional hydrology regime - Operate water inlet sluice flexibly and timely	Subproject's operation budget			
	TOTAL ESTIMATED COST			626,000,000đ			

7.3 ENVIRONMENTAL AND SOCIAL MONITORING PLAN (ESMoP)

7.3.1 Environmental Monitoring Program

i) Environmental monitoring program in construction period

Table 7 - 7: Environmental monitoring in construction period

No	Type	Position	Frequency	Norm	Compared standard
I	Monitoring of waste sources management				
1	Potential source	Tents of workers Dumping ground	3 months/time	Volume of solid waste The number of latrines, tents and waste water treatment systems Volume of harmful waste Waste's components;	
2	Management measures of potential waste	Construction sites, Tents of workers Dumping ground	3 months/time	Amount of dustbins Receipts of collection and transport services.	
II	Monitoring the impacts to natural environment				
1	Air	1. The earth dam execution area (KK01); 2. Spillway construction area (KK02); 3. Management road construction area (KK03)	6 months/time 2 times/day in each time	- Condition of micro climate, temperature, moisture, wind speed - Noise level LAeq - Indecisive dust TSP - Respiratory dust (PM10)	NTR 05:2013/BTNMT National Technical norm in surrounding environment quality NTR 26:2010/BTNMT National Technical standard on noise. NTR 27:2010/BTNMT National Technical norm on vibration.

No	Type	Position	Frequency	Norm	Compared standard
2	Surface water	1. Surface water in river bed (NM01) 2. Surface water in water inlet sluice (NM02) 3. Surface water after dumping ground (NM03)	6 months/time	- pH - DO - TSS - COD - Coliform	NTR 08:2008/BTNMT: National Technical norm on surface water quality.
3	Ground water	dumping ground rearwards (NN01)	6 months/time	- Hardness (CaCO3) - TDS, TS - Iron (Fe) - NH^{4+} followed N. - E.coli	NTR 09:2008/BTNMT: National Technical norm on ground water quality
4	Soil	1. Surroundings of dumping ground (MĐ 01) 2. Surroundings of the construction materials storage ground (MĐ02)	6 months/time	- Asen (As) - Cadimi (Cd) - Copper (Cu) - Lead (Pb) - Zinc (Zn)	NTR 03:2008/BTNMT: heavy metal limit in soil. NTR
5	Landslie, erosion	Spillway construction	1 time in quarter 6	Scale of landslide; Landslide level	

ii) Environmental monitoring program in operation period

Table 7 - 8: Environmental monitoring in operation period

No	Type	Position	Frequency	Norm	Compared standard
1	Surface water	1. Surface water at water inlet sluice (NM04); 2. Surface water at canal 2 (NM05)	6 months/time	- pH - DO - TSS - COD - BOD_5 (20^0C) - NO_3^- (according to N) - PO_4^{3-} (according to P) - As - Total lubricant	NTR 08:2008/BTNMT: National Technical norm on surface water quality.

				- Coliform - Surplus vegetable protection medicine group Cl - Surplus vegetable protection medicine group Phosphorus	
2	Landslie, erosion	At downstream of spliiway	In flood season 02 years after operation	Scale of landslide; Landslide level	

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
	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 A5

7.3.3 Estimated cost for enviromental 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)
I	**Monitoring waste source management**				**10,000,000**
1	*Arising source*	*Time*	*1*	*5,000,000*	*5,000,000*
2	*Measures to manage emission*	*Time*	*1*	*5,000,000*	*5,000,000*
II	**Monitoring impacts to natural environment**				**19,520,000**
1	Air analysis				1,590,000
	Microclimate condition: temperature, moisture, wind speed	*Sample*	*1*	*40,000*	*40,000*
	Noise level LAeq	*Sample*	*1*	*60,000*	*60,000*
	Suspended dust TSP	*Sample*	*1*	*65,000*	*65,000*
	Respiratory dust PM10	*Sample*	*1*	*100,000*	*100,000*
	Total cost of analysis 01 sample	*Sample*			***265,000***
	Analysis cost 3 points x 2 samples/day	*Sample*	*6*	*265,000*	*1,590,000*
2	Surface water analysis				**1,710,000**
	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*
	COD	*Sample*	*1*	*70,000*	*70,000*
	Total lubricant (oils & grease)	*Sample*	*1*	*300,000*	*300,000*
	Coliform	*Sample*	*1*	*60,000*	*60,000*
	Cost for analysis 01 sample	*Sample*			*570,000*
	Total cost for analysis 3 positions x 1 time	*Sample*	*3*	*570,000*	*1,710,000*

3	Ground water analysis				**580,000**
	pH	*Sample*	*1*	*30,000*	*30,000*
	Hardness	*Sample*	*1*	*60,000*	*60,000*
	Total dissolved solid (TDS)	*Sample*	*1*	*50,000*	*50,000*
	Amoni (NH4+)	*Sample*	*1*	*60,000*	*60,000*
	Asen (As)	*Sample*	*1*	*80,000*	
	Lead (Pb)	*Sample*	*1*	*60,000*	*60,000*
	Iron (Fe)	*Sample*	*1*	*60,000*	*60,000*
	Total Coliform	*Sample*	*1*	*60,000*	*60,000*
	Cost for analysis 01 sample	*Sample*			*380,000*
	Total cost for analysis 1position x 1 time	*Sample*	*1*	*380,000*	***380,000***
4	Soil analysis				**640,000**
	Asen (As)	*Sample*	*1*	*80,000*	*80,000*
	Cadmi (Cd)	*Sample*	*1*	*60,000*	*60,000*
	Copper (Cu)	*Sample*	*1*	*60,000*	*60,000*
	Lead (Pb)	*Sample*	*1*	*60,000*	*60,000*
	Zinc (Zn)	*Sample*	*1*	*60,000*	*60,000*
	Cost for analysis 1sample/ 1 position	*Sample*			*320,000*
	Total cost for analysis 2 positions x 1time/day	*Sample*	*2*	*320,000*	***640,000***
5	Monitoring landslide	Time	1	15,000,000	**15,000,000**
III	**Monitoring social impacts**				**5,000,000**
	Social impact	Time	1	5,000,000	5,000,000
IV	**Monitoring environmental sanitation and labour safety**				**10,000,000**
	Environmental sanitation	Time	1	5,000,000	5,000,000
	Labor safety	Time	1	5,000,000	5,000,000
V	**Expenses 3 staffs x 3 days**		**9**	**350,000**	**3,150,000**
VI	**Car for sampling analysis (fixed price, estimated 5 million 1time)**	**Time**	**1**	**5,000,000**	**5,000,000**
VII	**Make monitoring report for each time**	**Set**	**1**	**4,000,000**	**4,000,000**
VIII	**Total estimated cost for monitoring 1 time (plus I-VII)**	**Time**	**1**		**56,670,000**
IX	Total estimated monitoring cost 1,5 years (3 times)	Time	3	56,490,180	170,010,000
X	GENERAL MANAGEMENT COST: TT*20%		C		34,002,000
XI	Total cost before tax		TC		204,012,000
XII	Tax GTGT: (VAT)= 10% x (TC)		VAT		20,401,200

XIII	Cost for environmental monitoring in construction period		G		224,413,200
	Round number				**223,413,000**

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)
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
	COD	Sample	1	70,000	70,000
	BOD_5 (20^oC)	Sample	1	80,000	80,000
	NO_3^- (according to N)	Sample	1	60,000	60,000
	PO_4^{3-} (according to P)	Sample	1	60,000	60,000
	Asen (As)	Sample	1	80,000	80,000
	Total lubricant (oils & grease)	Sample	1	300,000	300,000
	Coliform	Sample	1	60,000	60,000
	Surplus vegetable protection medicine group Cl	Sample	1	600,000	600,000
	Surplus vegetable protection medicine group phosphorus	Sample	1	600,000	600,000
	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)
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 2years (4 times)	Time	4	38,300,000	153,200,000
VIII	GENERAL MANAGEMENT COST: TT*20%		C		30,640,000
IX	Total cost before tax		TC		183,840,000
X	Tax GTGT: (VAT)= 10% x (TC)		VAT		18,384,000
XI	Cost for environmental monitoring in operation period		G		202,224,000
AROUNDED NUMBER					202,224,000

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

Content		Trainees	Quantity	Cost (VND)	Fund
	Raising awareness and accessing to the environmental legal system	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
	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 (VNĐ)				28,000,000	

Table 7 - 14: Summary of total cost for conducting Environmental and Social Monitoring Plan

No	Monitoring content/ Implementing period	Implementing responsibility	Cost (VND)
I	Construction period	The agency has sufficient legal status and hired by Project Owner	223,701,000
II	Operation period	PPMU	202,224,000
III	Training, capacity building	PPMU	28,000,000
	Total (I+II)		453,637,000

7.3.5 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 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	- Assessing implementation results of measures to minimize environmental and social impacts of construction contractors	Every month	Subproject Management Committee

Implementation responsibility	Type of report	The content of report	Frequency for submit the report	Submit to
		- Results of solving and overcoming problem and shortcomings from previous report		
Independent environmental consultant	Independent monitoring report on environmental and social safety	- 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 IMPLEMENTATION ARRANGEMENT ESMP

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.

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, Ngoi La 2 reservoir is under management of Reservoir's Management Board. However, staff 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 pountries 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 reseservoir 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 ASSESSMEN

Characteristics of community, including infrastructure, social service, economy, basic need of people, chance to approach to science- technique, willing to absorb development support policies, etc. will involve in decision of community development need.

Through the approaches to livelihood resources of households, SA of the project has made an analysis of the socio-economic characteristics of surveyed households according to the human resources (demographic and labor, education, occupation, health), natural capital (productive land: agricultural land, forest land and aquatic land, land use), physical capital (housing, property for living, property for production and business), financial capital (income, changes in living standards, poverty, loans), and social capital (community relations, relatives, authorities and their support) and consider the impact factors including the potential impacts of the project. These resources have been analyzed with the integration with elements such as Gender, ethnic minorities and vulnerability.

In general, the livelihood of people living in 5 communes benefiting from the surveyed project area is mainly agriculture, commonly two rice crops and one secondary crop a year. Therefore, the safety of dams and water stability for irrigation is very important for agricultural production in the residential areas, while there is a high demand of water for agriculture activities in most surveyed areas but actually it is not proactive.

In surveyed area, agriculture is the main production activities, the basic livelihood of the people, so that land is the main production resource of farmers. Of which, 99.5% HHs have residential land, 95.2% HHs have paddy land, 49.2% HHs have land for vegetables, 23.3% of HH have land to plant industrial trees and 15.3% of HHs have ponds and water surface.

Project area is rural and mountainous region, natural conditions are not favorable. However, the need for basic social services supply has been met. The needs of the community towards the development of material and spiritual life of people through capacity building, awareness, participation enhancement, solidarity and close cooperation among people together, among people and organizations and among organizations together within a community is quite high. This is one goal toward of the project.

7.5.1 Improving crop yields

When the subproject operate, it will ensure the irrigation frequency of 75%, contribute to ensure production area of rice and vegetables. Simultaneously, the implementation of subproject is also an opportunity to the people in the downstream area more access to measures, new techniques in agricultural production. In which, the technical guidance of integrated crop management (ICM) base on cropping system with rice (rice-maize, rice-soybean and rice-groundnut) will contribute to raising productivity, yield and economic efficiency for the downstream area.

ICM is a manufacturing process in order to provide an adequate supply of food and other products in an efficient manner, to minimize consumption of material resources, to safeguard the quality of soil, water, air and biodiversity.

Features of ICM:

- Achieve the highest economic benefit with the proper use of energy and chemicals;
- Use useful interaction of the inputs of production;
- Promote the development of natural enemies and create conditions for cultivation to limit the development of disease and pest.
- Improve soil fertility by the crop rotation and the cultivation methods;
- Maintain or increase profits, to emphasize net interest rather than the relative level of productivity;

- Reduce the lowest risk to the environment;
- To delay or avoid the proliferation of diseases, pest, weeds that resist plant protection chemicals or biological farming.

Benefits of ICM:

- Give opportunities, difficulties and major problems for growers;
- Improve the quality of agricultural products on markets;
- Diversify agricultural products to meet needs of the market;

7.5.2 Public communication

1 To minimize the negative impacts caused by the implementation of the subproject as well as maximizing the positive effects, the Contractor will coordinate with local government to organize consultation meetings with the participation of stakeholders to disseminate information about the subproject, sharing all information on items and activities of the project for the affected people, gather information about the needs and priorities of those affected as well as get information about their response about policies and the proposed activities, to ensure that those affected can be fully informed decisions that directly affect the income and their life. They have the opportunity to participate in activities and decision-making on issues that directly affecting them. A full communications plan will be presented in Appendix B3 of this report.

PART 8
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 SOCIAL IMPACT ASSESSMENT CONSULTATION

i) The consultation attendance:

- 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, grievance mechanism and solution, compensation policy for each type of land, architectural works and plants, farm produce
- The consultant presents impacts forecast of subproject to resettlement, gender;
- The stakeholders discuss policies in interests and compensation to the effects on land, works, architecture, plants and farm produce.

iii) Consultation method

Immediately starting project preparation, local authorities leadership at all levels of Trung Mon commune, Yen Son district, and Tuyen Quang 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 results:

Participated	Location	Time	The number of	Number of

commune			participated people	female
Trung Mon	House of culture, hamlet 1, Trung Mon commune	14h dated 23/1/2015	17	6

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 Tuyen Quang 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 Trung Mon commune. For this result there is no negative impact to ethnic minority.
- Woman merchandising situation does not occur in the project area.
- The affected people understand positive and negative impacts of subproject to local; therefore, they get fully unanimity with the project development and they hope the subproject will be deployed soon.

8.3 ENVIRONMENTAL SOCIAL IMPACT ASSESSMENT CONSULTATION

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) Consultation measures

Arrange the meeting with the above participant includes: local authorities, local organizations, and affected people. To create condition for the local people express their opinions, aspirations, the consultation meeting to be held expansively and under questionnaire in status and consequence of happened natural calamity phenomenon in

there having expression aspiration and requirement of interviewed organization or individual with subproject.

iii) Consultation results:

Participated commune	**Location**	**Time**	**The number of participated people**	**Number of female**	**Consultation's contents**
Trung Mon	House of culture, hamlet 1, Trung Mon commune	10h dated 23/1/2015	38	17	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
Kim Phu	House of culture, hamlet 23, Kim Phu commune	14h dated 23/1/2015	30	6	

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 summarized as follows:

- The People's committee of Yen Son district and Commune People's Committee and Fatherland Front Board of communes totally support the development of subproject. 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 favorable 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 Yen Son 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 commitment 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 summarized 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 corresponding 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 sup project supports for the improvement and dredge the irrigation canal system from Ngoi La reservoir to ensure irrigation water;
- The local people are worried about the widening of aquaculture activity on Ngoi La reservoir after it has been upgrading and improvement that causes the decline of water quality in reservoir, water source pollution risk, and 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.

8.4 ESIA DISCLOSURE

According to WB's policy on approaching information, all draft documents of subproject (ESMP; ESMoP, EIA, EMP, ECOPs, etc.) must be announced widely at the local, websites of WB and these documents must be displayed at the easy view positions, succinct and easily understandable edit.

CONCLUSION, RECOMMENDATION AND COMMITMENT

1. Conclusion

(i) The subproject belongs to Group B in environment as per environmental World Bank Safeguard policies ;

(ii) The subproject does not locate in sensitive position with environment and it does not commit any criterion "ineligible" of WB;

(iii) 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;

(iv) 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;

(v) The subproject upgrading and safety guarantee of Ngoi La 2 reservoir, Tuyen Quang province has been owned by Department of Agriculture and Rural Development and managed by Water resources development and management Board of Tuyen Quang 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, the land clearance cause permanent effect to 22,100 m^2 land surrounding Ngoi La 2 reservoir area and using temporarily 2,000 m^2 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 unsafely 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 Ngoi La 2 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 submits to Central Projects Organization (CPO).

2. Recommendation

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

(i) The mitigation measures mentioned in ESMP will be set up as an inseparable part 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 of Contractor.

(ii) Based on the Environmental and Social Impact Assessment, safeguard policies consultant and Subproject management Board petition appropriate authorities and WB for approval ESIA of the subproject upgrading and safety guarantee of Ngoi La 2 reservoir project, Tuyen Quang province to be the basis for deploying next steps and guarantee subproject schedule./.

3. 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 Onwer 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 unfencing upon international Convention, Vietnam standards on Environment and when occurrence the environmental problem.

4. Project Owner commits to strictly conform to legal regulations on compensation, surmounting environmental risks in case of the environmental risks occur due to the subproject development.

REFERENCES

1. Feasibility Study report (FS) of subproject upgrading and safety guarantee for Ngoi La 2 reservoir, Tuyen Quang province;
2. Resettlement Action Plan Report (RAP) of subproject upgrading and safety guarantee for Ngoi La 2 reservoir, Tuyen Quang province;
3. Social impact assessment report of subproject upgrading and safety guarantee for Ngoi La 2 reservoir, Tuyen Quang province;
4. Dam safety report of subproject upgrading and safety guarantee for Ngoi La 2 reservoir, Tuyen Quang province
5. Summary report of social economic situation of Trung Mon commune, Yen Son district, Tuyen Quang province in 2014;
6. The result of current environment analysis subproject upgrading and safety guarantee for Ngoi La 2 reservoir, Tuyen Quang province
7. Maps:

   - Map of subproject area

   - Map of current situation and land use planning of subproject area.

APPENDICES

APPENDIX A – ENVIRONMENT

Appendix A1- DRAWINGS OF THE MAIN WORKS

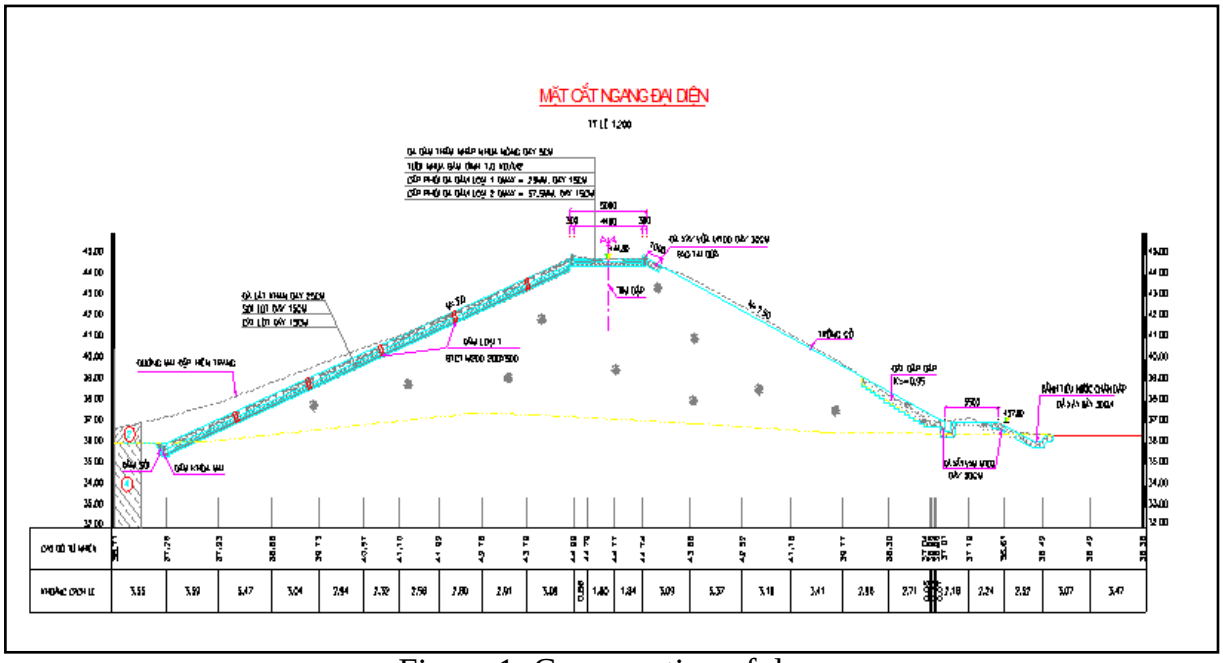
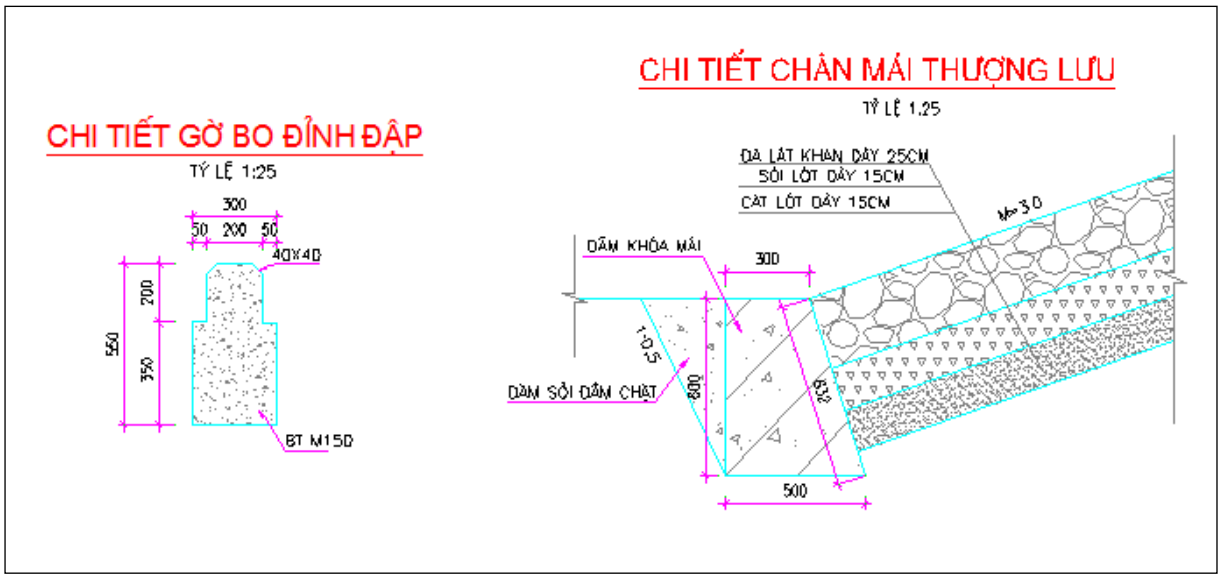
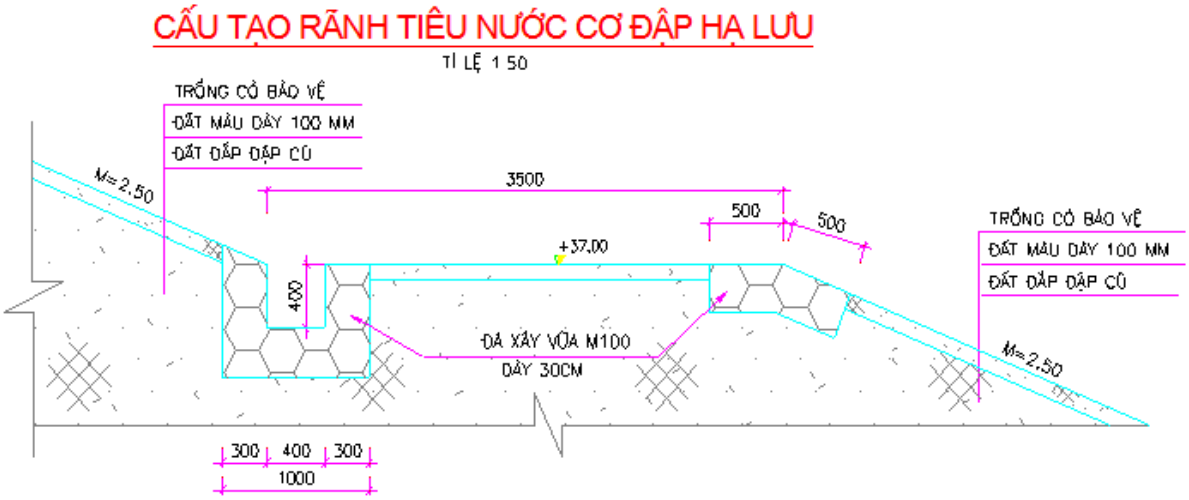


Figure 1: Cross section of dam




CẤU TẠO RÃNH TIÊU NƯỚC CƠ ĐẬP HẠ LƯU
TỈ LỆ 1 50
TRỒNG CỎ BẢO VỆ
ĐẤT MÀU DÀY 100 MM
ĐẤT ĐẮP ĐẬP CŨ
M=2.50
3500
500
500
+37.00
400
ĐÁ XÂY VỮA M100
DÀY 30CM
TRỒNG CỎ BẢO VỆ
ĐẤT MÀU DÀY 100 MM
ĐẤT ĐẮP ĐẬP CŨ
M=2.50
300
400
300
1000

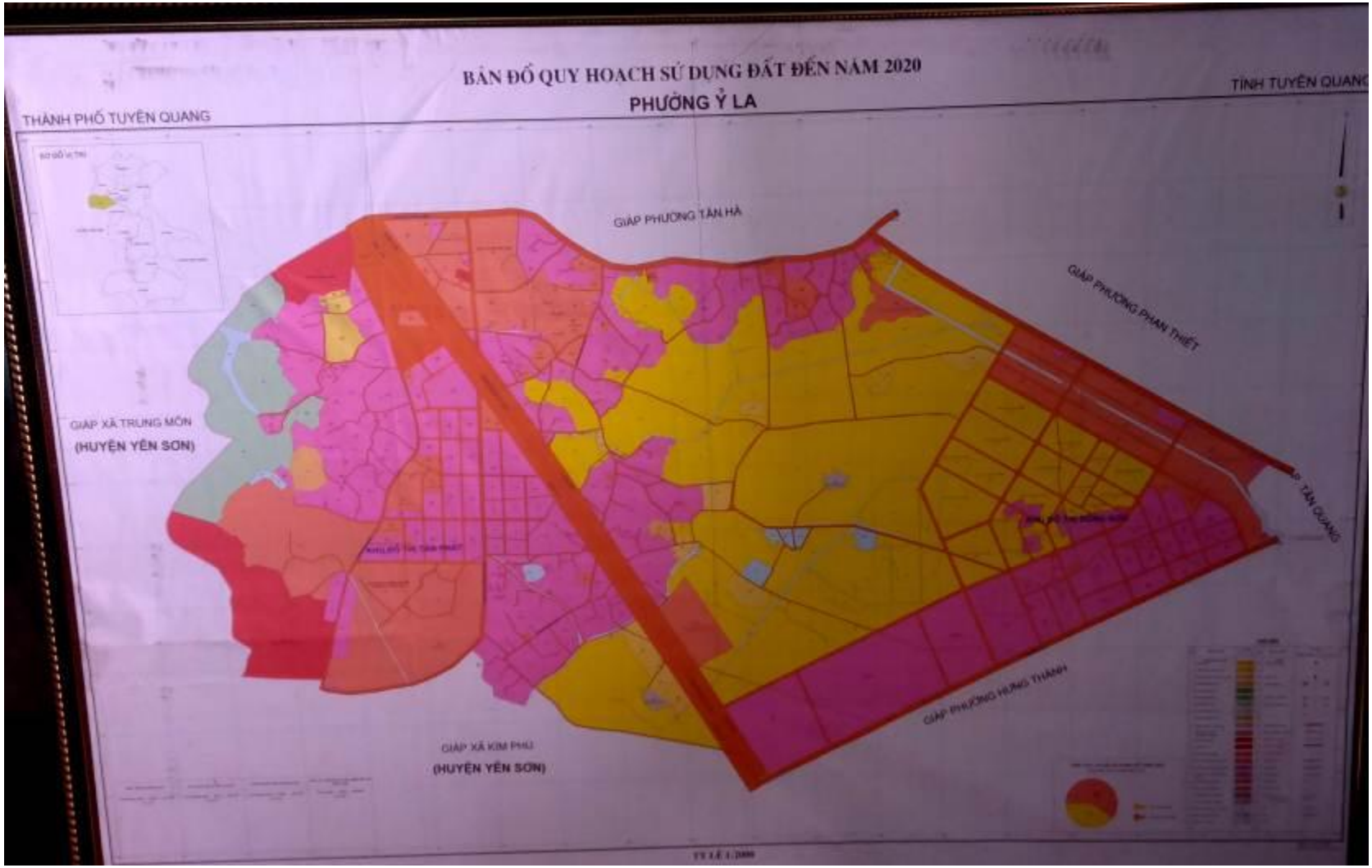
Appendix A2- TYPES OF MAP

Annex A2.1: Map of subproject location

Annex A2.2: Map of current land use of subproject location

Kim Phu commune

Ỷ La ward


BẢN ĐỒ QUY HOẠCH SỬ DỤNG ĐẤT ĐẾN NĂM 2020
PHƯỜNG Ỷ LA
THÀNH PHỐ TUYÊN QUANG
TỈNH TUYÊN QUANG
GIÁP PHƯỜNG TÂN HÀ
GIÁP PHƯỜNG PHAN THIẾT
GIÁP XÃ TRUNG MÔN
(HUYỆN YÊN SƠN)
GIÁP XÃ KIM PHÚ
(HUYỆN YÊN SƠN)

Appendix A3 - POLICY FRAMEWORK, INSTITUTION AND REGULATION

Legal framework related to 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.

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

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

- Law on Construction No. 50/2014/QH13 approved by Vietnam National Assembly dated 18/08/2014;
- Decree No. 15/2013/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/ND-CP dated 10/02/2009 on managing the construction and investment projects.

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

- Law on Water Resources approved by Vietnam National Assembly dated 21/06/2012;
- Decree No.42/2012/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.

National Policy on 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 Electric Generation Reservoirs.

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/QD-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 labours who have land recovered.

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

- Decision No.19/2009/QĐ-UBND dated 29/10/2009 of Tuyen Quang province on issuing the policies of compensation, support and resettlement in cases of land recovered within Tuyen Quang province.
- Decision No. 14/2011/QĐ-UBND dated 23/08/2011 on revising and supplement some Article of Decision No.19/2009/QĐ-UBND dated 29/10/2009 regulating the prices of compensation, support and resettlement in cases of land recovered within Tuyen Quang province.
- Decision No.40/2013/QD-UBND of Tuyen Quang province dated 21/12/2013 on adjusting the unit price of land types in Tuyen Quang province 2014.
- Decision No. 22/2011/QD-UBND dated 31/10/2011 on adjusting the unit price for compensation of houses, structures, crops, trees and other assets in cases of land recovered for the purposes of defense, security and public construction serving the community welfare and economic development in Tuyen Quang province.
- And other legal documents related to compensation, support and resettlement of Tuyen Quang province.

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 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.

Policy for Ethnic Minority community development

- Decree No. 82/2010/ND-CP dated 20/7/2010 of Government on teaching and learning the ethnic language in the schools.
- Decree No. 60/2008/NĐ-CP dated 9/6/2008 of Government regulating the functions, tasks, responsibilities and organization structures of Ethnic Committee.
- Decision No. 06/2007/QD-UBDT dated 12/1/2007 of Ethnic Committee approving Communication Strategy for 135 Program – phase 2.
- Decree No. 70/2001/ND-CP: all registration documents of family assets and land use rights must be filled the names of both husband and wife.
- Decision No. 134/2004/CP dated 20/7/2004 of Government on policy of supporting productive land, residential land, house and domestic water for the poor and difficult ethnic households.
- Decision No. 03/2005/QĐ-BNN dated 07/01/2005 of Minister of MARD regulation the wood exploitation to support house construction of the poor and difficult ethnic households in line with Decision No. 134/QĐ-TTg dated 20/7/2004 of Government.
- Decision No. 33/2007/QĐ-TTg, dated 05/3/2007 of Government on the support policy on immigration and sedentariness for ethnic minorities;
- Decision No. 32/2007/QĐ-TTg dated 05/3/2007 of Government on the loans for production development of especial difficult ethnic households.
- Decision No. 1592/QĐ-TTg dated 12/10/2009 of Government on continuing implementation of some policies to support productive land, residential land, house and domestic water for the poor and difficult ethnic households.
- Decision No. 05/2007/QD-UBDT dated 06/9/2007 of Ethnic Committee approving three Ethnic Minority regions and mountainous region based on the development situation.

- Circular No. 06 dated 20/9/2007 of Ethnic Committee guiding the support services for livelihood improvement of local people, technical assistant to improve knowledge on Law enforcement in line with Decision No. 112/2007/QD-TTg.

Poverty reduction policy

- Decision No. 33/2007/QD-TTg dated 20/7/2007 of Prime Minister on the support policy to improve knowledge of Law enforcement within 135 program-phase 2.
- Decision No. 1956/2009/QD-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.

Some legal documents related to sub-project preparation

- Decision No. 1511/QĐ-UBND dated 5/12/2013 approving bidding plan for bidding package: Consulting on dam safety inspection for reservoirs of Tuyen Quang province aiming to review reservoir safety (including Ngoi La 2 reservoir).

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 petiscide 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: 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?			
- Loss or degradation of land and water areas where (i) has the native species, and (ii) human activity has not significantly alter the fundamental ecological functions of the project area		✓	On upstream slope, 140m and 230m from the right side of the dam, there are many plants encroaching into the reservoir (figure 5-1, appendix 10), including timber trees and fruit trees such as bead tree, mango tree, guava tree, etc. It is inhabited by some insects such as mites, crickets, beetles, etc. Much plants growing on the 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. Thus trees cutting and clearance is absolutely necessary. However, the area and the number of cut trees is small, the impact of plant clearance is not significant.
- Loss or degradation of natural habitats such as: important conservation areas, areas protected by traditional local communities (e.g. sacred forest), biodiversity; rare, vulnerable, migratory or endangered species.		✓	The area should be withdrawn (temporary and permanent) to serve construction including: permanent acquisition of 22,100m^2 of land around the Ngoi La 2 construction 2 to expand spillway and upgrade management road; and temporary use of approximately 2,000m^2 of land surrounding the project area to serve as ground for construction and camps. Among permanently acquired land area: 300m^2 of residential land, 2.245 m^2 of garden land and 19.555m^2 of public land for agricultural production. Besides, an area of 1300m^2 of vacant land managed of Trung Mon CPC is used as yard for materials construction. There is no valuable crop on land but bush, grass. Disposal site located in village no. 3, Trung Mon commune has volume of about 50,000m^3. It is low-lying area adjacent to traffic road going to shooting range by one aspect, 3 remaining aspects next to planted acacia hill. Trung Mon CPC has handled this disposal site to the reservoir management board. The board will fill, level the disposal site and plant tree on it after completion of construction; Repairing, upgrading and improvement of the construction will be taken place around headwork

Screening questions	Yes	No	Description of impact
			of the reservoir, including current spillway, earth dam, and water intake and management road. These works are all located in village no.1, Trung Mon commune, Yen Son district, which is agricultural production area, there is no sensitively environmental area, such as: conservation areas, areas protected by traditional local communities.
2. Does the subproject have the potential to cause significant adverse impacts on physical cultural resources?			
Loss or degradation of the material culture resource, structures, groups of structures, characteristics, natural landscape with importance of archaeology, paleontology, history, architecture , religion, aesthetic, or other importance of culture.		✓	There is no impact to the material culture resource, because the subproject is taken place based on existing construction. Moreover, there is no property or structure relating to archeology, religion, and aesthetics in Trung Mon commune.
- May result to conflict with national law or international obligations under treaties and relating international environmental agreements, including the World Heritage Convention of UNESCO or affect to the famous, scientific and important heritage worth in tourist		✓	The project is undertaken for Ngoi La 2 reservoir, which was built in 1973. The implementation of project strictly complies with framework of national legislation and international obligations under treaties and relevant international environmental conventions.
3. Does the sub-project have potential to cause significant adverse impacts on land and related natural resources by the use of ethnic minorities?			
May result to impacts on land or traditionally owned territory, or used or customary tenure, and where access to natural resources, which is vital for the sustainability of the culture and livelihood of ethnic minorities. Likely to lead to impact on cultural and spiritual values symbolized for the land and natural resources or impact on management of natural resources and the long-term sustainability of resources affected.		✓	There are a few constructions of people. House and residents living are 300 m from the right side of the dam (the office of fisheries cooperative in the past being transferred to people). At this position as well, there is a dug well, not too far from dam crest, on promontory at the right side of water intake. The project does not acquire land or traditionally owned territory, or used or customary tenure. As mentioned above, village no. 1, Trung Mon commune, in which upgraded, repaired categories of the project located, is agricultural production area, the population is mostly Kinh people, there is no areas land and related natural resources used by ethnic minorities.
4. Does subproject have potential to cause significant adverse impacts on displaced population?			

Screening questions	Yes	No	Description of impact
Result to the displacement of people or land acquisition, property affecting their lives and difficulty in restoring livelihoods	✓		The subproject will permanently withdraw area of 22,100m^2 of land surrounding Ngoi La 2 construction to build spillway, repair earth dam and upgrade management road and temporarily use about 2,000m^2 of land within project area to arrange auxiliary categories (site ground 1,000m^2, camp, site regulation house: 1,000m^2.) The project affects to 12 HHs, among them, 01 HH has to displace with affected area of 300 m^2 of land. Land acquired from 11 HHs is mainly garden land, with area of 2,245m^2 located along the downstream slope of the earth dam. There are fruit trees on theses withdrawn land are but not so many. There is no HH affected to productive and agricultural land. The impacts on land, houses, structures and trees, crops are valued at replacement cost. Unit price issued by Tuyen Quang province is taken as the basis for calculating the cost of subprojects for compensation and receiving other support. The project cause relocation impact on 1 HH because the HH is living in reservoir. The affected structure is located in safe corridor of irrigation work. Moreover, this HH temporarily stays in the house to monitor the fish cages in program of Tuyen Quang aquaculture department. However, after consultation and survey of this household, compensation will be paid in cash because they have other place to live in. Therefore, the resettlement strategy is not necessary (detail in RAP)
5. Does subproject require construction of a large dam?			
Does the subproject require construction of a large dam: - Height of 15 meters or more - 10 to 15 meters high, with intricate designs. - Less than 10 meters high, but is expected to become the largest dam in the operation phase of the sub-projects?		✓	The largest height of Ngoi La 2 earth dam is of 15 m. However under scope of the subproject, only repairing, upgrading is undertaken, no need to construct a large dam. A dam safety report for subproject Repair and improvement for safety of Ngoi La 2 reservoir has been prepared to ensure the safety principles on the dam principles of GoV as well as the policies of WB.
The operation of the subproject depends on the efficiency of: - Existing dam or dam under construction - Power station or water supply system gets water directly from		✓	The subproject is undertaken to improve and ensure the safety of the dam and people living in downstream area of the dam. During repairing process, several categories of headwork cluster including dam, spillway, water intake, management road are upgraded to improve efficiency.

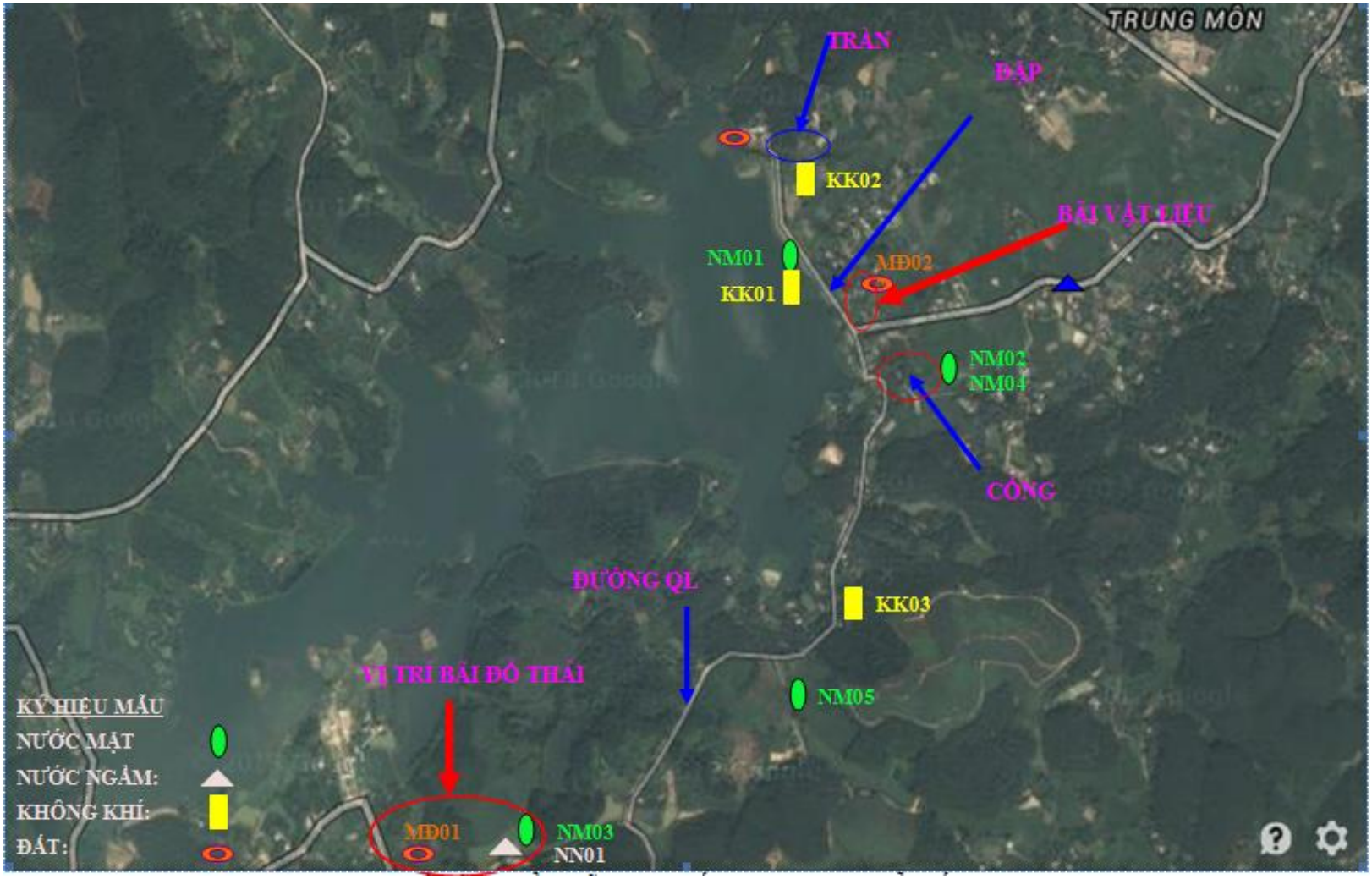
Screening questions	Yes	No	Description of impact
the reservoir by a large dam or under control of a constructed dam. - Diversion dam or hydraulic structure in downstream from an existing dam or dams under construction, where every incident of upstream dam can cause enormous harm or damage to architectural and irrigation projects or water supply projects funded by the WB, the project is dependent on the capacity and performance of an existing large dam or dam being constructed to provide water and could not function if the dam was broken.			The repairing is implementation based on current situation, capacity and irrigated areas will not be increased after investment of the project.
6. Does the subproject lead to procurement or use of pesticides?			
Does formula of the product fall into IA and IB classification of WHO, or any formula of type II?		✓	The purchase or use of pesticides is not in the investment portfolio of the subproject.
7. Does subproject have potential to cause irreversible effect or impact not easy to mitigate?			
Lead to loss of regional recharge aquifers, affecting to quality of water storage and water storage areas responsible for providing drinking water to large population centers.		✓	Catchment of the reservoir is on eastern slope of La mountain (elevation: + 860m), the elevation lowers from +200m to + 50m. Main slope direction is from west to east, southwest - northeast sided-slope direction is toward downstream of La stream; northwest - southeast sided-slope direction toward Cha stream is the main drainage direction of the catchment area. Total catchment area of Ngoi La irrigation system is 16.7 km^2 The construction and upgrading of project categories is focused in headwork area of Ngoi La 2 reservoir, on a small temporarily acquired land area, will not affect to quality of water storage areas. Temporary land use for construction including land for construction site, camp, site operation house, materials yard has total area of about 23,000 m^2 located along management route, in the bare lands. Moreover, the majority of the population in the project area (95%) use centralized water supply for living and drinking purpose, so it is not likely to affect containing water area for drinking water supply to residential areas.

Screening questions	Yes	No	Description of impact
			The subproject implementation aims to better water supply for agriculture, not affecting aquifer and water storage area related to water for living purpose.
Lead to any impact occurring in relatively long period, affecting to large geographical area or intense impact.		✓	Construction of the subproject will not last long, only 18 months. The construction activities including upgrading, repair lake Ngoi is calculated done in the dry season, the influence of water to benefit area during construction almost did not happen. The reservoir will be repaired to ensure the safety of the people behind the dam and provides stable, effective steps contribute to community economic development.
8. Does the subproject have potential to lead to a wide variety of significant adverse effects?			
Many construction sites in various locations are affected, each impact cause loss of habitat, natural resources, land or significant depletion of resources quality.		✓	To serve for construction, temporary land use includes: - Land area for construction site: Total area of 1,000 m^2 of land is prepared along management route, in bare lands. The management route passes villages no. 1, no. 3, no. 4 and no. 15 in Trung Mon commune. However, population does not concentrate next to the road but inside the village. Vegetation along both sides of the road is mostly shrubs, planted tree to make fence. - Area for camp, regulation site house: estimated area of 1,000 m^2. Land areas for auxiliary categories mentioned above are all bare lands with low value plants. The arrangement of land aims to minimize impacts of construction sites to resource and surrounding environment. - Disposal site located in village no. 3, Trung Mon commune has volume of about 50,000m^3. It is low-lying area adjacent to traffic road going to shooting range by one aspect, 3 remaining aspects next to planted acacia hill. Trung Mon CPC has handled this disposal site to the reservoir management board. The board will fill, level the disposal site and plant tree on it after completion of construction. Construction activities are undertaken in small area will not affect to living environment, resource, land

Screening questions	Yes	No	Description of impact
			or deplete resource quality significantly.
The significant potential adverse effects capable to expand beyond the construction site or works.		✓	2 routes will be used for construction: - The road connecting National road no. 2 to dam crest; - The management road connecting Ngoi La 1 reservoir and Ngoi La 2 reservoir. Dust, emission arising is likely to spread beyond the site, however in narrow scope. The project area is rural area with plentiful vegetation cover, so that dust and emission is easy to be diluted. Along with serious implementation of mitigation measure, the impact is controlled and reduced.
The impact across the border (in addition to a small change in the waterway activities are taking place).		✓	The subproject is implemented entirely in the territory of Vietnam. There is no impact across border.
The need for public road, tunnel, canal, power transmission corridor, new pipeline, or borrowed area and disposal areas in underdeveloped region.		✓	Among subproject activities, management road connecting Ngoi La 1 reservoir and Ngoi La 2 reservoir will be upgraded, in order to better operation of the system and use in case of incident. The road connecting Ngoi La 1 reservoir and Ngoi La 2 reservoir is a segment on road going to shooting range of provincial military command. This segment is earth road, relatively steep, width of road surface of 3m. The starting point is on the dam in village no. 1, Trung Mon commune and the end point is in Dong Son village, Chan Son commune. The road will be temporarily used when the dam under construction. Material transport will also use this road to release pressure on the main road. The current earth road will be upgraded to concrete surface road with length of 1885m, lowering slope. The new road will contribute to ensure travel demand of people. Recognized vegetation along the road is mainly bushes, shrubs and some common timber trees such as acacia, bead tree. Acquired land area for construction of management road is estimated of 1ha. These land areas are garden land of households. Affected trees are fruit tree (grapefruit, star fruit, apple, etc.) and lower economic value vegetables, is not kind of rare

Screening questions	Yes	No	Description of impact
			plants.
Interrupt the cycle of migration of wildlife, wild animal or grazing animal, nomads or semi-nomads		✓	The subproject is carried out in the village no. 1, Trung Mon commune, Yen Son district, is habitat of people. No kind of wildlife is detected at all, there are only grazing animals such as buffalo, cows, etc. The construction of subproject will not disrupt the cycle of migration of wildlife, wild animal. There is no nomad or semi-nomad living in project area
9. The subproject does not have precedent work, does it?			
No precedent at national level?		✓	There have been many similar projects to be implemented.
No precedent at provincial level?		✓	There are a total of five reservoirs with a capacity of over 1 mil. m^3 in Tuyen Quang province has been upgraded, repaired, and similar to the scope of Ngoi La 2 reservoir.
10. Is subproject controversial and likely to attract the attention of NGOs and national or international social organizations?			
Considered as risk and likely to have special controversial aspects		✓	As a repairing project, the works has been used for long time with management unit and specific service object. Thus, it is not likely to occur particular controversial aspects.
May lead to protests of those who wish to express or prevent construction.		✓	Consultation results showed that both the government and the people fully agreed and supported implementation of subproject.

Appendix A5: DIAGRAM OF SAMPLING AND MONITORING ENVIRONMENT



Appendix A6 – ANALYSIS RESULT OF ENVIRONMENT SAMPLES

Institute for Water, Irrigation and Environment

General analysis Department

Address: 1/95 - Chua Boc - Dong Da - Ha Noi Tel: 844-8.539.127 Fax: 844-5.634.809

RESULT OF SURFACE WATER SMAMPLE ANALYSIS

Project : Environmental assessment of Ngoi La reservoir–Tuyen Quang

Location : Trung Mon commune –Yen Son district –Tuyen Quang province

Client : Duong Thi Kim Thu

Department : Finance and planning department

Date : 09/02/2015

Results of surface water analysis:

TT	Chỉ tiêu	Đơn vị	Mẫu NM1	Mẫu NM2	Mẫu NM3	NTR 08:2008 (A2)	NTR 08:2008(B1)
1	pH	-	6,8	7,2	6,9	6-8,5	5.5-9
2	Độ đục	NTU	45	57	63	-	-
3	TSS	mg/l	23	34	28	30	50
4	DO	mg/l	7,4	6,9	7,0	≥5	≥4
5	BOD_5	mg/l	9	6	8	6	15
6	COD	mg/l	15	12	18	15	30
7	Pb	mg/l	0.0042	0,0067	0,0054	0,02	0,05
8	Hg	mg/l	KPH	KPH	KPH	0,001	0,001
9	As	mg/l	0,0008	0,0005	KPH	0.02	0.05
10	Fe	mg/l	0,68	0,26	0,78	1	1,5
11	Coliform	MPN/100 ml	3400	490	2800	5000	7.500
12	E.coli	MPN/100 ml	34	45	18	50	100

Note: KPH – uncover

Representative of analysis group

Head of analysis department

Ha Noi, dated 24 February 2015

Institute for water, irrigation and Environment

Le Van Cu

Institute for Water, Irrigation and Environment

General analysis Department

Address: 1/95 - Chùa Bộc - Đống Đa - Hà Nội Tel: 844-8.539.127 Fax: 844-5.634.809

RESULT OF GROUND WATER SMAMPLE ANALYSIS

Project : Environmental assessment of Ngòi Là reservoir–Tuyên Quang

Location : Trung Môn commune –Yên Sơn district –Tuyên Quang province

Client : Dương Thị Kim Thư

Department : Finance and planning department

Date : 09/02/2015

Results of ground water analysis:

No	Norm	Unit	Sample NN1	Sample NN2	Sample NN3	NTR 09:2008
1	pH	-	7,2	7,1	6,9	5.5-8.5
2	Total hardness	mg/l	225	235	325	500
3	Total solid	mg/l	89	50	46	1500
4	DO	mg/l	6,5	6,7	7,1	-
5	COD	mg/l	10	14	18	4
6	Cd	mg/l	KPH	KPH	KPH	0,005
7	Pb	mg/l	0,001	0,003	0,002	0,01
8	Hg	mg/l	KPH	KPH	KPH	0,001
9	As	mg/l	0,0014	0,0031	KPH	0,05
10	Fe	mg/l	23	17	12	5
11	Ecoli	MPN/100ml	KPH	KPH	KPH	KPH
12	Coliform	MPN/100ml	0	0	0	3

Note: KPH – Uncover

Representative of analysis group

Head of analysis department

Hà Nội, dated 24 February 2015

Institute for water, irrigation and Environment

Lê Văn Cư

Institute for Water, Irrigation and Environment

General analysis Department

Address: 1/95 - Chùa Bộc - Đống Đa - Hà Nội Tel: 844-8.539.127 Fax: 844-5.634.809

RESULT OF SOIL SMAMPLE ANALYSIS

Project : Environmental assessment of Ngòi Là reservoir–Tuyên Quang

Location : Trung Môn commune –Yên Sơn district –Tuyên Quang province

Client : Dương Thị Kim Thư

Department : Finance and planning department

Date : 09/02/2015

Results of soil sample analysis:

No	Norm	Unit	Sample Đ1	Sample Đ2	Sample Đ3	NTR 03:2008 (Đất NN)
1	Cu	mg/kg dry soil	6	10	8	50
2	Pb	mg/kg dry soil	12	17	18	70
3	Zn	mg/kg dry soil	65	45	68	300
4	As	mg/kg dry soil	1.01	1.9	1.12	12
5	Cd	mg/kg dry soil	0.11	0.52	0.35	2

Representative of analysis group

Head of analysis department

Hà Nội, dated 24 February 2015

Institute for water, irrigation and Environment

Lê Văn Cư

Appendix A7 - MINUTES OF STAKEHOLDER MEETING

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

Trung Môn..., ngày 25...tháng 1.. năm 2015

BIÊN BẢN LÀM VIỆC

(V/v Điều tra khảo sát hiện trạng tài sản bị ảnh hưởng tại xã... Trung Môn.........)

Hôm nay, ngày. 25 tháng 1.. năm 2015, tại trụ sở UBND xã..... Trung Môn.............., huyện........ Yên Sơn..........,Tỉnh Tuyên Quang. Chúng tôi gồm:

A. ***Đại diện UBND xã*** ... Trung Môn........................

Ông (bà).... Nguyễn Việt Dũng.......... Chức vụ:... phó Chủ tịch xã......

Ông (bà).. Nguyễn Văn Ngọn.......... Chức vụ:.. CT HĐND xã.....

Ông (bà).. Vũ Văn Hạnh,................ Chức vụ:.. Ngành dân............

và

B. ***Đại diện*** ...Viện Nước Tưới và Hạ tầng........ (gọi tắt là Tư vấn):

Ông (bà)...... Phí Thị Hằng.................... Chức vụ:..... CN.......................

Ông (bà)..... Bạch Huy Hoàng.............. Chức vụ:.... CN phòng KH-TC

Ông (bà)....... Dương Thị Kim Thư.......... Chức vụ: Thư ký phòng KH-TC

Cùng tiến hành họp và thống nhất một số công việc như sau:

1. Tư vấn thông báo cho UBND xã về phạm vi bị ảnh hưởng và ranh giải toả dự kiến của Dự án . Nâng cấp đảm bảo an toàn hồ chứa Ngòi Lá 2 trên địa bàn xã.
2. UBND xã cung cấp cho tư vấn danh sách các hộ bị ảnh hưởng bởi Dự án.
3. UBND xã xác nhận tư vấn đã tiến hành khảo sát điều tra tài sản hiện trạng của .... hộ bị ảnh hưởng bởi dự án trên địa bàn xã (có danh sách kèm theo)

Ghi chú:

.... Đồng bào dự án Sửa chữa nâng cấp Hồ chứa nước Ngòi Lá 2 trên địa bàn xã ....

.... - Gia cố đập, Mở rộng tràn, nâng cấp đường quản lý.....

.... - Thay toàn cống lấy nước ... Sẽ gây ra 1 số tác động về giao thông trong giai đoạn ....

...... Cam kết thực hiện các biện pháp giảm thiểu ....

Xác nhận của UBND xã

T.M UỶ BAN NHÂN DÂN XÃ
PHÓ CHỦ TỊCH

Nguyễn Việt Dũng

Đại diện tư vấn

DƯƠNG THỊ KIM THƯ

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

--------***--------

Mường Mòn....., Ngày 23 tháng 1 năm 2015

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG

Về các vấn đề môi trường

Công trình: Nâng cấp, sửa chữa an toàn Hồ chứa Nước Là 2, Tỉnh Tuyên Quang

Xã Mường Mòn, huyện Yên Sơn, Tỉnh Tuyên Quang

Hôm nay, ngày 23 tháng 1 năm 2015, tại Xã Mường Mòn chúng tôi gồm::

I. Thành phần tham dự

- Ông/Bà. Nguyễn Việt Dũng Chức vụ P.Chủ tịch xã
- Ông/Bà. Lê Hải Hưng Chức vụ Cán bộ Văn hóa
- Ông/Bà. Nguyễn Văn Ngợi Chức vụ Chủ tịch MTTQ xã
- Ông/Bà. Phí Thị Hồng Chức vụ Chủ tịch Hội phụ nữ
- Ông/Bà. Bạch Huy Hoàng Chức vụ Chuyên gia Môi trường
- Đại diện những người bị ảnh hưởng: 20.. người (*chi tiết xem Danh sách tham dự cuộc họp*)

II. Nội dung tham vấn

1- Cán bộ giới thiệu về địa điểm, quy mô, các thông số kỹ thuật cơ bản và những tác động Dự án được xây dựng tại địa phương mang lại.

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

III. Ý kiến thảo luận

1. Các tác động:

Dự án Sửa chữa này cấp sẽ có Hoạt động đến môi trường xung quanh tăng cao giai đoạn

giai đoạn giải phóng mặt bằng, giai đoạn thi công và giai đoạn vận hành của dự án

2. Những đối tượng bị ảnh hưởng

- Con người: là những người dân, công nhân xây dựng
- Cảnh quan môi trường tự nhiên
- Kinh tế xã hội
- Dân tộc thiểu số

3. Đề xuất biện pháp giảm thiểu:

- Hạn chế chuyên chở vật liệu trong giờ cao điểm, giải phóng đúng mốc chỉ giới
- Thi công nhanh đều [illegible] đúng kỹ [illegible] theo tiến độ
- Sử dụng máy móc ít gây tiếng ồn, phun nước chống bụi ...

IV. Kết luận

Mặc dù khi xây dựng dự án sẽ có 1 số tác động xảy ra xong đây là dự án nâng cấp sửa chữa sẽ [illegible] có cải thiện

Bà con trong xã mong muốn dự án được nâng cấp sửa chữa để cho đập an toàn hơn, bà con đi lại thuận tiện hơn và nhất là tiêu thoát nước trong hệ thống đồng ruộng thuận lợi

Cuộc họp các bên thống nhất và kết thúc vào lúc: 10h giờ.........ngày.........tháng........năm 2015

Đại diện Chủ đầu tư	Đại diện cộng đồng	Đại diện UBND xã
Lê Văn Hùng	Vũ Văn Hạnh	Nguyễn Việt Dũng

Đại diện Mặt trận Tổ quốc xã	Cán bộ tham vấn	Đại diện đơn vị tư vấn
Nguyễn Văn Ngọn	Phí Thị Hằng	Dương Thị Kim Thư

- CÁC BIÊN BẢN THỎA THUẬN

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

--------***--------

Trung Môn..., Ngày 25 tháng 2 năm 2015

BIÊN BẢN XÁC NHẬN VỊ TRÍ LÁN TRẠI

Công trình: Nâng cấp đảm bảo an toàn hồ chứa nước Ngòi Là 2.

Xã Trung Môn - Yên Sơn - Tuyên Quang

Hôm nay, ngày 25 tháng 2 năm 2015, tại Xã Trung Môn

chúng tôi gồm:

I. ***Đại diện đơn vị lập báo cáo ĐTM:*** Viện Nước TL và MT

- Ông/Bà Dương Thị Kim Thu Chức vụ Trưởng phòng KH-TC
- Ông/Bà Bạch Huy Hoàng Chức vụ Cb

II. ***Đại diện địa phương:*** UBND xã Trung Môn và Ban QL DA

- Ông/Bà Lê Hải Hưng Chức vụ Gđốc ban
- Ông/Bà Nguyễn Việt Dũng Chức vụ P. Chủ tịch xã

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

Vị trí: Bãi đất trống ven hồ - xóm 1 xã Trung Môn

Tình trạng sở hữu:

Ban Quản lý hồ Ngòi Là 2 quản lý

Diện tích: 1500 m²

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

Phía dưới giáp với bãi đất bỏ trống ven hồ - không có cây cối

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

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

Xác nhận của địa phương	**Đơn vị lập báo cáo ĐTM**
TM ỦY BAN NHÂN DÂN XÃ PHÓ CHỦ TỊCH (UBND xã Trung Môn, H. Yên Sơn, Tuyên Quang – đã ký, đóng dấu) Nguyễn Việt Dũng	(đã ký) Dương Thị Kim Thu
ĐẠI DIỆN CHỦ ĐẦU TƯ (Ban Quản lý Khai thác Công trình Thủy lợi Tuyên Quang – đã ký, đóng dấu) Lê Hải Hưng	

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

--------***--------

...Trung Môn......, Ngày 24 tháng 2 năm 2015

BIÊN BẢN XÁC NHẬN VỊ TRÍ ĐỔ THẢI

Công trình: Nâng cấp đảm bảo an toàn hồ chứa Ngòi Là 2

Xã Trung Môn – huyện Yên Sơn – Tuyên Quang

Hôm nay, ngày 24 tháng 2 năm 2015, tại Xã Trung Môn – Yên Sơn

chúng tôi gồm:

I. Đại diện đơn vị lập báo cáo ĐTM: Viện Nước TT và Môi trường

- Ông/Bà Dương Thị Kim Thư ... Chức vụ Trưởng phòng KH – TC
- Ông/Bà Bạch Huy Hoàng ... Chức vụ Cbộ

II. Đại diện địa phương: xã Trung Môn và ban QL DA

- Ông/Bà Nguyễn Việt Dũng ... Chức vụ P. Chủ tịch xã
- Ông/Bà Lê Hải Hưng ... Chức vụ [illegible] Ban

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

Vị trí: Thuộc địa phận xã Trung Môn khu đồi

Tình trạng sở hữu:

Thuộc UBND xã Trung Môn quản lý

Trữ lượng: 30.000 → 50.000 m³

Cự li vận chuyển: 2 → 2,5 km

Mô tả môi trường xung quanh bãi đổ thải:

Khu đồi trống 1 phía giáp đường đi Nà Tràng

3 phía giáp đồi trồng cây keo.

xung quanh cây cỏ dại

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**	**Đơn vị lập báo cáo ĐTM**
T.M ỦY BAN NHÂN DÂN XÃ PHÓ CHỦ TỊCH Nguyễn Việt Dũng	ĐẠI DIỆN CHỦ ĐẦU TƯ BAN QUẢN LÝ KHAI THÁC CÔNG TRÌNH THUỶ LỢI TUYÊN QUANG Lê Hải Hưng	DƯƠNG THỊ KIM THƯ

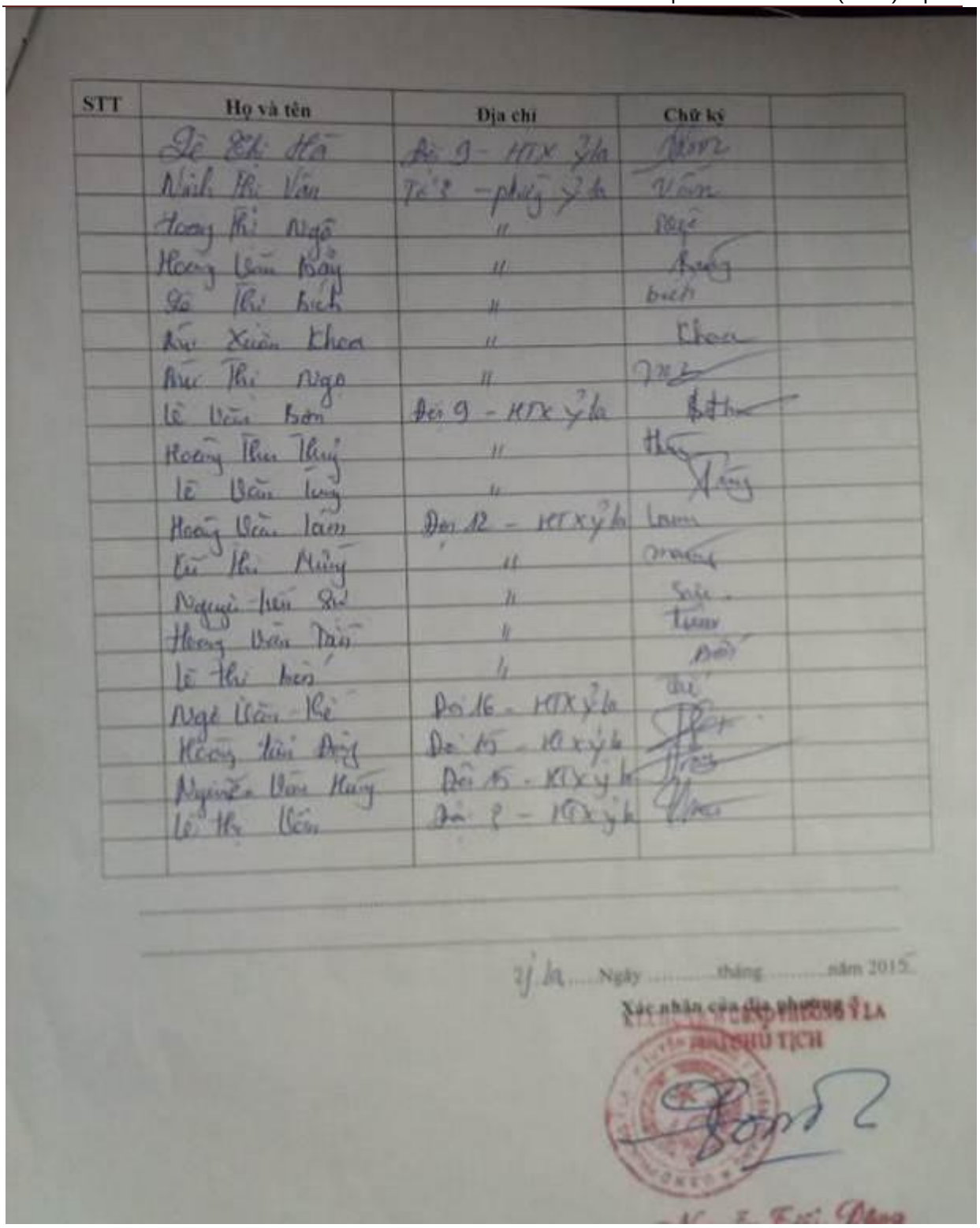
Độc lập - Tự Do - Hạnh phúc

DANH SÁCH NHỮNG ĐẠI BIỂU THAM DỰ CUỘC HỌP

THAM VẤN CỘNG ĐỒNG .....

.....

STT	Họ và tên	Địa chỉ	Chữ ký
1	Vũ Văn Cường	tổ 13 phường Tân Hà - Ý La	
	Trần Thu Hường	Đội 4 - HTX Ý La	
	Nguyễn Thị Sy	Đội 3 - HTX Ý La	
	Hoàng Thị Thanh	Đội 10 HTX Ý La	
	Vũ Thị Thái	Đội 8 - HTX Ý La	
	Trần Thị Kiêm	Đội 7 - HTX Ý La	Kiêm
	Nguyễn Thị Hình	"	
	Hoàng Kim Quyến	Đội 3 - HTX Ý La	Quyến
	Đỗ Thị Hiền	"	Hiền
	Dương Thị Trung	Đội 16 - HTX Ý La	
	Đặng Thị Hoa	Đội 8 - HTX Ý La	Hoa
	Trần Thị Thu	Đội 7 - HTX Ý La	Thu
	Hoàng Văn Hưng	Đội 12 - HTX Ý La	
	Hoàng Thị Hoa	Đội 11 - HTX Ý La	
	Nguyễn Thị Sơn	Đội 7 - HTX Ý La	
	Hoàng Văn Hợi	Đội 12 - HTX Ý La	
	Trần Duy Hoá	Đội 16 - HTX Ý La	
	Nguyễn Kim Ngọc	Đội 13 - HTX Ý La	
	Vũ Văn Thuỷ	Đội 11 - HTX Ý La	
	Nguyễn Quyết Chiến	Đội 12 - HTX Ý La	
	Trần Văn Thanh	Đội 3 - HTX Ý La	
	Kim Văn Quang	Đội 5 - HTX Ý La	Quang
	Đỗ Xuân Phương	Đội 1 - HTX Ý La	
	Nguyễn Quốc Hồng	Đội 14 - HTX Ý La	
	Vũ Minh Hoàn	Đội 3 - HTX Ý La	
	Nguyễn Hữu Xuân	Đội 5 - HTX Ý La	Xuân



STT	Họ và tên	Địa chỉ	Chữ ký	
	Lê Thị Hà	Đội 9 - HTX Ý La	Hà	
	Mai Thị Vân	Tổ 3 - phường Ý La	Vân	
	Hoàng Thị Ngô	"	Ngô	
	Hoàng Văn Bảy	"	Bảy	
	Lê Thị Bích	"	Bích	
	Lưu Xuân Khoa	"	Khoa	
	Bùi Thị Ngọ	"	Ngọ	
	Lê Văn Bàn	Đội 9 - HTX Ý La	Bàn	
	Hoàng Thu Thủy	"	Thủy	
	Lê Văn Lưu	"	Lưu	
	Hoàng Văn Lâm	Đội 12 - HTX Ý La	Lâm	
	Lê Thị Mừng	"	Mừng	
	Nguyễn Văn Sử	"	Sử	
	Hoàng Văn Tài	"	Tài	
	Lê Thị Hòa	"	Hòa	
	Ngô Văn Hè	Đội 16 - HTX Ý La	Hè	
	Hoàng Văn Đông	Đội 15 - HTX Ý La	Đông	
	Nguyễn Văn Hưng	Đội 15 - HTX Ý La	Hưng	
	Lê Thị Vân	Đội 2 - HTX Ý La	Vân	

Ý La, Ngày ..... tháng ..... năm 2015

Xác nhận của địa phương

Ý LA

CHỦ TỊCH

Appendix A8- PICTURES OF CURRENT STATUS OF SUBPROJECT AREA

Pictures of project works

CURRENT STATUS OF SPILLWAY AND CANNAL

CURRENT STATUS OF DAM

CURRENT STATUS OF WATER CURRENT STATUS OF DAM SURFACE

INLET SLUICE

PENETRATION POINT AT DAM BODY

PENETRATION POINT AT DAM FOOT

CURRENT STATUS OF CONNECTION ROAD 2 RESERVOIRS

WASTE STORAGE DUMP

MATERIAL STORAGE GROUND

Pictures of affected region by subproject

The affected garden land area when expanding spillway

Households with affected cattle coop area

Affected households

The affected garden land

The trees will be cut to improve downstream

The road will be affected during

roof construction time

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 B4 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 (25 HHs), 4) key informant interview (4 people), and 5) households survey (311 HHs).

A total of 357 of respondents participated in the SA exercise for this subproject, of which 311 people participated in the households' survey (quantitative), and 46 people participate in focus groups discussions, community meetings, and 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 B4 of this ESIA, and the public health intervention plan and public consultation and communication plan were presented at Appendix B2 and B3, respectively).

Appendix B2: PUBLIC HEALTH INTERVENTION PLAN

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

The activities of the subproject will generate impacts on the surroundings quality: air, water and soil environment, in addition it may arise disease. All these factors will affect directly 30 workers, the entire population around the project area and households along the transport route. The consequence of these effects lead to increase occupational accidents, traffic accidents, diseases related to respiratory and intestinal system and eyes.

Households living along the transport route and 30 workers working on work site will directly contact with sources of pollution and disease from the activities of the project, although subproject have had measures to limit pollution such as dust, emissions, wastewater and epidemics, but there are potential impacts that we do not see immediately, so need to take measures for early detection of disease and sources of disease. The plan indicates the measures to minimize and prevent those impacts.

2. Objective

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

3. Measure and content of public health management

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

4. Role and responsibility of agencies, organizations and individuals

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

- DARD and PMU are responsible for building materials about public health safety training.
- Coordinate all levels of authorities in village no. 1, Trung Mon commune (local authorities, Fatherland Front, Women's Union, Farmers' Union, Youth Union, hamlet representative) organize propaganda activities about health safety.

Department of Health, Yen Son district Preventive Medicine Center

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

People's Committee, Social Organizations

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

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

5. Implementation Schedule

Public Health Management Plan implemented at 3 stages of the subproject and extended 6 months at operation stage.

Table B2-1 Implementation Schedule of "Public Health Management Plan"

No	Measure	Content	Responsible unit	Cost	Time
1	To train and raise awareness, prevent impacts on health	- Identify the impact of air and water environment, food safety. - Preventable measures (using a comforter when entering the affected area, treat water pollution by alum and chloramine B)	- Department of Agriculture and Rural Development (DARD) - Project Management Unit (PMU) - Tuyen Quang Preventive Medicine Center	15.000.000 millions	2 stages in the early and the mid-stage of the project

No	Measure	Content	Responsible unit	Cost	Time
		- Cleaning household sector, ranch house	- Health Station at commune/ ward - Contractor		
2	- Organize regularly medical examination for workers and people in the subproject region	- Check the health of workers 3 months/ time, residents in the affected areas 6 months / time - The diseases related to respiratory system, intestinal tract, eyes - To consult the affected people during examination - Advise or handle when the detection of abnormalities related to the impact of subproject (timely notify to the authorities and functional units)	- Department of Agriculture and Rural Development (DARD) - Project Management Unit (PMU) - Tuyen Quang Preventive Medicine Center - Health Station at commune/ ward - Contractor	Budget of Yen Son district	3 months/ time from the start of construction
3	- Build plan to minimize the impact on public health	- Medical staffs at commune/ ward monitor regularly the implementation of the mitigation measures of	- Department of Agriculture and Rural Development - Project Management Unit (PMU)	Budget of Yen Son district	Continuously during the construction time

No	Measure	Content	Responsible unit	Cost	Time
		construction units. - To treat timely occupational accidents and traffic - To vaccinate completely children, pregnant woman	- Tuyen Quang Preventive Medicine Center - Health Station at commune/ ward - Contractor - Women's Union - Fatherland Front		
4	Build plan to prevent and treat epidemic	- To spray fly and mosquito-spray in the project area with the frequency of 3 months/ time. - To guide the water sanitation; use chloramine B for pretreatment of wastewater on work site and households. - When appearing epidemic, we need localize epidemic, isolate infectious objects and spray chloramine B to disinfect.	- Department of Agriculture and Rural Development (DARD) - Project Management Unit (PMU) - Tuyen Quang Preventive Medicine Center - Health Station at commune/ ward - Contractor - Women's Union - Fatherland Front	Budget of Tuyen Quang province (Department of Health) and contractor	Continuously during the construction time (18 months)

Appendix B3: PUBLIC CONSULTATION, PARTICIPATION AND COMMUNICATION STRATEGY

1. The necessity of the construction of communication plan

The subproject "Repair and improvement for safety of Ngoi La 2 reservoir, Tuyen Quang province" cause impacts: (i) positive impacts: ensure safely for households in the downstream area, ensure stability source of irrigation water supply for 1,054 ha of rice and crop plants in current irrigated areas of communes named Trung Mon, Kim Phu of Yen Son district and wards named Y La, Tan Ha, Hung Thanh of Tuyen Quang city; (ii) negative impacts: acquire land and assets on land of 11 households, affect economy and public health, impact on gender equality…

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

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

2. Objective

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

3. Contents

- Information on the subproject and policies of interest will be disseminated to people by Project Management Unit (PMU);
- Environmental and Social Management Plan: (i) the PMU and consultancy units provide information of impacts and mitigation measures; (ii) To consult the local authorities and social organizations, unions, people around the project area.
- Resettlement Action Plan: Provides information about land acquisition, resettlement, compensation cost apply framework and support policies of the

subproject and the provisions of Tuyen Quang Province and government at various levels, affected people

- Gender Action Plan: provides information about gender equality for the local authorities and social organizations, unions, people around the project area.
- Public Health Management Plan: provides information on the solutions, disease prevention plan, medical examination periodically.
- Social security, traffic safety, social evils: provide information about law, legal education for workers, people around the subproject area.
- Dam Safety: disseminate plans when occurring dam safety incidents in the construction process and the rainy season.
- Operate mining and flood discharge: provide information and detailed plans for the flood discharge to people around the project area and downstream area; make protection plan for the people, the buildings in downstream of the dam.

4. Forms of communication, community consultation

In order to organize the effective communication activities, need understand the basic elements of the communication process and public relations of them.

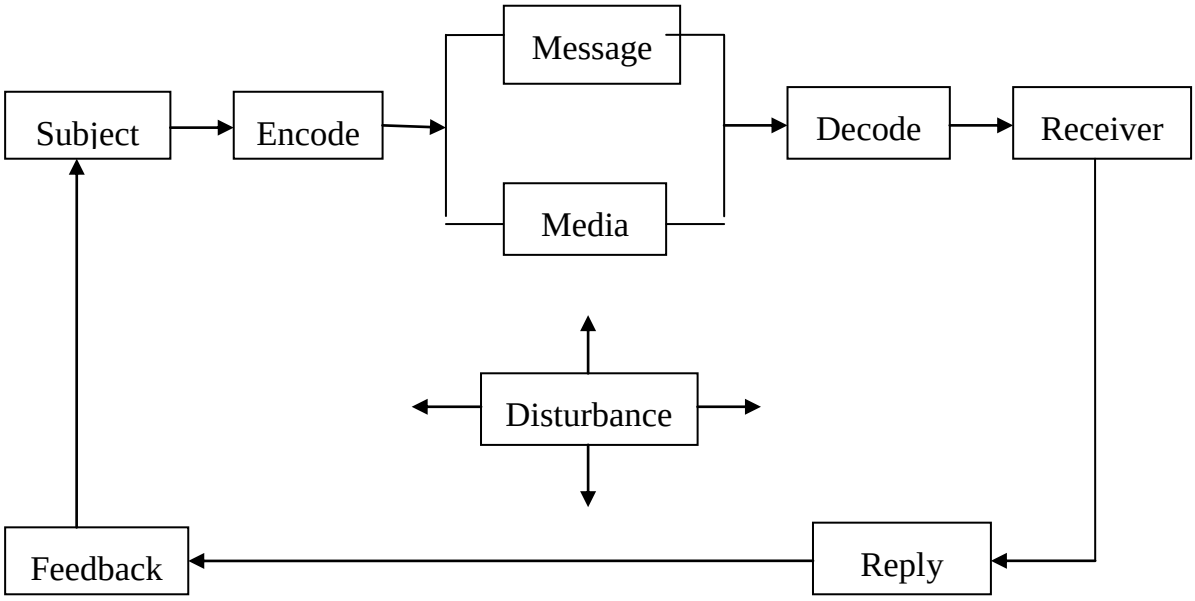


Diagram B3-1: The elements of the communication process

- Organize meetings to disseminate information for local authorities, social organizations, unions, people of the subproject region (Trung Mon commune, Yen Son precinct);
- Through the mass media, basis loudspeakers, commune and village boards;

- Issue brochures, consultative questionnaires to local authorities, unions, people of the subproject area;
- Through the activities of organizations and clubs;
- Training;
- Other media and information forms.

5. Role and responsibility of agencies, organizations and individuals

Department of Agriculture and Rural Development represents Tuyen Quang province people's committee is an investor.

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

- DARD and PMU are responsible for building materials about communication plan and participatory public consultation.
- Coordinate government at various levels in Trung Mon commune, Yen Son district (local authorities, Fatherland Front, Women's Union, Farmers' Union, Youth Union, hamlet representative) organize propaganda activities for this plan.

People's Committee, Social Organizations

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

Land Clearance Committee

- Provide information about land acquisition, resettlement, compensation cost apply framework and support policies of the subproject and the provisions of Tuyen Quang Province and government at various levels, the affected people.

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

6. Implementation Schedule

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

Table B3-1 Implementation Schedule of "Communication Plan, Consultation with Community Participation"

No	Stage	Content	Form	Responsible unit	Receptive unit	Note
1	**Preparation**	Disseminate information, consult the authorities about subproject: scale, type of investment, the main works, incidence, benefits of the subproject.	Organize meeting at government at various levels, mass organizations.	DARD and PMU	Tuyen Quang PPC, Department of Planning and Investment, Department of Finance, Department of Natural Resources and Environment, Yen Son DPC, Government of Trung Mon commune, Yen Son district.	
		Disseminate information about policies, compensation plan, the draft of resettlement action plan.	Meetings, leaflets, consultation votes at all government levels, the affected households around the subproject area.	PMU coordinate with design consultancy unit, resettlement action plan consultancy unit.	Yen Son DPC, Trung Mon commune, Women's Union, Fatherland Front, Farmers' Union, Cadastral	Perform 2 times: to prepare and present a draft of resettl

No	Stage	Content	Form	Responsible unit	Receptive unit	Note
					Division of commune/ precinct, 11 households in the project area.	ement action plan
		Disseminate information about project, present the draft of ESIA and ESMP reports, gender plan, public health, communication, etc.	Meetings, leaflets, consultation votes at all government levels, the affected households around the subproject area	PMU coordinate with design consultancy unit, ESIA consultancy unit	Yen Son DPC, Trung Mon commune, Women's Union, Fatherland Front, Farmers' Union, Cadastral Division of commune/ precinct, 60 households in the project area.	Perform 2 times: to prepare and present a draft of resettlement action plan.
		Compensation and resettlement	Organize meetings to disseminate information about measure, counting, compensation plan, post information in notice board of commune and village	PMU coordinate with Compensation, Assistance and Resettlement Board	Trung Mon CPC Women's Union, Fatherland Front, Farmers' Union, Cadastral Division of commune/ precinct and 11 affected households.	Implement according to Resettlement Action Plan report.
No	**Stage**	**Content**	**Form**	**Responsible unit**	**Receptive unit**	**Note**

No	Stage	Content	Form	Responsible unit	Receptive unit	Note
2	**Construction and Operation**	Gender Action Plan	Meetings, leaflets, basic broadcasting, consultation votes at government at various levels, the affected households around the subproject area	PMU and Social Supervising Consultant	Trung Mon CPC Women's Union, Fatherland Front, Farmers' Union, Cadastral Division of commune and 11 affected households.	Implement in 3 phases of the subproject.
		Public Health Management Plan				
		Social Management Plan				
		Environmental Management Plan		PMU and Environmental Supervising Consultant	DONRE, Trung Mon CPC Women's Union, Fatherland Front, Farmers' Union, Health Station, Cadastral Division of commune/ precinct and 11 affected households.	Implement in 3 phases of the subproject
		Public order and social evils		PMU and contractor	Trung Mon CPC Women's	
		Traffic Safety				Const

No	Stage	Content	Form	Responsible unit	Receptive unit	Note
		and Fire Prevention and Extinction			Union, Fatherland Front, Farmers' Union, Health Station, Cadastral Division and Police of commune/ precinct .	ruction Stage.

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

Implementation Cost

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

Appendix B4- GENDER ACTION PLAN

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

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

The Project's Gender Action Plan

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;	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	During construction stage

Achievements	Tasks and Indicators	People in charge	Period
	The Contractors shall not employ children; Those locals wish to work for the project shall register at their villages/hamlets. Then, these registrations shall be provided by the Head of the villages and communes to the Contractors for selection in favour of poor and vulnerable households.	shall ensure the achievement of the targeted objectives. The communal women group shall ensure the 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	Programs on HIV/AIDS and human trafficking. Programs on community-based risk mitigation. Information about risk mitigation will be transferred to the communes and villages affected by the Project using the participatory approach with a focus on the poor and vulnerable households (e.g. ethnic groups, households headed by women, households with elderly and disabled people). The documents and information should be appropriate in terms of language, culture and gender, and especially translated into ethnic languages in the region; Women's Union, the representative of Centre for HIV/AIDS prevention and communal staff shall give training to communicators in each commune/village in the project area.	The Provincial and Communal Women's Union shall organize and host the program (training and preparation of materials) in collaboration with the district/communal health center. The Village's Women's Union shall popularize and communicate information. The district/communal Health Centers shall support the communal Women's Union. Project coordinator shall provide local and international gender experts and	Monthly, before and during construction stage

Achievements	Tasks and Indicators	People in charge	Period
	The programs will be implemented at the communes and villages by two communicators (village chief and one member of the Women's Union). The program will be implemented in the villages and on market-days through distribution of project/program materials and use of loudspeakers	specialists on Ethnic Minorities. Gender experts and specialists on EM shall review existing materials and supplement the required ones for the Program.	
	Program on risk mitigation during project construction stage: PMU and the contractor will coordinate closely with the health services in communes and districts to implement programs on awareness enhancement and education on disease prevention, diagnosis and treatment for laborers. All programs and documents are built with integration of gender issues, including vulnerability and needs of men and women. The Contractor shall: Implement awareness enhancement programs workers and communities, including education and communication on HIV infection and preventive measures. Provide free consulting services and encourage employees to do HIV tests so that they all know about their health status. Support the access to health services and encourage HIV-infected patients to admit their status; Provide medical equipment (free condoms) for workers in the camps;	PMU The Contractor Local Health Centre Communal staff The Women's Union shall perform general coordination for better HIV prevention.	During construction stage.
Project Management	Guidelines on Gender and Development and Education shall	- Project implementation	During design and initial

Achievements	Tasks and Indicators	People in charge	Period
	be provided for PMU staff, local agencies and Contractors. All capacity enhancement activities shall include the involvement of women and ethnic minorities.	consultant - PPMU	implementation stages

Appendix B5- GRIEVANCE REDRESS MECHANISM

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

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

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

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

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

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

(i) The person competent to settle first-time complaints should:

a) Ask the complainant, relevant agencies, organizations and individuals to provide information, documents and evidence within 07 days of the request as a basis for grievance redress;
b) Determine to employ or cancel the emergency measures as defined in Article 35 of this Law;

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

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

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

In terms of announcement of 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.

(i) 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.

(ii) 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.

(iii) 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.

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

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

(i) **The first stage in the Communal People's Committee**: Households affected can file their complaints to any member of the CPC, possibly through the village chief or directly to the CPC in writing. The mission of the CPC officials or village chief is informing the entire CPC the complaint. Then, the CPC will hold a private meeting with the households affected and sign the complaint decision within 10 days. The CPC secretary shall be responsible for compiling and filing documentation of all complaints handled by the CPC. The duration of first-time settlement of complaints shall not exceed 30 days from the date of signing the complaint decision; for complicated cases, this period could be extended but not exceed 45 days from the date of receipt of the complaint. In remote regions difficult for travelling, the time limit for 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.

(ii) **The second stage in the District People's Committee**: According to Article 63 of the Decree No.84/2007/ND-CP of the Government, the procedure for 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.

(iii) **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- INFORMATION DISCLOSURE, ACCOUNTABILITY AND MONITORING

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	Taking the responsibility on implementing (EMP) in pre-construction and construction periods; Guarantee the detail of contract and bidding documents including	Taking the responsibility on implementing (EMP) in the first operation year; Conducting the investigation and supervision

Organization	Role and responsibility		
	Subproject's preparation	**Subproject's construction**	**Subproject's operation**
	environmental issues;	environmental requirements; Conducting the investigation and supervision environmental issues during construction time; Coordinating Environmental Monitoring Report to CPO;	environmental issues in the first operation year; Assist project owner in giving out environmental requirements in operation procedure and maintenance project;
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.

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

Organization	Role and responsibility		
	Subproject's preparation	**Subproject's construction**	**Subproject's operation**
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

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	Ngoi La 2 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	- The road near residential	Survey	Weekly or when having the	The local road	Involved in execution

Mitigation measures	Parameters	Location	Method	Frequency	Responsibility	Expenses
	reason The slow traffic time that affected by construction	area		feedback of local people	management agency	contract Local budget
1.5. Solid waste management	Clean level of tents The volume of rubbish	Worker's tent	Observe	Monthly or when having the feedback of local people	Contractor	Involved in construction contract
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	Construction site Worker's tent Dumping yard	Survey or interview	Monthly or when having the feedback of local people	Contractor	Involved in construction contract

Mitigation measures	Parameters	Location	Method	Frequency	Responsibility	Expenses
	has been moved to dumping yard The amount of material and other waste from construction site Rubbish from worker's tents					
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
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
	Independent monitoring report on Environmental and Social Safety states the following contents: (i) Supervision result of construction scene; (ii) Community based	6 months/time or 3 months/time	Independent Environmental Consultant	Subproject Management Board and WB

Project's Phase	Type of report	Frequency	Responsibility	Agency receives report
	Supervision result; (iii) Synthesis supervision results of execution supervision consultant; (iv) Result of environment monitoring and (v) Assessment results implementing ESMP and recommendation.			
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 Yen Son district	CPO and WB