

# Initial Environmental Examination

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January 2017

## **VIE: Productive Rural Infrastructure Sector Project in the Central Highlands**

Subproject: “Repairing, Upgrading Quang Loc Irrigation Works Systems in Dao Nghia Commune and Village No.2, Dak Sin Commune, Dak Rlap District, Dak Nong Province”

## CURRENCY EQUIVALENTS

(the exchange rate of the State Bank of Vietnam on August 1<sup>st</sup>, 2015)

Currency unit	–	Vietnamese Dong (VND)
VND 1.00	=	\$0.0000472
\$1.00	=	VND 21,175

## ABBREVIATIONS

ADB	Asian Development Bank
AP	Affected persons
CEP	Commitment on Environmental Protection
CPC	Communal People's committee
CPMU	Central Project Management Unit
DARD	Department of Agriculture and Rural Development
DONRE	Department of Natural Resources and Environment
DPC	District People's Committee
EIAR	Environmental Impact Assessment Report
EMDF	Ethnic Minority Development Framework
EMP	Environmental Management Plan
DARD	Department of Agriculture and Rural Development
HH	Household
IMA	Independent Monitoring Agency
IEE	Initial Environmental Examination
IPM	Integrated Pest Management
LIC	Loan Implementation Consultant
MONRE	Ministry of Natural Resources and Environment
PC	People's Committee
PPC	Provincial Peoples Committee
PPMU	Provincial Project Management Unit
RF	Resettlement Framework
SIR	Subproject Investment Report
TPC	Town People's Committee
UXO	Unexploded Ordnance

## **WEIGHTS AND MEASURES**

km	–	kilometer
kg	–	kilogram
ha	–	hectare
m	–	meter

## **NOTE**

In this report, "\$" refers to US dollars.

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## I. INTRODUCTION

The Productive Rural Infrastructure Development Project in the Central Highlands (The Project) is funded by loan from ADB, and Ministry of Agriculture and Rural Development (MARD) is the project owner. This project will be implemented within 05 years (2014 – 2019) and taken place in the 05 provinces (Lam Dong, Dak Nong, Dak Lak, Gia Lai and Kon Tum) of the Central Highlands.

The long-term purpose of Project is contributing to hungry alleviation and poverty reduction programs of the Government through sustainable development of the society, ecology and environment at community levels by developing infrastructures for production, improving socio-economic conditions and living standards of people in the area.

The short-term objectives of the project are (i) to rehabilitate and upgrade deteriorated or damaged irrigation systems and rural infrastructures, which are serving for production in 05 provinces of Highlands. (ii) To strengthen management capacity and implementation of ODA projects; strengthen infrastructure management at community, province, district and commune levels to gradually improve living standards and conditions of the poor in the project area in the Central Highlands. (iii) To build models, institutional policies on "water saving irrigation technology for strategic and economic valuable plants" and "management and exploitation of irrigation schemes sustainably with the participation of all economic sectors".

On sub-project **"Repairing, upgrading Quang Loc irrigation works systems in Dao Nghia commune and in Village No.2, Dak Sin commune, Dak Rlap district, Dak Nong province"**, will be implemented in Dao Nghia and Dak Sin communes, Dak Rlap district, Dak Nong province. The objectives of this sub-project are (i) enhancing irrigation capacity for Dao Nghia and Dak Sin communes; (ii) ensuring functions of irrigation system with changes of climate condition; (iii) connecting residential areas with production areas & transferring goods & productive machines; (iv) reducing production cost and increasing income for local people.

The objectives and scope of this IEE are to (i) assess the existing environmental conditions along and in the vicinity of the subproject; (ii) identify potential environmental impacts from the proposed components; (iii) evaluate and determine the significance of the impacts; (iv) develop an environmental management plan (EMP) detailing mitigation measures, monitoring activities, reporting requirements, institutional responsibilities and cost estimates to address adverse environmental impacts; and (v) carry-out public consultations to documentary issues/concerns that stakeholders may have on the sub-project and to ensure that such concerns are addressed in the sub-project design and mitigation measures.

This Initial Environmental Examination (IEE) of the sub-project is prepared to meet the requirements of environmental safety of ADB and the environmental regulations of Government of Vietnam. Its structure includes 11 parts as following:

(i) Introduction	(vii) Implementation arrangement, monitoring and reporting
(ii) Policy framework, legislation and management	(viii) Public consultation and information disclosure
(iii) Sub-project description	(ix) Grievance Redress Mechanism
(iv) Description of existing environment	(x) Conclusion commitment and Recommendation
(v) Environmental impacts screening	(xi) Annexes
(vi) Environmental Management Plan	

## **II. POLICY FRAMEWORK, LEGISLATION AND MANAGEMENT**

### **2.1 ADB policy**

The ADB's Safeguard Policy Statement (SPS) 2009 governs the environmental and social safeguards of ADB's operations. The SPS 2009 emphasizes on environmental and social sustainability in progress of economic growth and poverty reduction in Asia and the Pacific. The SPS environment safeguards aims to:

- i. Avoid adverse impacts of projects on the environment and affected people, where possible;
- ii. Minimize/mitigate and/or compensate adverse impacts on environment and affected people when avoidance is not possible; and
- iii. Help borrower/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

SPS requires preparing environmental safeguard document in the process of preparing a project including environmental management plan (EMP). The borrower/client needs to monitor EMP implementation. The monitoring will identify outstanding issues of EMP implementation and propose appropriate mitigation measures. Periodic monitoring reports on EMP activities will be submitted to ADB every semi-annual during construction of the project.

Moreover, all subprojects under the loan 3032-VIE need to follow the specific guidance on environmental assessment as stated in the Environmental Assessment Review Framework (EARF) of the project, prepared by the project owner and approved by ADB. The subprojects under loan 3032-VIE only categorized as Category B or C will be included in the list of eligible sub-projects for possible funding under the proposed Project. It is anticipated that all eligible sub-projects will fall into Category B, whereby some adverse environmental impacts are expected, but of a lesser.

The subproject "Repairing, upgrading Quang Loc irrigation works system in Dao Nghia Commune and Village No.2, Dak Sin commune, Dak R'lap district, Dak Nong province" is selected based on the project's EARF that may cause the insignificant impacts to the environment and ranked as categorized B. This ranking is because of (i) It is not close to any preserved areas. (ii) There is no any household whose house will be affected due to land acquisition to the sub-project implementation. (iii) It estimates there are about 211 households whose production land will be acquired to implement the subproject but not any households will lose more than 10% their land. (iv) Some impacts are environmental adverse impacts but these impacts will take place within sub-project sites and can be controlled by mitigation measures. Therefore, an IEE needs to be prepared with an EMP enclosed.

### **2.2 Environment regulations of Vietnam government**

The project must also comply with the environmental regulations. The Vietnam legal framework comprises of the following issues:

- The Law on Environmental Protection adopted by the National Assembly of the Socialist Republic of Vietnam dated January 01, 2015. The law regulates general environmental protection requirements, policies and resources for protecting the environment;
- The Law on Labor adopted by the National Assembly of the Socialist Republic of Vietnam dated June 18, 2012 that regulates general requirement on safety and occupational health;
- Decree No. 18/2015/NĐ-CP on April 01, 2015 of the Government that regulates on environmental protection planning, strategic environmental assessment, environmental impact assessment (EIA) and environmental protection Plan (EPP);
- Decree No. 38/2015/ND-CP on June 15, 2015 of the Government that stipulates on waste and disposal management;
- Decree No. 201/2013/ND-CP on November 27, 2013 of the Government that details the Law on water resources;
- Circular No. 27/2015/TT-BTNMT on May 29, 2015 of the Ministry of Natural Resources and Environment (MONRE) that guides details on strategic environmental assessment, environmental impact assessment and environmental management plans;

- Circular 36/2015/TT-BTNMT on June 30, 2015 of the Ministry of Natural Resources and Environment (MONRE) that stipulates on Hazardous waste management;
- Circular 27/2013/TT-BLDTBXH on November 18, 2013 of the Ministry of Labor, War invalids and Social Affairs that guides training on labor safety and hygiene;
- Decision 3733/2002 /QĐ-BYT on October 10, 2002 of the Ministry of Health that promulgates 21 labor hygiene standards, 5 principles and 7 labor hygiene measurements;
- TCVN 4118:2012: National technical standard for irrigation works/systems and design requirements;
- TCVN 6707:2009: National technical standard Hazardous waste – Warning signs;
- QCVN 05:2013/BTNMT: National technical regulation on ambient air quality;
- QCVN 26:2010/BTNMT: National technical regulation on noise;
- QCVN 27:2010/BTNMT: National technical regulation on vibration;
- QCVN 01:2009/BYT: National technical regulations on drinking water;
- QCVN 07:2009/BTNMT: National technical regulation on hazardous waste thresholds;
- QCVN 08-MT:2015/BTNMT: National technical regulation on surface water quality;
- QCVN 09-MT:2015/BTNMT: National technical regulation on ground water quality;
- QCVN 14:2008/BTNMT: National technical regulation on domestic wastewater;
- QCVN 04 – 05:2012/ BNNPTNT: National technical regulations on irrigation works – main regulations on design.



**III. SUBPROJECT DESCRIPTION**

The general information of Sub-project has been described in the following table:

**Table 1: General information of the subproject**

DESCRIPTION	SUB-PROJECT DATA
<b>III.1. GENERAL INFORMATION</b>	
Sub-Project Name	Repairing, upgrading Quang Loc irrigation works systems in Dao Nghia commune and in Village No.2, Dak Sin commune, Dak Rlap district, Dak Nong province
Sub-Project type	Repairing, upgrading productive rural infrastructure
Sub-Project Owner	Department of Agricultures and Rural Development (DARD) Dak Nong
Sub-Project owner's representative	PPMU Dak Nong
Address of Sub-Project Owner's representative	Tran Hung Dao street, Nghia Trung Ward, Gia Nghia Town, Dak Nong province
Name and title of head of sub-project owner's representative	Pham Huu Hao, Director
Telephone, fax and email details of sub-project owner's representative	Phone: 050130.545.809; Fax: 050130.545.809 Email: <a href="mailto:bqldaknong@gmail.com">bqldaknong@gmail.com</a>
Full name of the PPMU's environmental officer	Le Viet Hoa Phone: 0948395353; Fax: 05013.545.809 Email: <a href="mailto:quinle87@gmail.com">quinle87@gmail.com</a>
<b>III.2. SUBPROJECT DESCRIPTION</b>	
1. New or innovating or upgrading project	Repairing and upgrading irrigation and rural road infrastructures.
2. Components of the subproject	<p>Existing Quang Loc irrigation system has been built since 1995 by local people &amp; Quang Loc weir was upgraded in 2001. This irrigation system is serving only 50 ha of one crop wet rice &amp; 260 ha of coffee &amp; pepper</p> <p>The Subproject will repair and upgrade existing Quang Loc irrigation system, Village 2 of Dak Sin Commune to ensure water supply for 80 ha of two crops' wet rice, 422 ha of coffee &amp; pepper &amp; cash crops Sub-project include: 02 components</p> <p>(i) Irrigation component: Repair &amp; upgrade Quang Loc weir &amp; spillway, water intake and irrigation canals in Dao Nghia &amp; Dak Sin Commune</p> <p>(ii) Transportation component: Repair &amp; upgrade 8,775 m of 05 rural transportation routes in Dao Nghia &amp; Dak Sin communes.</p> <p>The details of components as in following table:</p>

DESCRIPTION	SUB-PROJECT DATA									
	Item	Length (m)	Irrigated area for (ha)						Structure	
			Wet rice		Coffee & pepper		Cash crops			
			Before SP (one crop)	After SP ( 2 Crops)	Before SP	After SP	Before SP	After SP	Before SP	After SP
	Quang Loc Weir		26	46	135	218	12	12	Soil	Concrete
	Dak Sim 1&2 Weir		24	34	125	174	18	18	Soil	Concrete
Rural road	8,767	50	80	260	392	30	30	Soil	Concrete	
Note : SP : Subproject										
Source: from Basic Design Report of Dak Rlap Sub-project										
2.1. Repair and upgrade irrigation component (Quang Loc weir, spillway, water intake & irrigation canals)	<p>The sub-project will upgrade existing irrigation head-works in Quang Loc commune and newly construct irrigation canals in Quang Loc and Dak Sin communes as following:</p> <p>(i) <i>Upgrading Quang Loc Weir</i> :</p> <ul style="list-style-type: none"><li>- The soil weir will be upgraded at the elevation +561 m, with length 305 m. The weir crest width is 5 m and combined with transportation function.</li><li>- The weir is constructed by soil, while the road in weir crest is made of 16 cm reinforced concrete M250, width 3.5 m. ‘ Weir slopes made of 8 cm reinforced concrete M200.</li></ul> <p>(ii) <i>Spillway</i>:</p> <ul style="list-style-type: none"><li>- The new spillway will be designed at elevation + 557.5 m, width 15 m including 5 cells (5 cells x 3m).</li><li>- Spillway will be made of reinforced concrete M250, and controlled by control valve. And a bridge (16 m x 4.3 m) is constructed for transportation passing through this point</li></ul> <p>(iii) <i>Quang Loc &amp; Dak Sin Irrigation canal</i></p> <ul style="list-style-type: none"><li>- Newly construction of canal with 4,513 m of length to supply water for both Quang Loc &amp; Dak Sin Commune</li><li>- New canal is structured by pipe HDPE D70 – 90 cm , slope : 0.0013; irrigation capacity will be <math>q=0.144-0.433 \text{ m}^3/\text{s}</math></li><li>- Total 22 offtakes &amp; water tanks are designed both sides of canal with 100 m per outlet; Offtakes are made of HDPE pipe (D=35cm) and tanks are made by reinforced concrete M200.</li></ul> <p>(iv) <i>Water intake</i></p> <p>Intake sluice will be built in underground, diameter D=90 cm, elevation +558 m &amp; made of reinforced concrete</p>									
2.2. Repairing and upgrading 05 transportation routes in Dao Nghia & Dak Sin communes	<p>There are 05 transportation routes will be upgraded under sub-project and technical information of such routes is as following:</p> <ul style="list-style-type: none"><li>- Upgraded roads are type B, with road width is 4.0 m including 3.0 m of road surface and 0.5mx2 walking sides.</li><li>- Pavement structure includes 16 cm of reinforced concrete M250;</li></ul>									

DESCRIPTION	SUB-PROJECT DATA												
	<p>bitumen lining paper ; 12 cm of crushed stone.</p> <ul style="list-style-type: none"><li>- Road compacting factor: <math>K \geq 0.95</math> and design speed is about 15 km/h.</li><li>- Sub-project will upgrade total 8.77 km of rural road with 05 routes, in which, 02 routes in Dao Nghia commune (including Dak Con route: length 1990 m &amp; Quang Loc route: length 1427 m) and Dak Sin commune (including Dak Sin road: length 4150 m, Dak Sin branch 1: length 600 m &amp; Dak Sin branch 2: length 600 m).</li></ul>												
Quantity and size of drainage culverts	<p>According to main report.</p> <p><i>Culverts:</i> there are total of 07 culverts on upgrading roads, including pipe &amp; box culverts. In specific, 03 culverts will be upgraded in Dao Nghia commune (including 02 pipe culverts, D = 80 cm in Dak Con route &amp; 01 pipe culvert, D = 80 cm in Quang Loc route) and 04 culverts will be upgraded in Dak Sin commune (including 02 pipe culverts (D = 80 cm) &amp; 02 box culverts (4x3.5x3.5m) in Dak Sin route.</p>												
Quantity of bridges	<p>There are 02 bridges will be newly constructed over weir and spillway in Quang Loc dam.</p>												
Irrigation and drainage structures	<p>The existing irrigation structures include Quang Loc weir, and irrigation soil canals:</p> <ul style="list-style-type: none"><li>- Quang Loc weir: Quang Loc weir was built in 1995 by local people and upgraded with concreted slopes in 2001, including 01 spillways, 01 water intake and 500 m of irrigation canal, catchment area is 47.6 km<sup>2</sup></li><li>- Quang Loc irrigation canal: This irrigation canal is responding for 173 ha of agricultural land including 26 ha of one crop-wet rice, 135 ha of coffee, pepper and 12 ha of cash crops.</li><li>- In addition, in the sub-project area, Dak Sin commune, has also Village 2 weir &amp; 02 irrigation canals (2,000 m), no water intake was built since 1998 by local people, which is serving for 167 ha of agricultural land. Including 24 ha of one crop-wet rice, 125 ha of coffee, pepper and 18 ha of cash crops. Catchment area is 53.16km<sup>2</sup></li></ul> <p>However, sub-project only upgrades Quang Loc weir and its irrigation canals.</p>												
Area of site clearance <sup>1</sup>	<p>The sub-project activities will be taken place mainly in existing dams &amp; rural roads. However, the constructions will acquire rice fields and perennial land (pepper &amp; coffee plants) both temporary and permanent, thus require land clearance. In which the temporary acquisition is on vacant land thus not required compensation and returned after completion work, while the number of acquired permanent land is 8.0214 ha and detailed as following table:</p> <table><tr><th rowspan="2">No</th><th rowspan="2">Item</th><th colspan="2">Commune</th><th rowspan="2">Total</th></tr><tr><th>Đắk Sin</th><th>Đạo Nghĩa</th></tr><tr><td>A</td><td>Affected HHs</td><td>114</td><td>97</td><td>211</td></tr></table>	No	Item	Commune		Total	Đắk Sin	Đạo Nghĩa	A	Affected HHs	114	97	211
No	Item			Commune			Total						
		Đắk Sin	Đạo Nghĩa										
A	Affected HHs	114	97	211									

<sup>1</sup> According to detailed measure survey ( DMS ) , updated by 31.11.2016

DESCRIPTION	SUB-PROJECT DATA				
	<b>B</b>	<b>Affected land</b>	<b>41,150</b>	<b>39,064</b>	<b>80,214</b>
	1	Wet-rice (m <sup>2</sup> )	6,006	3,086	9,092
	2	Farm products (m <sup>2</sup> )	2,189	1,796	3,985
	3	Perennial (m <sup>2</sup> )	32,634	34,182	66,816
	4	Aquaculture (m <sup>2</sup> )	321	-	321
	<b>C</b>	<b>Affected trees</b>	<b>2,196</b>	<b>2,633</b>	<b>4,829</b>
	The roads, basically, are along their old alignment with some minor adjustments. The main site clearance is fence, trees and crops. Local people voluntarily agreed to donate their land.				
Other roads that intersect with subproject's roads	The upgraded roads in two communes of Dak Sin and Quang Loc are interconnecting villages in Dak Sin and Dao Nghia communes. In specific: <ul style="list-style-type: none"><li>- Subproject areas need to be accessed through Provincial road TL 685 in Dao Nghia &amp; Dak Sin communes.</li><li>- Upgraded road of sub-project intersects with Dao Nghia &amp; Dak Sin commune roads – those are soil roads.</li></ul>				
The main streams that across the road <ul style="list-style-type: none"><li>- Rivers</li><li>- Reservoirs</li><li>- Other streams</li></ul>	The Da R'Keh spring is part of Dong Nai river network, started from mountain (+700 m of elevation) flows along National Highway No.14, and its basin is in Dak Rlap district with area of 321 km <sup>2</sup> .  In the sub-project, there are 04 reservoirs: Dak Con, Cau Tu and Quang Loc reservoirs in Quang Loc commune and reservoir in Village No.2, Dak Sin commune. These reservoirs received water from Da R'Keh spring. There are also some streams flowing through communes.				
Number of hills and mountains	Dak Rlap district has different topographies but categorized into two distinct: plateau and mountain. The small plain areas are located along National Highway No.14 and inter-communes' roads.  Dao Nghia and Dak Sin communes located next to Provincial road (TL 685) on the mountain area that difficult for transportation; The topography of sub-project area is mountains and hills. In addition, this area also characterized by small streams/ spring network, and the average elevation of sub-project area is about +600 m.				
III.3. Construction activities					
Commencement (month/year)	Planned: Quarter I of 2017				
Finish (month/year)	Planned: Quarter IV of 2018				
Number of construction worker	Estimated around 100 workers				
Are there any camps for workers? Yes/no	Yes, there will be 02 camps located in 02 communes of Dao Nghia and Dak Sin, for about 100 workers				
Will the construction take place in rainy	In rainy season, there could be some activities such as directing flows, site preparation, materials gathering, building camps, temporary home				

DESCRIPTION	SUB-PROJECT DATA
seasons?	and dam slopes etc .... The main activities will be implemented in the dry season.
Number of concrete mixers	The sub-project will employ 06 concrete mixers with the capacity 500 l each.
Construction methods	<p>Construction of weir &amp; spillway:</p> <ul style="list-style-type: none"> <li>- Stage 1: Building a part of weir at two banks : and constructing spillway, intakes. During this phase water will be diverted crossing old stream .</li> <li>- Stage 2: Building a part of weir at stream bed : After completing stage 1 (completing part of weir at two banks, spillway ) divert water flow passing new spillway and embank coffer-dam in stream bed to implement jointing work.</li> </ul> <p>Construction of transportation road;</p> <ul style="list-style-type: none"> <li>- The sequence of road construction as following: (1) clearing constructed section by handwork, (2) leveling constructed section by bulldozer, (3) embanking/excavating and then compacting constructed section by roller with <math>k \geq 95</math>, (4) paving macadam and reinforced concrete, and (5) completing constructed section.</li> </ul> <p>Construction is implemented section by section to remain transport function of upgraded road during construction period.</p>
Temporary location and area occupation and material source	<p><b>Source of materials:</b></p> <ul style="list-style-type: none"> <li>- Embankment soil: use from 01 borrow pit (0.262 ha) in Quang Tho village, Dao Nghia Commune, where is behind the People Committee Office, and its capacity ensures for whole sub-project. The distance from this borrow pit to Quang Loc dam is 500 m, to Quang Loc canal is 2 km and to Dak Sin construction site is about 6 km (Agreement minute for borrow pit is attached in appendix 3);</li> <li>- Other construction materials will be purchased from Kien Duc town (20km) and Gia Nghia Town (40 km);</li> <li>- Source of water &amp; electricity</li> <li>- Water is already in 02 reservoirs;</li> <li>- Electric: used from grid, and supplemented by 04 generators if necessary.</li> </ul>
Measures to manage and balance excavation/ embankment spoil/stone	<p>The total excavated soil for two reservoirs is 25,943 m<sup>3</sup> while embankment volume is 10,467 m<sup>3</sup>, in which, the main excavation is from constructing canals, while main embankment (10,000 m<sup>3</sup>) is for Quang Loc new dam construction.</p> <p>The soil will be excavated from local borrow pit (in Quang Tho village, Dao Nghia commune) for whole project, thus the amount of soil will be excavated is approximate with embankment purpose.</p> <p>The discarded soil will be dumped at the disposal site in Quang An Village with 2.246 ha has been agreed by Dao Nghia CPC (Appendix 3), where average distance about 4 km to sub-project site. In addition, this land does not have to compensate.</p>
Approximate volume of construction materials	Approximated volume construction materials include 10,467 m <sup>3</sup> of embanked soil, 22,147 m <sup>3</sup> of reinforced cement from M150 – M250; 48.544 tons of steel; 128 m <sup>3</sup> of crushed stone; and , free stone,

DESCRIPTION	SUB-PROJECT DATA	
	framework wood etc.	
Number and condition of vehicles and construction equipment	The subproject will employ 10 Bulldozer 110CV and 20 excavators 0.8 - 1.25m <sup>3</sup> ; 40 trucks from 7 – 10 tone; 16 concrete vibrating machines from 16 – 25 tone; 08 cranes; 04 electrical generators;  Such vehicles and equipment will be in good conditions and have periodical verifications.	
III.4. Operation and maintenance activities		
Maximum speed	15 km/h	
Designed load	Weight < 6 tons	
Designed vehicles density	50 vehicles/day-night	
Maintenance activities	<p>After completion, The Irrigation Works Units of DARD of Dak Nong will be the responsible agency for management of sub-project. This Units will accompany with PC of Dak Rlap district to support for operational activities, which are directly performed by The Exploitation of Irrigation Works Co.,ltd. of Dak Rlap</p> <p><b>For operation:</b></p> <p>(i) Manage operation and protection of headwork:</p> <p>Manage operation of reservoirs, water intakes, flood spillway, canals; regularly open and close valves, as well as monitor water level etc.;</p> <p>Management type of 05 transportation routes in Dao Nghia &amp; Dak Sin communes and replace and/or repair traffic signs;</p> <p>(ii) Manage water on fields:</p> <p>Manage irrigation area, types of plants, water distribution plans, etc.</p> <p><b>For regular maintenance</b></p> <ul style="list-style-type: none"><li>- Repair &amp; cleaning weir crest, canals;</li><li>- Remove nets of animals &amp; insects;</li><li>- Dredging water intakes and outlets, canals, drains;</li><li>- Repairing stone and roofs concrete of weir, culverts;</li><li>- Repairing damaged surface of road and/or traffic signs;</li><li>- Maintain machinery</li></ul> <p><b>For frequency maintenance (1/7 years)</b></p> <p>Repairing /replacing broken parts as frequently maintained as needed in addition to planned periods;</p>	
V. Resettlement No relocated HHs, only land acquisition but affected peoples has agreed to donate their land. (detailed information from Detailed Measurement Survey)		
Affected households	211	
Severely affected households	0	
Relocated households	0	
Total acquired area (ha)	Temporarily = N/A	Permanently = 8.0124

DESCRIPTION	SUB-PROJECT DATA	
Acquired agricultural land area (ha)	Temporarily = N/A	Permanently = 7.9803
Acquired forestry land area (ha)	Temporarily = 0	Permanently =0
Acquired aquaculture land area (ha)	Temporarily = 0	Permanently =0.0321
Acquired residential land area (ha)	Temporarily = 0	Permanently =0
Acquired garden land area (ha)	Temporarily = 0	Permanently =0
Other acquired lands (ha)	Temporarily = 0	Permanently =0
<b>III.5. The sub-project cost</b>		
Total subproject cost (VND)	Estimated 63,100,403,000 VND ( 2,894,514 USD, 1 USD =21,800 VND)	



Ngày gửi / Date: 10/03/2016

BAN QUẢN LÝ DỰ ÁN TỈNH ĐẮK NÔNG  
PROJECT MANAGEMENT DAK NONG PROVINCE

THÀNH PHỐ HỒ CHÍ MINH

CÔNG TY CỔ PHẦN TƯ VẤN VÀ XÂY DỰNG VIỆT THÀNH  
VIET THANH CONSULTING AND CONSTRUCTION JOINT STOCK COMPANY

DỰ ÁN: PHÁT TRIỂN CƠ SỞ HẠ TẦNG NÔNG THÔN PHỤC VỤ SẢN XUẤT CHO CÁC TỈNH TÂY NGUYÊN  
TIỂU DỰ ÁN: SỬA CHỮA NÂNG CẤP CÔNG TRÌNH THỦY LỢI QUANG LỘC, THÔN 2 ĐẮKSIN HUYỆN ĐĂK LẤP, TỈNH ĐĂK NÔNG  
PROJECT: DEVELOPMENT OF RURAL INFRASTRUCTURE PRODUCTION SERVICE FOR HIGHLANDS PROVINCE  
SUB-PROJECT: REPAIRING AND UPGRADING OF IRRIGATION WORK QUANG LOC, VILLAGE 2 DAKSIN DAK LAP DISTRICT, DAKNONG PROVINCE

**SƠ ĐỒ TUYẾN ĐƯỜNG QUANG LỘC - ĐẮKSIN**  
**DIAGRAMS ROUTES QUANG LOC - DAKSIN**

Giám đốc - Director	Wu Thị Minh Thu	No-16TK-DRL-SDT
CN Thiết kế - Design manager	Phan Duy Hợp	HT: 03/2016 Tỷ lệ
Thiết Kế - Designed by	Nguyễn Văn Diệp	Fax: 08 610 23 59
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VIỆT THÀNH  
FOR CONSULTING AND CONSTRUCTION



#### IV. DESCRIPTION OF EXISTING ENVIRONMENT

Results of survey and baseline environment data of the subproject area were collected by the safety policy consultant (SPC) in April, 2015 and could be summarized as following:

**Table 2: Baseline Environment Data**

DATA ITEM	SUBPROJECT DATA
<b>4.1 PROJECT LOCATION</b>	
Town	The sub-project is located at 02 communes of Dao Nghia and Dak Sin
District	Dak R'lap
Province	Dak Nong
Geographical position	<p>The sub-project is in the South of Dak Nong province and in the Southwest of Highlands. The coordinates of the subproject are as follows:</p> <p>From X: 11.846519 to X: 11.863020</p> <p>From Y: 107.528822 to Y: 107.567259</p>
<b>4.2 NATURAL ENVIRONMENTAL CONDITIONS</b>	
Air quality <sup>2</sup>	<ul style="list-style-type: none"> <li>- The subproject is located in the mountainous area of Highlands (Dak Sin &amp; Dao Nghia communes), where is highly covered by green space with high absorption capacity to air pollutants. Therefore, no sign of the air pollution and degradation have been observed/recorded yet in sub-project area.</li> <li>- Through site observations in April 2015 &amp; June 2016, Aluminum Nhon Co Factory, a mine industry factory in Dak R'lap District, is causing to air pollution, especially dust during dry season, because of its transportation activities. However, this factory is located in Nhon Co town and its activities distance about 30 km to sub-project area.</li> <li>- In addition, The Center of Monitoring of Resources &amp; Environment has monitored physical environmental condition in Dak Nong Province twice per year. The latest monitoring (from 15 – 31/05/2016) was sampled &amp; analyzed 05 ambient air quality samples in the most potential polluted places in Dak R'lap district (Kien Duc, Nhon Co, Dak Ru &amp; in Dak Rlap landfill). The results indicate that only dust parameter (331 – 316 <math>\mu\text{g}/\text{m}^3</math>) in Nhon Co T-junction &amp; Dak Ru commune was above National Technical regulation for ambient air quality (300<math>\mu\text{g}/\text{m}^3</math>), while all other parameters were within allowed limit (Appendix 4). However, as described above, sub-project area is distanced from such polluted area.</li> </ul>
Noise and vibration	<ul style="list-style-type: none"> <li>- As mentioned above, the sub-project is in mountainous area with low traffic density. In addition, industrial/mining activities are not developed yet in Dao Nghia and Dak Sin communes, therefore noise and vibration are mainly caused by traffic activity but quite low.</li> </ul>

<sup>2</sup> The monitoring locations for ambient air quality: KK20\_HT is at Kien Duc bridge (X 392374; Y 1327672); KK21\_HT is at Nhon Co T-junction (X 400101; Y 1324922); KK22\_HT is at Kien Duc market (X 392270; Y 1326614); KK23\_HT is at Dak Ru residential area (X 379358; Y 1316942); and KK24\_HT is at Dak R'lap landfill (X 389923; Y 1327161)

DATA ITEM	SUBPROJECT DATA
	<p>- The monitoring results of The Center of Monitoring of Resources &amp; Environment in 05/2016 for noise and vibration (same sampling places with ambient air) indicate that noise (from 47.5 – 59.9 dBA) in the most potential polluted places in Dak R'lap district still within regulation of National Technical Regulation on noise QCVN 26:2010/BTNMT. Therefore, it could be concluded that the existing noise condition in sub-project area is not polluted</p>
Climate and natural disasters	<p>The subproject area is influenced by the tropical monsoon and plateau tropical monsoon climate. The year is divided into two distinct seasons:</p> <ul style="list-style-type: none"> <li>- The rainy season is from May to October (accounting for approximate 90% of annual rainfall).</li> <li>- The dry season is from November to April of the next year (accounting for approximate 10% of annual rainfall). May and June are the transitional months (beginning of rainy season).</li> <li>- According to meteorological statistic data of Dak Nong province (taking from Buon Me Thuot meteorological station):</li> </ul> <p><b>The temperature of this areas:</b></p> <ul style="list-style-type: none"> <li>▪ Average annual temperature: 23.56°C</li> <li>▪ The highest temperature: 27.5°C</li> <li>▪ The lowest temperature: 20.1°C</li> </ul> <p><b>The rainfall of this areas:</b></p> <ul style="list-style-type: none"> <li>▪ The annual rainfall : 2510 mm</li> <li>▪ The average rainy season rainfall April –November) : make up about 85-90% of average year rainfall : 2130 - 2260 mm</li> <li>▪ The average dry season ( December – March ) : make up only 10 -15% of average year annual : 250 - 380 mm</li> </ul> <p><b>Air humidity:</b></p> <ul style="list-style-type: none"> <li>▪ Humidity average /year: 82.9%</li> <li>▪ The highest humidity month: 8, 9, 10 (87-93%)</li> <li>▪ The lowest humidity month: 1, 2, 3 (71-81%)</li> </ul> <p><b>Sunshine hour:</b></p> <ul style="list-style-type: none"> <li>▪ Total average number of sunshine hours each year is 2,304.2 hours.</li> <li>▪ The highest number of sunshine hours per month is 272.6 hours.</li> <li>▪ The lowest number of sunshine hours per month is 81.7 hours.</li> </ul> <p><b>Wind:</b></p> <p>According to the meteorological data at the Buon Me Thuat station (the closest station) in 30 years (1979 - 2008), the wind speed corresponding to its frequency and direction is determined as follows:</p> <ul style="list-style-type: none"> <li>▪ Average wind speed is 2.7 m/s. Maximum wind speed is 20 m/s.</li> </ul>

DATA ITEM	SUBPROJECT DATA
	<ul style="list-style-type: none"> <li>▪ Major wind direction is Northeast (NE), South-west (SW). (Source: Statistical Yearbook of Dak Nong province, 2013)</li> </ul> <p><b>Natural Disasters:</b></p> <p>A report by Dak Nong – Department of Agricultural and Rural Development (DARD) said that there are typically natural disasters in Dak Nong in recent years (i) sweeping floods; (ii) landslides; (iii) floods; and (iv) droughts</p> <p>- Such disasters have been occurred in Dak Nong in history for example: sweeping floods occurred in Dak Glong &amp; Tuy Duc districts (2012) and in Quang Tan commune – Tan Duc district (2013); landslide occurred in Dak Song, Dak Dlong, Dak R'lap, Tuy Duc districts and Gia Nghia Town; flood occurred in Krong No, Cu Jut districts &amp; Gia Nghia (2006, 2012 and 2013); while recent historical drought occurred in spring – summer crop in 2015. Disasters do not only cause property losses but also human losses.</p>
Topography and soil	<ul style="list-style-type: none"> <li>- The subproject area is dominated by tectonics of plateaus; the terrain is relatively complex. The irrigated areas of sub-project are covered mainly by wet rice, coffee and pepper fields, while the southeast area of Quang Loc &amp; Dak Sin communes is forest land and part of Dong Nai river.</li> <li>- Sub-project is located on an area with main categories of soil as follows: <ul style="list-style-type: none"> <li>○ Soil in Quang Loc reservoir: <ul style="list-style-type: none"> <li>▪ Layer 1: Clay mixed by basalt soil reddish brown – grey brown colors with type hard &amp; soft plastic clay</li> <li>▪ Layer 2: gravel basalt soil mixed by clay , grey – dark brown couloirs with hard type .</li> <li>▪ Layer 3: Clay mixed by basalt , ashy – livid- red brown couloirs with hard plastic type</li> </ul> </li> <li>○ Soil in connecting road to Quang Loc reservoir &amp; in borrow pit: is basalt soil mixed by clay , red brown color with hard plastic type .</li> <li>○ Soil in Village 2 of Dak Sin commune: <ul style="list-style-type: none"> <li>▪ Layer 1: Clay mixed by basalt, brown- yellow brown- livid colors with hard plastic type</li> <li>▪ Layer 2: Clay mixed by basalt &amp; Laterite stone, dark – yellow brown &amp; ashy brown grey – red brown colors , hard colors .with type of hard – semi hard plastic</li> <li>▪ Layer 3: Clay mixed by basalt, ashy grey &amp; yellow grey colors with soft plastic type</li> </ul> </li> <li>○ Soil in connecting road to reservoir in Village 2 of Dak Sin commune: includes 2 layers: <ul style="list-style-type: none"> <li>▪ Layer 1: Clay mixed basalt soil, deep red brown colors with hard plastic type .</li> </ul> </li> </ul> </li> </ul>

DATA ITEM	SUBPROJECT DATA
	<ul style="list-style-type: none"> <li>Layer 2: Clay mixed by basalt soil &amp; stone, dark &amp; deep brown colors with hard plastic type</li> </ul>
Surface water resource	<ul style="list-style-type: none"> <li>The Da R'Keh spring is part of Dong Nai river network and supply water for sub-project area.</li> <li>There are 04 reservoirs in the sub-project area including Dak Con, Cau Tu and Quang Loc reservoirs (constructed in 1995 and upgraded in 2001) in Dao Nghia commune. These reservoirs received water from Da R'Keh spring. There are also some streams flowing through communes. These water sources are for agricultural activities of the local people.</li> </ul>
Underground water	<ul style="list-style-type: none"> <li>Groundwater in subproject area is without pressure groundwater and located at the depth of 5 m - 30 m and high capacity at depth of 40 – 90 m. Local people exploit it for domestic purposes.</li> </ul>
Water quality <sup>3</sup>	<ul style="list-style-type: none"> <li><i>Surface water quality:</i> Although there are no analyzed results for surface water quality, site assessment and discussion with local people indicate that the surface water exploited from Da R'Keh spring is used for irrigation only. The water quality is visually good condition in dry season, but contaminated by sediment during rainy season especially when runoff water passing through basalt soil layer spring water is in red/yellow red color.</li> <li>The Center of Monitoring of Resources &amp; Environment has monitored physical environmental condition in Dak Nong Province twice per year. The latest monitoring (from 15 – 31/05/2016) was sampled and analyzed 03 surface water samples in Dak R'lap district at Kien Duc bridge, Nhan Co Lake, and Lake where discharged from Alumni Factory. The results indicate that all 14 parameters were within legal requirement of surface water quality (QCVN 08-MT:2015/BTNMT) (Appendix 4).</li> <li><i>Groundwater quality:</i> Local people are using ground water for domestic purposes. Although there are no analyzed results for groundwater quality, site observation and local people discussion indicate that groundwater in sub-project area is visually not polluted yet.</li> <li>The latest monitoring program (from 15 – 31/05/2016) was sampled &amp; analyzed 06 groundwater samples in Dak R'lap district. The results indicate that all 15 analyzed parameters were within allowed limits of ground water quality (QCVN 09-MT:2015/BTNMT) (Appendix 4)</li> </ul>
Flooding	<ul style="list-style-type: none"> <li>The sub-project located in the mountain area thus flood rarely occurs. However, with high slope, this mountain area is affected by runoff causing sweeping flood and landslide, valleys could emerge floods in rainy season.</li> </ul>

<sup>3</sup> Surface water sample locations: NM17\_HT at Kien Duc bridge (X 0392374; Y 1327672); NM18\_HT at Nhon Co Lake (X 0399799; Y 1324390) & NM19\_HT at Nhon Co lake (after discharge point of Alumni Factory) (X 0398421; Y 1323924).

Ground water sample locations: NN17\_HT at Nhan Co T-Junction (X 0400019; Y 1324922); NN18\_HT at Nguyen Thi Tuyet household in Kien Duc Town (X 0392319; Y 1326669); NN19\_HT at General Hospital in Kien Duc Town (X 0393985; Y 1327964); NN20\_HT at Tran Thi Phuong household in Nhan Dao commune (X 0398016; Y 1322630); NN21\_HT at Tran Thi Thu Thuy household in Dak Ru commune (X 0380212; Y 1317109); and NN22\_HT at Nguyen Nhu Thuan household near General Hospital of District (X 0394350; Y 1328196).

DATA ITEM	SUBPROJECT DATA															
	- In the past, landslide and flood have been recorded in Dak R'lap District, for example in August, 2007, flood caused inundation and 600 households had to evacuated including Dak R'lap residents. However, no any cases of flood/landslide recorded in sub-project area.															
Terrestrial fauna and flora	<ul style="list-style-type: none"><li>- The main flora in the subproject area includes agricultural crops (wet rice, coffee, pepper, rubber, etc.), and natural forest but distance (6 10 km) from sub-project area.</li><li>- The downstream of irrigation works system passing through Quang Loc, Dak Sin communes with development of agriculture for total 80 ha wet-rice, 422 ha coffee, pepper and other cash crops</li><li>- Terrestrial fauna in the area includes cattle, pigs, chickens, etc. and wild animals such as squirrels, rabbits, birds, mice ...</li><li>- No terrestrial fauna and flora species listed in the Red Data Book of Vietnam.</li></ul>															
Aquatic fauna and flora	<ul style="list-style-type: none"><li>- Aquatic fauna and flora into the subproject area are characterized by those in flora of Da R'keh spring and in reservoirs, streams receiving water from Da R'keh spring.</li><li>- There is no data available about the aquatic flora and fauna in these water bodies. Through field visits, aquatic fauna species in spring, reservoirs had been found including freshwater fish, shrimp, etc.; and as for flora, it is evident that shrubs, water hyacinth, algae, glass are dominant species.</li><li>- No aquatic flora and fauna species in the subproject area are listed in the Vietnam's Red Data Book.</li></ul>															
Protected areas	<ul style="list-style-type: none"><li>- The Dao Nghia &amp; Dak Sin communes have natural boundary is Dong Nai river, where other side is Nam Cat Tien National Park. The distance from sub-project area to natural forest boundary is from 6 – 10 km (in which, the buffer zone 3 – 5 km is plantation forest). Therefore, sub-project will not effect on this protected area.</li></ul>															
4.3 ENVIRONMENTAL AND SOCIAL CONDITIONS																
Unexploded bombs, mines	Unexploded ordnance (UXO) survey is carried out by Truong Son Construction Corporation – Ministry of National Defence & Completed on 27 November 2015															
Land use	<ul style="list-style-type: none"><li>-Land adjacent the sub-project area includes: (i) agriculture and forestry land; (ii) non-agricultural land, distributed in the communes as follows:</li></ul>															
	<table><tr><th>Content</th><th>Dao Nghia Commune</th><th>Dak Sin commune</th></tr><tr><td>Total area (ha)</td><td>5793.07</td><td>10096.00</td></tr><tr><td>Agricultural land (ha)</td><td>3235.46</td><td>9087.83</td></tr><tr><td>Forest land (ha)</td><td>2218.24</td><td>2779.12</td></tr><tr><td>Aquaculture (ha)</td><td>8.91</td><td>75.20</td></tr></table>	Content	Dao Nghia Commune	Dak Sin commune	Total area (ha)	5793.07	10096.00	Agricultural land (ha)	3235.46	9087.83	Forest land (ha)	2218.24	2779.12	Aquaculture (ha)	8.91	75.20
	Content	Dao Nghia Commune	Dak Sin commune													
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	Agricultural land (ha)	3235.46	9087.83													
	Forest land (ha)	2218.24	2779.12													
Aquaculture (ha)	8.91	75.20														

DATA ITEM	SUBPROJECT DATA		
	Residential & Non-agricultural land (ha)	300.91	907.40
	(Source: summary according to Dak R'lap Statistical Yearbook 2014)		
Residential area near the subproject	<p>-Residents in the subproject area mostly concentrate at the center of the commune or areas along the roads (provincial road TL 685 and commune roads). The smallest distance from residential areas to the roads is about 5-10 m (See located of residential areas in Figure 1).</p> <p>-The residential areas within/nearby sub-project include:</p> <ul style="list-style-type: none"><li>○ Dao Nghia commune: Quang Thanh, Quang Tho, Quang Phuoc, Quang Chanh, Quang Loc, Quang An and Quang Dat villages</li><li>○ Dak Sin commune: Village No.1, 2, 3, 4, 5, 10 &amp; 13</li></ul>		
Rural infrastructures	<p>- Dao Nghia commune: by 2014, Dao Nghia commune has 01 kindergarten, 01 elementary and 01 secondary schools.</p> <p>- Dak Sin commune: by 2014, Dak Sin commune has 01 kindergarten, 02 elementary and 01 secondary schools.</p> <p>(Source: Statistical Yearbook of Dak Rlap, 2014)</p> <p>- Each commune has its own communal clinic center.</p> <p>- Road network: besides the provincial road TL685 and main communal roads are concreted the roads in Dao Nghia and Dak Sin are soil roads and difficult for travelling during rainy time.</p> <p>- Irrigation system: though there are 04 reservoirs within 02 communes, but those are soil dams have been built since 1990s and being deteriorated. Those dams and their irrigation canals are serving for agricultural products in Dao Nghia and Dak Sin communes.</p> <p>- In the sub-project are, there is a low-voltage power system parallel to the upgraded road. However, according to observation, this power line is at least 3 m from the edge of the road, so this power line will not be affected by the sub-project construction activities.</p>		
Agriculture and aquaculture	<p>- Annual and perennial crops of the subproject area are cashew, pepper, rubber, coffee, tea, wet rice, maize, sweet potato, etc. The crop areas of communes are as follow:</p> <ul style="list-style-type: none"><li>○ Annual crops in Dao Nghia commune: 98.4 ha</li><li>○ Perennial crops in Dao Nghia commune: 2,498.5 ha</li><li>○ Annual crops in Dak Sin commune: 204.1 ha</li><li>○ Perennial crops in Dak Sin commune:3,887.9 ha</li></ul> <p>- The total aquaculture land in Dao Nghia and Dak Sin commune is about 84 ha of water surface.</p> <p>(Source: Statistics of Dak Rlap, 2014)</p> <p>- Surface water in the subproject area taken mainly at 04 reservoirs including Dak Con, Cau Tu, Quang Loc reservoirs in Quang Loc commune and reservoir in Village No.2.</p>		

DATA ITEM	SUBPROJECT DATA
Population	<ul style="list-style-type: none"> <li>- Statistics by 2014 of Dak R'lap district: <ul style="list-style-type: none"> <li>o The number of households: 3,115.</li> <li>o Population: 81,627 persons</li> <li>o Population growth: 1.42 % / year</li> <li>o Poverty rate: 14.09%</li> </ul> </li> <li>- Statistics by 2014 of Dao Nghia commune: <ul style="list-style-type: none"> <li>o Population: 4,975 persons</li> <li>o Population growth: 2.1 % / year</li> <li>o Poverty rate: approximate 10%</li> </ul> </li> <li>- Statistics by 2014 of Dak Sin commune: <ul style="list-style-type: none"> <li>o The number of households: 2,273</li> <li>o Population: 7,747 persons</li> <li>o Population growth: 1.24 % / year</li> <li>o Poverty rate: approximate 7 %</li> </ul> </li> </ul> <p style="text-align: right;"><i>(Source: Statistics of Dak Rlap, 2014)</i></p>
Ethnic minority groups	<ul style="list-style-type: none"> <li>- Most of people in the subproject area are Kinh (85.7 % and migration from the North) and some local ethnic minorities counted for 14.3% of total population (Tay, Thai, Muong, Kho Me, Hoa, Nung, H Mong, Dao, Ede, San Chay, Cham, Co Ho, San Diu, HRe, Mnong, Tho, Cho Ru etc.).</li> </ul>
Livelihood	<p><b>Dao Nghia</b> commune of Dak Rlap district:</p> <ul style="list-style-type: none"> <li>- Economic structure: including agriculture with wet rice, rubber, coffee, pepper; agricultural service industry; and forestry.</li> <li>- This commune has 4,975 people including 2,322 people in the labor ages accounting for 46.6% of the total population, in which agricultural labor accounts for main labor force.</li> <li>- GDP per capita in 2014 is 36 million VND</li> </ul> <p><b>Dak Sin</b> commune of Dak Rlap district:</p> <ul style="list-style-type: none"> <li>- Economic structure: Agroforestry is mainly economic sector contributing to GDP of commune with wet rice, avocado, durian, lemon, coffee, pepper, rubber etc., and pig farms; the construction is merely small construction services; while trading and service is serving for local people in commune and transporting agricultural products.</li> <li>- Number of labors: 4,226 people, accounting for 54.6% of the total population, in which agricultural labor accounts for main labor force.</li> <li>- GDP per capita in 2014: 34,000,000 VND.</li> </ul>
Cultural and natural heritages	<ul style="list-style-type: none"> <li>- In the subproject area, there are no cultural and natural heritages.</li> <li>- There is only Khai Hoa temple in Dao Nghia commune, but located in</li> </ul>

DATA ITEM	SUBPROJECT DATA
	Quang Phuoc village where is about 2 km to Quang Loc reservoir.
Public health	- Each commune has one commune health center, which can diagnose and treat simple and most common diseases such as diarrhea, red eye, respiration and skin diseases.
Traffic and transportation	- In the subproject area, there are only roads with very low traffic density which just serves for domestic traffic of local people. - The main means of transportation include pedestrians, bicycles and motorcycles.



## V. ENVIRONMENTAL IMPACT SCREENING

### 5.1 Positive impacts

Constructing the subproject "**Repairing, upgrading Quang Loc irrigation works system, Village No.2, Dak Sin commune, Dak Rlap district, Dak Nong province**" will bring positive impacts on environment and society as follows:

- It will ensure water for irrigating stably for 80 ha of wet-rice & 422 ha of coffee, pepper and farm products in Dao Nghia and Dak Sin communes, especially during the dry season, improving the growth of plants and trees as well as improving productivity and related income of local people.
- It will also contribute to stabilize groundwater resources because of less exploitation for irrigation when surface water is available;
- The development of rural road infrastructure improves the traffic and links residential to production areas, reducing the burden and cost in transporting materials fertilizers and agriculture products. It will also create favorable conditions for mechanizing agricultural production, bringing scientific advances into the producing areas that will induce more intensive cultivation and subsequent increased crop yields. The sub-project also reduces cultivation and labor costs and improves income of local peoples in the subproject area.
- The sub-project will also contribute to improving living conditions, livelihoods and environment in sub-project areas and in reducing poverty.

### 5.2 Negative impacts

However, the sub-project could also create several negative impacts, especially during construction phase, which need to be managed through appropriate mitigation measures. The negative impacts from subproject could be summarized in the following table:

**Table 3: Environmental impact screening**

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
I. Pre-construction phase					
Risk when detecting unexploded ordnance	Yes	Minor	Negative	Temporary	Unexploded ordnance (UXO) survey was carried out by Truong Son Construction Corporation – Ministry of National Defence & Completed in 27 November 2015 ( See Acceptance Minutes in Annex 6).
					<b>Description:</b> According to detail measurement survey the sub-project will acquire further 8.0124 ha of agricultural land permanently for both road & irrigation components, such acquisition will affect 211 households. In which, the acquired land in Dak Sin commune is 4.1150 ha, effects on 114 households while those numbers are 3.9064 ha & 97 households in Dao Nghia commune. The acquired lands are growing wet-rice (0.9092 ha), farm products (0.3985 ha), perennial

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
Impacts on HHs due to site clearance (land acquisition)	Yes	Minor	Negative	Both Temporary & Permanent	<p>plants (6.6816 ha) and aquaculture land (0.0321 ha). However, no affected households is significant affected (the losing land is about 0.03% - 8.05% total production land of their own)</p> <p>In addition, sub-project will also acquire temporary land for construction activities such as material gathering, camps and borrow pits, however, such activities will be located on public and vacant lands, which do not require land acquisition land will be returned after construction phase completed.</p> <p><b>Affected Objects:</b> 211 HHs affected in Village No.1 &amp; No.2 of Dak Sin commune and Quang Loc village of Dao Nghia commune;</p> <p><b>Affected level:</b> Social impact due to land acquisitions is minor. Each HH lost insignificant production land and HHs will get beneficiary from upgraded road and irrigation systems that it creates favorable condition for travelling from resident area to the production area &amp; surrounding areas and ensuring water for irrigating farm products as well. However, compensation program still need to be implemented to reduce economic burdens for affected households.</p> <p><b>Location:</b> In Village No.1 and No.2 of Dak Sin commune and Quang Loc village of Dao Nghia commune and borrow pit in Dao Nghia CPC commune.</p> <p><b>Time:</b> Temporary and permanent</p>
					<p><b>Description:</b> Although the construction period is only 12 months, it can still cause temporary less water for irrigation and negative impacts on transportation to locals during harvesting activities. This could potentially have an impact on the socio-economic situation of local people. In fact, main construction activities of reservoirs, head-works, have to be implemented mainly in the dry season,</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
Reducing crop productive due to inappropriate construction plan in term of time	Yes	Minor	Negative	Temporary	<p>which is concurrent to the cultivation period. So, this impact needs to be managed and mitigated carefully.</p> <p><b>Affected objects:</b></p> <ul style="list-style-type: none"> <li>- Crops of local peoples irrigated by subproject reservoir and canals</li> <li>- Local people cultivating crops with water supplied by irrigation systems as well as using roads of the sub-project in Dao Nghia &amp; Dak Sin communes.</li> </ul> <p><b>Affected level:</b> This impact minor, due to i) flow diversion method will be applied to ensure water follow on all upgraded reservoirs and canals, and ii) construction of works and road will be implemented section by section which could help to reduce interruption period.</p> <p><b>Location:</b> Beneficiaries areas are irrigated by water from these irrigation systems and upgraded roads in Dao Nghia &amp; Dak Sin communes.</p> <p><b>Time:</b> Temporary during preparation phase and construction phase</p>
<b>II. Construction phase</b>					
					<p><b>Description:</b> The construction activities, especially excavating, filling/ embankment work and storing materials along the roads could create debris and/or cause materials falling into surface water sources. Landslides could occur in borrow pit at Dao Nghia commune CPC since they located at slope area. Soil erosion and landslide could cause increasing in sediments and turbidity in surface water, obstructing water flows. The consequence could cause negative impacts to the rice fields in Dao Nghia and Dak Sin communes where are located near by the construction sites. The highest risks location of land slide and soil erosion could be listed as below:</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
Landslide, soil erosion or sedimentation	Yes	Minor	Negative	Temporary	<ul style="list-style-type: none"> <li>- Erosion of Quang Loc reservoirs' slopes</li> <li>- Soil erosion caused by the excavation of canal bed and slopes along new canals in Quang Loc and Dak Sin irrigation systems</li> <li>- Erosion of reservoirs bank where weir, spillway to be constructed</li> <li>- Erosion of banks of aqueduct built to cross over these dams;</li> <li>- Landslide at borrow pit areas in Dao Nghia commune</li> </ul> <p><b><u>Affected objects</u></b></p> <ul style="list-style-type: none"> <li>- Water quality on Quang Loc reservoir in Dao Nghia commune &amp; irrigation canals in Dao Nghia &amp; Dak Sin communes.</li> <li>- Cultivation areas which irrigated by subproject canals &amp; Quang Loc reservoir and/or located close to the borrow pit area in Dao Nghia commune.</li> <li>- Beneficiaries on the irrigated areas by water from subproject works;</li> <li>- Gardens of 02 HHs living next to Dao Nghia CPC/ borrow pit.</li> </ul> <p><b><u>Affected level:</u></b> This impact is minor, due to i) the embankment soil is mainly taken from licensed borrow pit near Dao Nghia CPC, distanced from sites (about 500 m - 5 km), where soil cannot slide to water flow; ii) volumes of excavation and embankment are relatively small and scattered along roads &amp; canal in Dao Nghia &amp; Dak Sin communes; iii) excavation will be mainly taken during dry season and iv) areas which located close to borrow pit have 02 HHs. However, these impacts still need to be properly managed and controlled to reduce surface water pollution.</p> <p><b><u>Location:</u></b> In slope areas of upgraded roads, weir, spillway and canals bed and other works in Dao Nghia, Dak Sin</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					communes. Borrow pit in Dao Nghia commune and surrounding areas. <b>Time:</b> Temporary during the construction phase
Polluted surface water	Yes	Minor	Negative	Temporary	<p><b>Description:</b> Surface water on Da R'Keh spring, Cau Tu &amp; Quang Loc reservoirs, and other small streams surrounding the subproject area could be polluted due to construction activities. The main sources of pollution include (i) washing construction materials; (ii) domestic wastewater from 02 worker camps; (iii) grease from construction machine maintenance and (iv) rainwater runoff passing through constructional areas/activities during rainy days.</p> <p>If such pollutants falling/flowing into water bodies could result in water pollution, which reduces water quality for irrigation, domestic use (which is quite limit currently) as well as impact on aquatic-ecology in sub-project area.</p> <p><b>Affected objects:</b></p> <ul style="list-style-type: none"> <li>- Water in Da R'keh spring, Cau Tu reservoir, Quang Loc reservoir, Dak Sin, Dao Nghia commune's canals;</li> <li>- Surrounding small streams nearby sub-project area in Dao Nghia &amp; Dak Sin commune;</li> </ul> <p><b>Affected level:</b> The impact level is minor due to i) the construction activities will be scattered in the larger areas, 2 camps will be located at difference place with small workers will be mobilised on the site (estimated 100 at maximum); ii) excavation will be taken section by section and iii) generations of domestic waste-water (less than 10 m<sup>3</sup>/day), grease and engines' oil are limited; iv) upgrading canals, weirs, spillways will be implemented by diverted flow method which could help to reduce sedimentation in the water. However, appropriate mitigations need to be</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<p>implemented and monitored to minimized impacts.</p> <p><b>Location:</b> Dak Ke'h spring, water surface in Cau Tu&amp; Quang Loc reservoirs in Dao Nghia commune; other small streams and irrigation canals in downstream of those works.</p> <p><b>Time:</b> Temporary during the construction phase</p>
Noise and vibration	Yes	Minor	Negative	Temporary	<p><b>Description:</b> Upgrading Quang Loc, Dak Sin irrigation systems and upgrading roads by using machineries (concrete mixer, bulldozers compressors, trucks etc.) will cause noise &amp; vibration, which may affect residential areas along the upgraded roads, nearby Quang Loc weir and irrigation canals as well as along material transporting routes. In addition, the exploitation &amp; disposal of soil as well as construction waste in borrow pit and disposal site will create noise and vibrations.</p> <p><b>Affected objects:</b></p> <ul style="list-style-type: none"> <li>- Resident areas closed to construction sites in Dao Nghia and Dak Sin communes,</li> <li>- Resident areas along the material transportation roads and upgraded roads.</li> <li>- Resident areas closed to borrow pit and disposal site in Dao Nghia commune.</li> </ul> <p><b>Affected level:</b> This impact is minor due to: i) very few equipment will be mobilized on the site; ii) borrow pit and disposal site are located in vacant land and few households located close to disposal areas/borrow pit; iii) density of households around construction sites is low. The most significant impact is in Quang Loc dam &amp; borrow pit in Dao Nghia commune.</p> <p><b>Location:</b> Residential areas in connecting roads with Dak Sin &amp; Dao Nghia</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					communes; borrow pit in Dao Nghia commune, Quang Loc irrigation works & irrigation works systems in Dak Sin commune.  <b>Time:</b> Temporary during the construction phase.
Air pollution (dust and gas emission)	Yes	Moderate	Negative	Temporary	<p><b>Description:</b> Dust, air pollutants will be generated from excavation activities, waste disposal activities, electrical generators, mobile concrete mixers or operation of trucks, material storage areas. However, the main air pollutants such as NO<sub>x</sub>, SO<sub>2</sub>, CO<sub>2</sub>, etc. will be minor since the number of construction equipment mobilized on the site will be small &amp; distributed in various construction sites, borrow pits. In addition, the construction sites of irrigation canals are well separated from the residential areas. Therefore, the main issue is dust which will be released from excavated surface (since excavation activities will be implemented during dry season) and generated from operation of trucks which need to appropriate manage to reduce impacts on local people.</p> <p><b>Affected objects</b></p> <ul style="list-style-type: none"> <li>- Resident areas closed to works in Dao Nghia and Dak Sin communes, borrow pit in Dao Nghia commune.</li> <li>- Resident areas along the material transportation routes &amp; upgraded roads.</li> </ul> <p><b>Affected level:</b> This impact is considered as moderate due to i) excavation activities schedule to be implemented during dry season; ii) very few equipment will be mobilized the construction sites; iii) few household located closed to borrow pit and disposal areas; iv) very few households located along the updated canals and v) subproject areas are located in rural areas where have many opened space for pollutants to dilute.</p> <p><b>Location:</b> Residential areas in connecting</p>



Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					roads with Dak Sin & Dao Nghia communes; borrow pit in Dao Nghia commune, Quang Loc irrigation works & irrigation works systems in Dak Sin commune.  <b>Time:</b> Temporary during the construction phase.
Solid waste and hazardous waste generation	Yes	Minor	Negative	Temporary	<p><b>Description:</b> Solid wastes, generated in the construction phase, include</p> <p>i) Domestic waste from daily activities of workers, which is mainly rubbish and organic matters. It is estimated that approximate 10.8 tons of domestic waste will be generated during the whole construction period (12 months).</p> <p>ii) Construction wastes, including abundant &amp; discarded soil, sand, stone, debris, steel etc., which are estimated about 15000 m<sup>3</sup> and will be transported to disposal site in Dao Nghia commune. Generation of solid wastes could potential pollute soil, surface water and even causes diseases (by rubbish for construction workers if they are not properly handled and disposed).</p> <p>iii) Hazardous wastes, such as lubricating oil, chemical mops/duster cloth, fuel and chemical containers, are generated by maintenance activities or use of hazardous material. If these wastes are not properly managed they could cause effect on water and soil quality.</p> <p><b>Affected objects:</b></p> <ul style="list-style-type: none"> <li>- Air quality in and around 02 worker camps and disposal site in Dao Nghia commune</li> <li>- Water quality of water bodies nearby 02 worker camps as well as local productive fields nearby construction sites</li> <li>- Workers living in the camps</li> <li>- Roads users on the transport route of subproject.</li> </ul>



Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<p><b>Affected level:</b> This impact should be minor due to: i) waste will be generated for whole construction phase; ii) worker camps will be separated in two differences (only 100 people in two camps); iii) locations disposal areas are far from residential areas; iv) subproject located close to mountain communes which have high absorption ability of environment; and iv) demand of hazardous material used on the site also very limited.</p> <p><b>Location:</b> All sub-project construction and 02 camp sites in Dao Nghia &amp; Dak Sin communes and disposal site in Dao Nghia commune.</p> <p><b>Time:</b> Temporary during construction phase</p>
Soil pollution	Yes	Minor	Negative	Temporary	<p><b>Description:</b> Soil conditions in the subproject area could be affected by (i) domestic wastewater from 02 worker camps; (ii) grease drops from construction machine maintenance and (iii) domestic and construction wastes (solid wastes). If those wastes are not collected and treated in proper manners, these can contaminate soil. Moreover, soil can also be negatively affected by scattering materials and reinforced dropped concrete from construction sites. Soil quality degradation could cause negative impacts on agricultural productivity of local people.</p> <p><b>Affected objects</b></p> <ul style="list-style-type: none"> <li>- Soil condition of cultivated land along upgraded works, borrow pit, disposal site in Dao Nghia commune, in construction sites and in 2 worker camps;</li> <li>- Local peoples in the beneficiary area in Dao Nghia &amp; Dak Sin communes</li> </ul> <p><b>Affected level:</b> This impact is minor due to i) the total number of workers is limited to 100, scattered in 02 worker camps and amount of wastewater generated is</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<p>estimated at approximately 10 m<sup>3</sup> per day; ii) the hazardous substance usage and waste are very minor since the demand of these substance is quite low. However, still need to be managed appropriately as requested in the waste management section.</p> <p><b>Location:</b> 02 worker camps, embankment sites in irrigation works systems of Quang Loc and Dak Sin canal, disposal site &amp; borrow pit in Dao Nghia commune; upgraded roads in Dao Nghia, Dak Sin communes</p> <p><b>Time:</b> Temporary during the construction phase</p>
Local flooding	Yes	Minor	Negative	Temporary /Permanent	<p><b>Description:</b> Constructing concrete irrigation works or roads may block local water flows in rainy seasons and generate local flooding. 07 culverts on upgraded roads will be replaced, design may be inappropriate or contractor will not fully follow technical specifications, which could lead to inadequate discharged aperture of these culverts or temporary lock. Moreover, others culverts and intakes could also be blocked due to equipment, materials and construction wastes placed on. Temporary block of drainage culverts and intakes may cause temporary and locally flooding and if it occurs for long period crops of local people and access roads could be damaged.</p> <p><b>Affected objects:</b></p> <ul style="list-style-type: none"> <li>- Crops of local peoples that irrigated by subproject works and access roads of local people in sub-project areas</li> <li>- Local peoples in the beneficiary area</li> </ul> <p><b>Affected level:</b> This impact is minor due to i) flow diverted method will be applied to ensure water flow in the existing canals during construction phase; ii) excavation activities will be planned to implement during dry period; iii) intervention will be</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<p>conducted section by section and iv) very small adjustment will be implemented in the existing drainage system and almost functions will be remained that ensure its functions during construction phase; and v) finally, design of upgrading irrigation canal systems will be contributed in drainage function of watershed</p> <p><b>Location:</b> Upgraded roads and irrigation works in Dak Sin and Dao Nghia communes and cultivation areas along canals</p> <p><b>Time:</b> Temporary during the construction phase, however it can be permanent if it comes from design errors.</p>
Unsafe for travelling and business during the road construction (Traffic safety)	Yes	Moderate	Negative	Temporary	<p><b>Description:</b> The upgraded 05 transportation roads and constructed roads on dam crest of Quang Loc dam are taken place on existing transportation alignments that are connecting local residential areas with production fields. These construction work may cause encroachment of existing road surface, operation of equipment and trucks, storage of materials may cause disturbance for local travel and unsafe condition for local people. Upgraded roads are communal roads connecting with provincial road TL685, which are main accessing roads to Dao Nghia and Dak Sin communes. The unsafe condition could be listed as(i) traffic accidents, especially the elderly and children and cattle; (ii) the difficulties of movement of goods through the upgraded roads.</p> <p>In addition, it is observed that the transport routes from construction sites to borrow pit and disposal area in Dao Nghia commune are narrow and low grade, thus operation of trucks on the rural roads could potentially impact on local traffic safety in Dao Nghia and Dak Sin communes.</p> <p><b>Affected objects:</b> Local peoples in the subproject area &amp; peoples traveling</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<p>through upgraded and construction roads, dam sites</p> <p><b>Affected level:</b> This impact is moderate due to i) upgrading of roads and canals will be to occupied exiting road surface, which may cause temporary block of access routes; ii) routes from construction sites to borrow pit and disposal area are narrow and low quality; iii) the road construction method is completing section by section with warning signs and informed schedule for local residents; iv) the traffic density on those roads are quite small. However, adequate traffic management need to be implemented to ensure traffic movement and safety for local people.</p> <p><b>Location:</b> Along the constructed roads and on dam crest; communities using such constructed roads and dam crest for travelling in Dak Sin, Dao Nghia communes.</p> <p><b>Time:</b> Temporary during the construction phase</p>
Impacts on ecology	Yes	Minor	Negative	Temporary	<p><b>Description:</b> The sub-project does not include natural reserves, national parks (the nearest natural reserved area is Nam Cat Tien national park distance 5 – 10 km from sub-project area) and ecology with high value in terms of science and reservation, which need to be protected. Therefore, it does not significantly effect on ecology. The areas of borrow pit and disposal site in Dao Nghia commune is public and vacant land, in which only small shrubs are growing. Thus, the exploitation of soil from such borrow pit will not have any noticeable negative impact on land or nearby plantations.</p> <p>In addition, the construction taken place on existing irrigation works could affect on water eco-system nearby, such as Da Re'h spring and Quang Loc dam.</p> <p><b>Affected objects:</b></p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<ul style="list-style-type: none"> <li>- Vegetation covers within the irrigation works system, upgraded roads, borrow pit &amp; disposal site in Dao Nghia commune</li> <li>- Aquatic flora &amp; fauna in Da R'Keh spring, Quang Loc reservoir, water bodies in Dak Sin, Dao Nghia communes</li> </ul> <p><b>Affected level:</b> This impact is minor. According to site observation on April 2015 &amp; June 2016 (i) the areas of borrow pit and disposal site in Quang Loc are vacant land with small shrubs, and sub-project does not acquire those land. And (ii) areas along spring and dam are small shrubs, while aqua-species are almost small fresh fishes, which are less economic and ecological values.</p> <p><b>Location:</b> Along 05 upgraded roads, borrow pit and disposal site in Dao Nghia commune, and irrigation works system of Quang Loc of Dao Nghia &amp; Dak Sin Communes</p> <p><b>Time:</b> Temporary during site clearance and construction</p>
Impact/ damage on infrastructures	Yes	Minor	Negative	Temporary	<p><b>Description:</b> According to the field survey and discussions with local authorities, the existing communal roads, built by local residents, including concrete and soil, but they almost were deteriorated, damaged and difficult for travel. The roads are narrow (3 – 5 m) and the road load is less than 5 tons. Moreover, neighbouring roads/ bridges connecting to the sub-project roads has small load too. So, unless the weight of loaded vehicles transporting materials to and from work sites are scrupulously checked and appropriately limited to specifications, the roads and bridges may be damaged.</p> <p><b>Affected object:</b></p> <ul style="list-style-type: none"> <li>- Road infrastructures utilized by the sub-</li> </ul>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<p>project</p> <ul style="list-style-type: none"> <li>- Local people in the sub-project areas</li> <li>- People travelling along roads, which used for sub-project's transportation</li> </ul> <p><b>Affected level:</b> This impact is minor due to the extent of transportation that needs for sub-project is small and scattered in communes of Dao Nghia &amp; Dak Sin. In addition, there is no infrastructure for water supply system and/or drainage system found in the sub-project areas, therefore these functions will not be impacted. Moreover, construction contractor need to well prepare construction and transportation plan to minimize possible negative impacts, the contractor should also be bound to repair damaged infrastructure to their original condition if this situation will occur.</p> <p><b>Location:</b> All roads/sluices or bridges around the sub-project areas of Dao Nghia and Dak Sin communes</p> <p><b>Time:</b> Temporary during construction phase</p>
Social disturbance by worker gathering	Yes	Minor	Positive & Negative	Temporary	<p><b>Description:</b></p> <p><i>Negative impacts:</i> included: i) diseases such as sore eyes, cholera, flu and other respiratory diseases from workers and spread to local people in the subproject area; ii) social problems can appear such as gambling, drug addiction, prostitution, violence, conflict amongst workers, or among workers and local people. There is also a risk of sexually transmitted diseases (STD) from 100 workers, including HIV/AIDS that needs to be considered.</p> <p><i>Positive impacts:</i> an increase of labor force in commune could temporarily induce some positive economic support for local trading market.</p> <p><b>Affected object:</b></p> <ul style="list-style-type: none"> <li>- Workers on the sites</li> </ul>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<ul style="list-style-type: none"> <li>- People in communes of Dao Nghia, Dak Sin</li> <li>- Business in Dao Nghia &amp; Dak Sin communes</li> </ul> <p><b>Affected level:</b> Both positive and negative impacts are minor due to i) the workers will be split in 02 camps in 02 communes of Dao Nghia and Dak Sin; ii) workers will be encouraged to mobilize on the site; iii) construction schedule is just only 12 months and iv) finally, workers need to be managed and controlled to eliminate negative impacts.</p> <p><b>Location:</b> Sub-project areas and 02 worker camps in Dak Sin and Dao Nghia communes</p> <p><b>Time:</b> Temporary during construction phase</p>
Impacts on health of local people and construction workers	Yes	Moderate	Negative	Temporary	<p><b>Description:</b> During the construction phase, dust and noise generated by construction activities, operation of equipment (such as concrete mixers, bulldozers, compressors) and transport vehicles may cause direct health effect on workers and local communities, especially in case of safety and regulation not being properly complied with.</p> <p>The high risks of health problem and safety for workers may also come from unsafe living condition, unsafe food, water supply, inappropriate personnel protection equipment (PPE), conflict between workers, and road vehicles or traffic accidents involving people passing through construction places.</p> <p>Moreover, the construction activities may need to occupy road surface or add a number of vehicles on the rural narrow roads, which could lead to unsafe for local people who use the roads. The construction of roads may also cause temporary block access road of local people.</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<p><b><u>Affected objects</u></b></p> <ul style="list-style-type: none"> <li>- Workers in the construction sites</li> <li>- Residential areas along the transport route in Dao Nghia, Dak Sin communes and near the works construction area</li> <li>- Residential areas along 05 upgraded roads</li> </ul> <p><b><u>Affected level:</u></b> This impact is at moderate level, due to i) a number of construction workers (maximum 100 workers) as well as machine and equipment will be mobilized on the sites; ii) upgrading roads will need to occupy the existing road surface; iii) there will be also temporary encroached the roads &amp; canal banks to storage of material; iv) contractors will need to use narrow road for transport waste and material. However, road and canal upgrading will be constructed section by section which will help to reduce intervention on existing ones. The number of equipment will be very limited. Larger volume of excavated soil will be reused which could help to reduce demand of transport. Nevertheless, the importance of preserving human health and lives, including worker and local resident, adequate management measures need to be implemented and supervised.</p> <p><b><u>Location:</u></b> Construction sites, upgraded works of Dao Nghia &amp; Dak Sin communes and 02 worker camps of sub-project</p> <p><b><u>Time:</u></b> Temporary during construction phase</p>
					<p><b><u>Description:</u></b> According to the report from Dak Nong PPMU, the embanked soil of the sub-project will be taken from the borrow pit, where is behind Dao Nghia People Committee Office. This borrow pit is enough for whole project (capacity is 50,000 m<sup>3</sup> while the demand is 25,000 m<sup>3</sup>) and distances 500 m to Quang Loc dam, 2</p>



Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
Impacts around the borrow pit, mines of stone and sand	Yes	Minor	Negative	Temporary	<p>km to Quang Loc canal, and 5 km to Dak Sin construction sites.</p> <p>However, the exploitation of soil and transportation of materials will emit dust and gas pollutants that disturb local people and workers, especially this borrow pit in Dao Nghia CPC is in residential area.</p> <p>Other materials will be purchased in town centers and licensed mines; thus, only impact of transporting materials is considered.</p> <p><b><u>Affected objects</u></b></p> <ul style="list-style-type: none"> <li>- Local residents along transportation roads</li> <li>- Workers and local residents living around borrow pit in Dao Nghia commune;</li> </ul> <p><b><u>Affected level:</u></b> This impact is minor due to i) the borrow pit are located close to construction site, thus reduce distance for transporting and only several households living nearby borrow pit, which reduce exposure subjects. ii) total demand of embankment soil will be very few (25,000 m<sup>3</sup> of soil for the whole project). And iii) other materials will be purchased from licensed and controlled mines by authorities via environmental in Dak Nong province.</p> <p><b><u>Location:</u></b> Areas around borrow pit in Dao Nghia commune, and areas along the transport routes</p> <p><b><u>Time:</u></b> Temporary during construction phase</p>
					<p><b><u>Description:</u></b> The construction will take place on existing Quang Loc dam, which is serving for 173 ha ha of wet rice, coffee, pepper and cash crops in Dao Nghia and Dak Sin commune. The upgrade of dam and construction of irrigation canals could temporarily stop irrigation functions. Specifically, constructions of Quang Loc</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
Impact on existing irrigation systems	Yes	Minor	Negative	Temporary	<p>weir and irrigation canals require blocking constructed sections. Therefore, during construction and stabilization periods, the irrigation functions could be temporarily affected, which could have potentially negative impacts on crops if mitigation measures are not implemented properly.</p> <p><b><u>Affected objects :</u></b></p> <ul style="list-style-type: none"> <li>- Crops of local people irrigated from the sub-project irrigation works, especially downstream of Quang Loc dam</li> <li>- Local people in the beneficiary areas in Dao Nghia &amp; Dak Sin communes;</li> </ul> <p><b><u>Affected level:</u></b> The impact is moderate due to i) the construction of weir and canals will be implemented in subsequent sections with diversion flow methods to ensure irrigation water supply for cultivation activities; ii) the total affected period on irrigation system is only 12 months during the construction period. However, mitigation measures during construction need to be strictly implemented to reduce impacts on crops of local people.</p> <p><b><u>Location:</u></b> Quang Loc dam and irrigation works in Dao Nghia and Dak Sin communes</p> <p><b><u>Time:</u></b> Temporary during construction phases</p>
Impact on surrounding agricultural land and cultivation activities	Yes	Minor	Negative	Temporary	<p><b><u>Description:</u></b> The construction activities of the sub-project could affect surrounding agricultural activities of local people such as (i) temporarily blocking irrigation water towards downstream areas; (ii) causing temporarily problems to local transportation of materials and products to productive areas; and (iii) falling of materials in the canals of the surrounding areas.</p> <p><b><u>Affected objects:</u></b></p> <ul style="list-style-type: none"> <li>- Local people depending on water</li> </ul>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<p>supply from Quang Loc dam and its irrigation system for their cultivating activities</p> <ul style="list-style-type: none"> <li>- Local people accessing production areas by to be upgraded roads</li> </ul> <p><b>Affected level:</b> This impact on surrounding areas is minor due to (i) the extent of construction activities is small and scattered in Dao Nghia &amp; Dak Sin communes, and (ii) the main travelling time to productive areas of local people are in early morning or late afternoon, which are different with construction time. This will reduce difficulties in travelling and transferring materials and/or goods. (iii) the construction of canals will be completed by subsequent sections to ensure/ minimize impact on the function of irrigation works/canals.</p> <p><b>Location:</b> Areas surrounding Quang Loc dam and agricultural areas in Dao Nghia and Dak Sin communes</p> <p><b>Time:</b> Temporary during construction phases</p>
Cultural objects or graves found	No				<p><b>Description:</b> Currently, there is no any cultural object or grave found in sub-project areas. Therefore, the construction will not impact on those subjects. However, during construction phase, if there is any cultural object and/or grave found, the contractor is compelled to immediately suspend works in that area and notify the State Agency responsible for culture, sports and tourism for prompt action/measures.</p> <p><b>Affected objects:</b> Potential cultural objects/graves within construction areas (borrow pit, upgraded roads and canals).</p> <p><b>Affected level:</b> Currently there is no impact, but if any impact occurs, it would be minor.</p> <p><b>Location:</b> Construction areas and borrow pit in Dao Nghia and Dak Sin communes</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<b>Time:</b> Temporary during construction phases
Environmental recovery activities	Yes	Minor	Negative & Positive	Both Temporary & Permanent	<p><b>Description:</b> Construction contractor needs to recover damaged environment and public infrastructures to its original condition. If environmental recovery activities are not properly implemented, natural environment and local infrastructures could be suffered from (i) loss of trees along roads and loss of trees and vegetation around upgraded irrigation works and borrow pit; (ii) changing environmental landscape at borrow pit and disposal site in Dao Nghia commune; (iii) changing aqua-conditions for aqua-species in Quan Loc dam &amp; canals. And (iv) downgrade of existing public infrastructures.</p> <p>Moreover, restoring the original environmental conditions of damaged features may also have some positive impacts. These impacts may include strengthening road surface, which could result in longer use and become better in terms of safety for local people as well as increasing green space in recovered areas.</p> <p><b>Affected objects:</b></p> <ul style="list-style-type: none"> <li>- Local infrastructures used by the subproject</li> <li>- Local people in the subproject area &amp; peoples traveling through the roads that need to be recovered;</li> <li>- Landscape around reservoir area, along to be upgraded roads, new canal areas, borrow pit and disposal sites in Dao Nghia, Dak Sin communes.</li> </ul> <p><b>Affected level:</b> This impact is minor entity, due to: i) subproject will upgrade existing works and road; ii) very few number of trees need to be cut out, and they are not listed in rare species needing special preservation; iii) there will be not many</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<p>local infrastructures that need to be restored; iv) borrow pit will be changed land use status right after subproject completed.</p> <p><b>Location:</b> Quang Loc dam, new canals, construction areas, along upgraded roads in Dao Nghia, Dak Sin communes</p> <p><b>Time:</b> Temporary during construction phases</p>
<b>III Operational phase</b>					
Drainage trenches, culverts, canals obstructing or flooding because of not on time dredging	Yes	Minor	Negative	Temporary	<p><b>Description:</b> Culverts, trenches and canals are likely to be obstructed by flowing rainwater that sweeps soil, sand and stones while dredging is untimely. This will cause water logging and temporarily inundation in several low-lying places.</p> <p><b>Affected objects:</b></p> <ul style="list-style-type: none"> <li>- Local peoples living along upgraded irrigation works</li> <li>- Field along upgraded irrigation works</li> </ul> <p><b>Affected level:</b> This impact is minor due to maintenance activities include culverts dredging that will be implemented regularly by The Center of Exploitation and Protection Irrigation Works of Dak Nong.</p> <p><b>Location:</b> Along culverts, canals, and trenches on downstream face of dams in Dao Nghia, Dak Sin communes.</p> <p><b>Time:</b> During the operational phase</p>
Erosion or land side	Yes	Minor	Negative	Temporary	<p><b>Description:</b> High intensity rain can cause landslide, erosion and sedimentation in nearby canals and culverts, and obstruct them especially during heavy rain. The impact will be reduced when soil of the road is stabilized and vegetation is fully grown on both sides of the road, canals.</p> <p><b>Affected objects:</b></p> <ul style="list-style-type: none"> <li>- Local peoples in the subproject area in communes of Dao Nghia, Dak Sin</li> </ul>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<p>- Water quality and aqua-species in Quang Loc reservoir &amp; irrigation canals</p> <p><b>Affected level:</b> This impact is minor and stabilized soon when vegetation grown in slope of dam, roads and banks of canals.</p> <p><b>Location:</b> Along trenches, banks of dam, culverts and roads</p> <p><b>Time:</b> During the operational phase with less impact after soil is compacted and vegetation is fully-grown.</p>
More traffic accidents	Yes	Minor	Negative	Permanent	<p><b>Description:</b> After upgrading the roads, the surface of the roads is in good condition, the traffic density and driving speed are increasing (particularly among young drivers). This is likely to cause traffic accidents if road users do not abide to traffic regulations.</p> <p><b>Affected objects:</b> Local people in the subproject area &amp; peoples traveling through the upgraded roads and road on dam crest</p> <p><b>Affected level:</b> This impact is minor due to the density of transportation in this area is still at low level.</p> <p><b>Location:</b> Along the upgraded road and on dam crest in Dao Nghia communes</p> <p><b>Time:</b> After construction completion, during operational phase</p>
Impact on water quality due to increase of fertilizer or pesticide volume	Yes	Minor	Negative	Permanent	<p><b>Description:</b> The increasing irrigation volume from upgraded irrigation works systems could potentially increase production. However, the use of fertilizer and/or pesticide will also normally increase and this will have an effect on both surface and ground water in sub-project area as well as in the water of downstream-irrigated fields.</p> <p><b>Affected objects:</b> Reservoir, canal water quality in the subproject area &amp; water bodies closed to the cultivated area irrigated by the subproject</p>

Impacts	Potential Impact				Brief description
	Yes / no	Minor or significant	Positive or negative	Temporary or permanent	
					<p><b>Affected level:</b> The impact is predicted as minor because the increase of fertilizer and pesticide is small amount; and the trend of using environmental-friendly products in future.</p> <p><b>Location:</b> Quang Loc reservoir, new constructed canals and the downstream canals, and beneficiary area of Dao Nghia and Dak Sin communes</p> <p><b>Time:</b> Long term in operational phase</p>
Dams break during operation	Yes	Moderate	Negative	Permanent	<p><b>Description:</b> According to Dak Nong PPMU report, Quang Loc dam had been built by local people since 1995 and operated for many years. Although there is no emergency by now, the dam is in degrading. Therefore, upgrading Quang Loc dam will bring positive impact for controlling water, and reduce possibility of dam break. In addition, the hydro-meteorological are updated and integrate into the technical design to reduce risks.</p> <p>However, during operation, some impacts from natural disasters such as weather, storms, and floods may still cause dam break. This may cause losses of life and property or destroy crops and property of the people at downstream of the dams.</p> <p><b>Affected objects:</b> Local peoples in downstream of Quang Loc dam of Dao Nghia Commune;</p> <p><b>Affected level:</b> Because magnitude of consequences, this potential impacts is moderate and needs to be monitored and responded on time.</p> <p><b>Location:</b> Quang Loc dam in Dao Nghia commune.</p> <p><b>Time:</b> Long term in operational phase.</p>

## VI. ENVIRONMENTAL MANAGEMENT PLAN

From the analysis and evaluation of environmental impacts in section V, this section below outlines the environmental management plan (EMP), including (i) Environmental mitigation measures; (ii) Environmental monitoring; (iii) Capacity strengthening program

### 6.1 Environmental impacts and mitigation measures

**Table 4: Environmental mitigation plan**

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
	Pre-construction phase						
1	Impacts on HHs due to site clearance (land acquisition)	Minimize social impacts to households along the sub-project sites	<ul style="list-style-type: none"><li>- This sub-project will not have resettlement and compensation plan, all affected household agreed to donate their land, thus only Land Acquisition Completion Report (LACR) is implemented. However, to minimize social impact, the design period need to consider using existing alignments of sub-project components.</li><li>- Implement mitigation measures as proposed in LACR of sub-project.</li><li>- Dak Nong PPMU have to conduct public consultation to inform potential impact of land acquisition</li></ul>	PPMU of Dak Nong	Village No.1 & No.2 of Dak Sin commune and Quang Loc village of Dao Nghia commune  Productive land of 211 HHs along the roads, close to reservoirs in Village No.1 & No.2 of Dak Sin commune and Quang Loc village of Dao Nghia commune	Before construction activities	Cost of sub-project preparation by PPMU of Dak Nong



No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			<p>to local people.</p> <ul style="list-style-type: none"> <li>- Land donation and assets on land must be done based on voluntariness of HHs through meaning fully public consultation.</li> </ul>				
2	Reducing crop productive due to inappropriate construction plan	To ensure that the sub-project does not interrupt or negatively affect farming activities	<ul style="list-style-type: none"> <li>- Constructional plan needs to be displayed and discussed with DARD of Dak Nong and Dak Rlap, local authority/people and the results displayed publicly on notice boards of Dao Nghia, Dak Sin communes.</li> <li>- Flow diversion method and temporary coffer-dam for head-works &amp; canals construction will be applied during constructing and upgrading Quang Loc weir and irrigation canals, during construction phase.</li> <li>- Construct by section in road component to remain transportation function of road during construction period.</li> <li>- The material's supplying plan needs</li> </ul>	Construction contractors and PPMU of Dak Nong	Beneficiaries areas are irrigated by water from these irrigation systems and upgraded roads in Dao Nghia & Dak Sin communes	Detail design and construction phases	Cost of sub-project preparation by PPMU of Dak Nong

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			<p>to be prepared and the following requirements should be included:</p> <ul style="list-style-type: none"> <li>▪ Required materials, potential sources and estimated quantities available.</li> <li>▪ Material supply provenience: preference in purchase from existing quarries</li> <li>▪ Agreement with the local authorities on above items</li> <li>▪ Check with environmental permission/certification of the quarries to ensure that environmental impacts and mitigation measures have been considered by the owners.</li> <li>▪ Material transportation will be done following suitable plans and schedules.</li> </ul>				
<b>II</b>	<b>Construction phase</b>						

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
1	Landslide, Soil erosion and increase of sedimentation in flowing water into irrigation canals	Minimize soil erosion and increase of sedimentation in flowing water caused by erosion	<ul style="list-style-type: none"> <li>- Excavation works need to be scheduled to exclude rainy season (from end of May or early June to November) as much as possible.</li> <li>- Split construction section by section to reduce the concentration of materials and extent of excavation and/or embankment.</li> <li>- Material storage areas need to be bounded and covered during rainy times.</li> <li>- Stabilize all slopes, embankments and other erosion-prone working areas while works are proceeding at borrow pit and disposal site.</li> <li>- Re-plant vegetation covering upper parts of slope sections of roads and of weir as soon as possible after excavation and/or embankment works are achieved.</li> <li>- The exploitation of borrow pit need to avoid rainy days that may cause land sliding.</li> <li>- The exploitation of borrow pit need</li> </ul>	Contractors	In slope areas of upgraded roads, weir, spillway and canals bed in Dao Nghia, Dak Sin communes and surrounding areas.	During the construction phase	Included in the construction contract

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			<p>to be dug in subsequent sections to be better control vertically of digging areas.</p> <ul style="list-style-type: none"> <li>- Not allow heavy machinery or other equipment to be located on the top of digging areas of borrow pit to avoid possible landslide.</li> </ul>				
2	Surface water source can be contaminated	Minimize water source contamination	<ul style="list-style-type: none"> <li>- Discarded lubricants and/or other chemicals have to be kept in dry covered area.</li> <li>- Discarded lubricants/ chemicals from construction sites need to be collected, transported and treated according to the Circular No. 36/2015-BTNMT of MONRE.</li> <li>- Construction waste &amp; discarded soil needs to be transported by adequate manners to agreed disposal site in Dao Nghia commune.</li> <li>- Provide 04 dustbins and 02 mobile septic tanks at work sites to manage wastewater and domestic waste from workers at 02 camps</li> </ul>	Contractors	Dak Ke'h spring, water surface in Cau Tu & Quang Loc reservoirs in Dao Nghia commune; other small streams and irrigation canals in downstream of	During the construction phase	Included in the construction contract

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			<p>site.</p> <ul style="list-style-type: none"> <li>- Disposal of solid wastes into canals, streams, other watercourses and agricultural fields shall be prohibited through notices in signboards at sites and be enforced by daily patrols by contractors' personnel in all sites.</li> <li>- Contractors must prepare a place to clean/wash tools/vehicles. Washing trucks/vehicles next to water bodies, existing streams such as Dak Ke'h spring, Cau Tu &amp; Quang Loc reservoirs in Dao Nghia commune as well as other surface water bodies nearby will not be permitted.</li> <li>- Locations of 02 worker camps need to be apart from Cau Tu &amp; Quang Loc reservoirs &amp; irrigation canals to avoid water contaminations from domestic waste.</li> <li>- Cover material storage areas if it rains. Temporary storage of constructional and domestic waste</li> </ul>		those works		

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			on the sites should not last more than 24 hours.				
3	Noise/ vibration	Ensure noise/vibration at standard QCVN 26 & 27:2010/BTNMT	<ul style="list-style-type: none"> <li>- Construction machines and equipment need to meet standards of noise and vibration as regulated by the Government. The Contractor needs to submit the official documents proving that all construction vehicles, equipment, and machines are checked and meet requirements of the current Vietnam standards concerning noise and vibration generated.</li> <li>- Ensure all construction vehicles and equipment are well maintained. Turn off machinery and/or equipment when possible to avoid continuous noise and vibration impacts on workers.</li> <li>- All noise and vibration generating activities shall be avoid during resting time of local people (12-1pm and 8pm – 6am) along the upgraded roads, canals and other</li> </ul>	CPMU. LIC, PPMU of Dak Nong, contractors	Residential areas in connecting roads with Dak Sin & Dao Nghia communes; borrow pit in Dao Nghia commune, Quang Loc irrigation works & irrigation works systems in Dak Sin commune	During the construction phase	Included in the construction contract

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			<p>works in Dao Nghia &amp; Dak Sin communes.</p> <ul style="list-style-type: none"> <li>- Provide ear protective equipment (ear plug/ear muff) for workers working in high noise conditions generated by machinery and/or equipment and allow for reasonable time-off from work when they are exposed to excessively long periods to noise and vibrations, as required in Decision 3733/2002 of Ministry of Health.</li> <li>- Detailed construction schedule needs to be publicly announced by the contractor to local people (on the notice boards of Dao Nghia &amp; Dak Sin communes) so that they can arrange their activities and stay away from working sites and noise and vibrations.</li> </ul>				
			- Covering trucks and transportation				

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
4	Air pollution caused by machines and vehicles (dust and gas emissions)	To ensure air pollution complied with QCVN:05-2013/BTNMT	<p>vehicles to minimize dust generated when transporting materials and waste.</p> <ul style="list-style-type: none"> <li>- The use of construction materials need to be properly planned to limit as much as possible the volume of quantities stored on the sites.</li> <li>- Watering practices, to minimize dust generation, need to be implemented for roads and working sites, which are close to residential areas, such as Quang Thanh, Quang Tho, Quang Phuoc, Quang Chanh, Quang Loc, Quang An &amp; Quang Dat villages of Dao Nghia commune, and Villages 1, 2, 3, 4, 5, 10 &amp; 13 of Dak Sin commune. The watering activities have been proposed to be carried out at least once per day during rainy season and twice per day during dry season in working areas.</li> <li>- Equipment/vehicles have to be verified and licensed. Specifically, transporting vehicles need to meet</li> </ul>	CPMU. LIC, PPMU of Dak Nong, contractors	Residential areas in connecting roads with Dak Sin & Dao Nghia communes; borrow pit in Dao Nghia commune, Quang Loc irrigation works and irrigation works	During the construction phase	Included in the construction contract



No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			<p>the standards related to exhaust emissions as regulated by Government and according to Decision 249/2005 of the Prime Minister about emission of transportation vehicles in the territory.</p> <ul style="list-style-type: none"> <li>- Equipment and machines will not be allowed to move outside of construction sites to ensure control of emission sources.</li> <li>- Materials or soil are falling on the paved roads and public roads shall be cleaned immediately.</li> <li>- All material/waste storages shall be located away from any households and sensitive areas.</li> </ul>		systems in Dak Sin commune		
5	Soil contamination	Minimize soil contamination	<ul style="list-style-type: none"> <li>- Cover material storage areas and handle chemicals and wastes to ensure that construction materials and/or wastes could not fall into agricultural land in the subproject areas.</li> <li>- Discarded lubricants and/or</li> </ul>	CPMU. PPMU Nong, contractors  LIC, Dak	02 worker camps, embankment sites in irrigation works systems of Quang	During the construction phase	Included in the construction contract

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			<p>chemicals must be kept in dry and covered area.</p> <ul style="list-style-type: none"> <li>- Toxic/hazardous waste, if any, need to be collected, transported and treated according to Circular No. 36.2015/BTNMT of MONRE.</li> <li>- Regularly collect solid wastes and transport these to disposal site where had agreed with local authorities of Dao Nghia commune. To eliminate diseases and landscape, solid waste need to be dumped and covered by lime and covered by soil layer.</li> <li>- Provide dustbins and mobile septic tanks in all construction sites and worker camps.</li> <li>- Wastewater from worker camps needs to be collected and treated initially by mobile septic tanks before discarded to environment.</li> </ul>		Loc and Dak Sin canal, disposal site & borrow pit in Dao Nghia commune; upgraded roads, in Dao Nghia, Dak Sin communes		
6	Local flooding	To ensure that the construction does not	<ul style="list-style-type: none"> <li>- Setting up appropriate construction schedule to avoid rainy season, especially for excavation activities.</li> </ul>	Contractors	Upgraded roads and	During the construction phase	Included in the construction

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
		interrupt farming activities	<p>This has been strictly applied for excavation, embankment and construction of Quang Loc weir, and irrigation canals.</p> <ul style="list-style-type: none"> <li>- Manage storage of materials and/or wastes to avoid them falling into water flows in irrigation canals as well as blocking intakes and culverts.</li> <li>- Regularly check water flow situation of canals, intakes, culverts and removing materials/waste that block water flow.</li> <li>- Place equipment to wash instruments/ vehicles/ tools next to the spring, streams, existing canals will not allowed such as Dak Ke'h spring, Quang Loc reservoir, irrigation canals of Quang Loc, Dak Sin.</li> </ul>		irrigation works in Dak Sin and Dao Nghia communes and cultivation areas along canals		contract
			<ul style="list-style-type: none"> <li>- Install traffic signals at construction sites to regulate and minimize speed of vehicles or panels warning of areas under construction,</li> </ul>				

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
7	Unsafe for travelling and business during the road construction (Traffic safety)	Ensure traffic safety and minimize life disturbance of local people	<p>especially at the roads' intersections.</p> <ul style="list-style-type: none"> <li>- Install lamps at night at construction sites.</li> <li>- Inform the community about construction schedule through informal public consultation or at any local people meetings and display related information on noticeboards of Dao Nghia and Dak Sin communes.</li> <li>- Construction activities need to be done by section sequences to minimize temporary occupation of areas along the roads.</li> <li>- Train drivers of sub-project as well as worker to work respecting safety rules and warning people passing nearby the construction sites.</li> <li>- Appoint at least 01 worker to be responsible in monitoring the inflow and outflow of vehicles to and from construction sites as well as</li> </ul>	Contractors	Along the constructed roads and on dam crest; communities using such constructed roads and dam crest for travelling in Dak Sin, Dao Nghia communes	During the construction phase	Included in the construction contract

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			warning people to ensure traffic safety.				
8	Impact on local area ecology	Minimize impacts terrestrial ecology	<ul style="list-style-type: none"> <li>- Only cutting down of private trees, vegetation and agricultural plants that has been taken into account in compensation plans.</li> <li>- Any cut plants and/or damaged fields, which are out of ROW, will be compensated according to voluntary agreement.</li> <li>- Re-plant vegetable cover section by section after construction work completed to return landscape in its original condition.</li> </ul>	Contractors, Dak Nong PPMU	Along 05 upgraded roads, borrow pit & disposal site in Dao Nghia commune and irrigation works system of Quang Loc of Dao Nghia Dak Sin Communes	During the construction phase	Included in the construction contract
9	Impact by solid wastes	Minimize impacts to environment by solid wastes	<ul style="list-style-type: none"> <li>- Residual volume of soil (approximate 15,000 m3) will be transferred to disposal site agreed with Dao Nghia CPC commune. In case that local people ask excavated soil for their house, the agreement between local HHs, contractors and local authorities need to be obtained.</li> </ul>	Contractors	All sub-project construction and 02 camp sites in Dao Nghia & Dak Sin communes and disposal site in Dao Nghia commune.	During the construction phase	Included in the construction contract

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			<ul style="list-style-type: none"> <li>- Construction contractor needs to collect solid waste weekly collect solid waste from 02 worker camps with a local solid waste collection agency in Dak Rlap district;</li> <li>- Equip 04 dustbins and 02 mobile septic tanks to work sites for waste collections and treatment.</li> <li>- Disposal of solid wastes into canals, stream, other watercourses, agricultural field and public areas shall be prohibited.</li> <li>- Burning of construction and domestic wastes shall be prohibited.</li> </ul>				
			<ul style="list-style-type: none"> <li>- Work with existing infrastructure owners (electricity, water...) to identify locations of underground components if any.</li> <li>- Obtain agreement with local authorities in using the transport routes.</li> <li>- Any public facilities, which are</li> </ul>				

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
10	Impacts to existing infrastructure	Minimize adverse impacts to existing infrastructures	<p>damaged during sub-project activities, need to be fully repaired and recovered to their original conditions by the contractor.</p> <ul style="list-style-type: none"> <li>- Load capacity of trucks should not exceed local bridges /roads' load design (weight of loaded truck utilized to be lower than 10 tons, depending on the designed load of bridge/road).</li> <li>- After construction completion, all public facilities must be re-checked to ensure their functions not being affected by sub-project activities. If any damage has been identified besides normal wear and tear, contractor will be responsible for repairing the damaged structures to their original conditions and compensate for damages that cannot be recovered.</li> </ul>	Contractors	All roads/sluices or bridges around the sub-project area of Dao Nghia and Dak Sin communes	During the construction phase	Included in the construction contract
			- Recruitment of worker should				



No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
11	Disturbance to local people's life due to crowded workers	To minimize disturbances to local people's life due to workers	<p>prioritize local workers.</p> <ul style="list-style-type: none"> <li>- Register provisional residence for workers temporary living in the 02 camps.</li> <li>- Contractor needs to regulate camp sanitation system.</li> <li>- Carry out HIV/AIDS and sex transmission infection prevention program. All workers should attend the training organized by the Project.</li> <li>- Propagate and raise awareness of the construction workers to maintain discipline, habits and customs and create good relationships with local people, reduce social evils.</li> <li>- Contractors need to be encouraged to organize provision of meals for all workers at each site to ensure hygiene and food safety.</li> <li>- Spray insecticides at 02 worker camps.</li> <li>- Train and guide labor safety</li> </ul>	Contractors	Sub-project areas and 02 worker camps in Dak Sin and Dao Nghia communes	During the construction phase	Included in the construction contract

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			measures and prevention of common diseases for workers.				
			<ul style="list-style-type: none"> <li>- Construction contractor needs to register number of labor working for sub-project to local authority.</li> <li>- Regularly testing workers' health against infectious diseases as regulated by Ministry of Labor.</li> <li>- Provide sufficient labor safety equipment (PPEs) to workers such as safety clothes, shoes, helmets, harness etc. Instruct workers how to use and monitor their regular use to ensure compliance.</li> <li>- A first aid kit will be provided at each construction site to ensure patients can receive first aid timely before transporting them to the medical station/ hospital. Collaborate with Dao Nghia and Dak Sin communes' clinic centers to receive additional support.</li> <li>- Install power network at site in</li> </ul>				

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
12	Risks to health and safety to local people and workers	To ensure good health and safety to local people and workers	<p>accordance with official safety regulations to ensure that power lines are safe and that power connections to grid or generators are located at dry and safe places.</p> <ul style="list-style-type: none"> <li>- Install warning signs at the electric receptacles.</li> <li>- Display information panels about the project, the labor regulations at sites.</li> <li>- Install fences, warning signs at the intersection between the drains/canals and roads.</li> <li>- Keep the light switched on during the night time at all construction sites.</li> <li>- Construct temporary drainage ditches to drain water from the sites, prevent any possible water logging.</li> <li>- Prepare emergency alerts and remedy intervention for any occurrence during construction activities such as fire, flooding or</li> </ul>	Construction contractor	Construction sites, upgraded works of Dao Nghia and Dak Sin communes and 02 worker camps of sub-project	During construction phase	Included in the construction contract

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			other unforeseen events.				
13	Impacts around the borrow pits, mines of, stone and sand	To minimize environmental impacts caused by mining raw materials for construction	<p>- The soil will be excavated from borrow pit in Dao Nghia commune thus no need to transfer in long distance (0.5 – 5 km). During soil excavation, mitigation measures to environment needs to be implemented as following:</p> <ul style="list-style-type: none"> <li>▪ Exploit section by section to avoid excessive dust generation and landslides.</li> <li>▪ Prepare recovery plan for exploited areas.</li> <li>▪ Workers in quarry have to have PPEs and should follow proper safety guidelines.</li> <li>▪ Vehicles' bed need to be covered to avoid dust &amp; solid waste dropping on the roads.</li> </ul>	Dao Nghia CPC, Mines' owners; Construction contractor	Borrow pit in Dao Nghia commune and along the transport routes	In preparing materials for construction phase	Included in the construction contract

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			<ul style="list-style-type: none"> <li>Nighttime transportation need to be minimized to avoid traffic accidents possibly due to poor nighttime visibility, and to avoid noise generated in resting time ro local residents.</li> <li>The stone and sand materials will be purchased from town centers (20 – 40 km) where environmental issues are controlled and mitigated by local authorities and mines' owners. Thus construction contractor need to check license and environmental mitigation measures of such quarries.</li> </ul>				
			<ul style="list-style-type: none"> <li>The construction of irrigation system must be scheduled and planned considering water availability for fields. Those plans need to be agreed with Dak Nong and Dak R'lap DARDs, Dao Nghia and Dak Sin communes and displayed to local residents on noticeboards.</li> </ul>				

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
14	Impact on existing irrigation systems	To avoid and minimize situation of lacking water for irrigation	<ul style="list-style-type: none"> <li>- Contractors need to apply adequate measures to ensure that irrigated fields, nearby and in downstream of Quang Loc dam, will not be deprived of needed water.</li> <li>- The diversion flow method will be applied during upgrading and constructing Quang Loc dam and irrigation canals to ensure water availability for irrigation (Winter – Spring and Summer – Autumn crops) during construction phase.</li> <li>- Construction need to implemented in subsequent section to minimize impacts as whole.</li> </ul>	Construction contractor, Supervisors and Dak Nong PPMU	Quang Loc dam and irrigation works in Dao Nghia and Dak Sin communes	During construction phase	Included in the construction contract
			<ul style="list-style-type: none"> <li>- The construction plans need to be reviewed and agreed with Dak Nong and Dak R'lap DARDs, Dao Nghia and Dak Sin communes and displayed in noticeboards of such communes, especially the withdrawing water plan of Quang Loc reservoir, and blocking canals during</li> </ul>				

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
15	Impact on surrounding agricultural land and cultivation activities	Avoiding and minimizing impacts on surrounding agricultural activities	<p>construction.</p> <ul style="list-style-type: none"> <li>- For road component: Construction should be completed section by section to ensure that local traffic will not be disrupted.</li> <li>- Dam crest of Quang Loc is used as transportation road, thus during construction period, not allow local people using this road and guide locals use bypass road in Village 1 of Dak Sin (distance about 3 km).</li> <li>- For construction of irrigation canals: construction plans need to ensure water supply for irrigated fields. The constructed sections will be blocked in both endings and water will be diverted through these sections by pipes, which will be located in both sides of canals. The order of construction will be from upstream to downstream.</li> <li>- Any negative impact to irrigated fields, occurring during construction period, needs to be adequately compensated.</li> </ul>	Construction contractor	Areas surrounding Quang Loc dam and agricultural areas in Dao Nghia, Dak Sin communes	During construction phase	Included in the construction contract



No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
16	Cultural objects or graves found	Avoiding and minimizing impacts on cultural objects and graves	<ul style="list-style-type: none"> <li>- If any cultural object and/or grave is found during construction, the construction activities at those places need to be temporarily stopped and local authorities should be immediately informed of the findings to deal with the issue.</li> <li>- Proper forms of compensation need to be taken after consultation with affected HHs suffering from any impact on their graves. The construction contractor has to provide necessary support to these HHs to resettle graves elsewhere or to local communes for cultural objects found</li> </ul>	Construction contractor, Dak Nong PPMU, CPCs of Dao Nghia and Dak Sin	Construction areas and borrow pit in Dao Nghia & Dak Sin communes	During construction phase	Included in the construction contract
			<ul style="list-style-type: none"> <li>- During construction, any damage to local infrastructures will be compensated and mitigated by construction contractor as mentioned above.</li> <li>- The environmental issues emerged during recovery activities such as noise, dust, gases, solid waste, hazardous waste, wastewater will</li> </ul>				

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
17	Environmental recovery activities	Ensure damaged environment and related infrastructures will be recovered after completing construction	<p>be handled with similar measures indicated in related sections above.</p> <ul style="list-style-type: none"> <li>- Re-plant cutting plants and trees after completing construction activities.</li> <li>- Repair damaged infrastructures as soon as possible.</li> <li>- Restore water flow into upgraded canals as soon as possible to recover aqua-ecosystem.</li> <li>- Flow water into Quang Loc reservoir and protect areas from fishing activities to recover aqua-ecosystem.</li> <li>- Restore the landscape in and around borrow pit to avoid landslides after exploitation completed;</li> </ul>	Construction contractor	Quang Loc dam, new canal, construction areas, along upgraded roads in Dao Nghia, Dak Sin communes	During and after construction phase	Included in the construction contract
<b>III. Impacts in the operation phase</b>							
				The Dak Rlap			

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
1	Drainage trenches, culverts, canals obstructing or flooding because of not on timely dredging	Ensure drainage function of canals, culverts and trenches	<ul style="list-style-type: none"> <li>- Regularly check and maintain canals, culverts and trenches.</li> <li>- Periodically dredge culverts and trenches after each harvest or after heavy rain that erode hillside.</li> </ul>	Exploitation of Irrigation Works Co.,ltd .of, The center Exploitation Irrigation Works of Dak Nong;  Officials of communes	Along culverts, canals, and trenches on downstream face of dams in Dao Nghia, Dak Sin communes.	During operational phase	Operational and maintenance cost
2	Erosion or land slide	Manage erosion and land slide	<ul style="list-style-type: none"> <li>- Consider the need to reinforce road and canals banks, culverts and trenches.</li> <li>- Plant and maintain regularly vegetation cover on dam banks.</li> <li>- Regularly maintain trenches and dam banks.</li> <li>- Reinforce and plant grass at the roads and dam's slopes.</li> <li>- Regularly maintain and repair broken part of infrastructures (dam crest, irrigation systems, roads, etc.).</li> </ul>	The Dak Rlap Exploitation of Irrigation Works Co.,ltd .of, The center Exploitation Irrigation Works of Dak Nong	Along trenches, banks of dams, culverts; roads	During operational phase	Operational and maintenance cost

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
3	Traffic accident increase	Ensure traffic safety	<ul style="list-style-type: none"> <li>- Install speed limit and load limit signs to regulate traffic safety at residential areas and at road intersections.</li> <li>- Propagandize to enhance awareness of traffic safety for local people.</li> </ul>	Department of Infrastructure - Economy of Dak Rlap district	Along the upgraded roads and on dam rests in Dao Nghia communes	During operational phase	Operational and maintenance cost
4	Impact on water quality due to use of fertilizer or pesticide	Mitigate impacts on surface water	<ul style="list-style-type: none"> <li>- Cooperate with the extension service agencies to ensure that farmers receive training on sustainable farming methods, pest management.</li> <li>- Pits to collect package of pesticides, fertilizer must be constructed far from water sources and flood areas. And recommend people collecting these wastes, do not scatter them on field and/or canals.</li> <li>- Biological, environmental friendly pesticides must be introduced and prioritized to use.</li> <li>- Pesticides, which are less toxic,</li> </ul>	DARD of Dak Nong, PC of Dak Rlap The Dak Rlap Exploitation of Irrigation Works Co.,ltd of The center Exploitation Irrigation Works of Dak Nong	Quang Loc reservoir, , new constructed canals and the downstream canals, and beneficiary area of Dao Nghia and Dak Sin communes	During operational phase	Included in operational and maintenance cost

No.	Impacts	Objectives	Mitigation Measures				
			Mitigation measures	Responsibility	Location	Time	Cost
			<p>less durable in environment, high selective must be used.</p> <ul style="list-style-type: none"> <li>- Schedule of pesticides spreading must be appropriate to reduce the volume to a minimum in order to reduce pollution to local environment.</li> </ul>				
5	Dam break during operation	Ensure dam safety and prevent flooding locally and at the downstream of sub-project reservoirs.	<ul style="list-style-type: none"> <li>- Regularly check Quang Loc weir and reservoirs' safety conditions, particularly during the rainy season and whenever there is a problem caused by natural disasters, weather.</li> <li>- Keep tracks information of meteorology. when flooding is forecasted, precaution, rescue measures must be applied per direction of the Central and local flood prevention Board.</li> <li>- Upon detection of abnormalities, it is requested to report it timely and check, calculate the parameters to provide appropriate mitigation options.</li> </ul>	<p>The Dak Rlap Exploitation of Irrigation Works Co.,ltd of The center Exploitation Irrigation Works of Dak Nong</p> <p>And people in the sub-project's communes including Dak Sin &amp; Dao Nghia communes</p>	Quang Loc dam in Dao Nghia commune	During operational phase	Included in operational and maintenance cost

## 6.2 Environmental monitoring

Environmental monitoring consists of (i) Environmental effect monitoring and (ii) Environmental Compliance Monitoring.

### 6.2.1 Environmental effect monitoring

Monitoring environmental effect is shown in the following table:

**Table 5: Environmental effect monitoring**

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
Construction Stage						
Control of air quality and noise impact	Noise generated from sub-project areas and its equipment	Construction sites and along the constructed roads	Observation, document review and public consultation	Weekly and monthly	Contractor and CSC	Included in the civil work contracts and CSC contracts
Control of water quality	Sediment loads, rubbish, oil or other visible pollutants	Significant water bodies in sub-project areas	Observation, document review and public consultation, worker interview	Weekly and after large rain evens	Contractor and CSC	
Operational Stage						
Surface water quality	Turbidity, grease; chemicals of fertilizers and pesticides	Major streams from which they provide water for irrigation	Observation, document review and public consultation	2 times per year for first 2 years (1 time in wet season and 1 time in dry season)	The Dak Rlap Exploitation of Irrigation Works Co. Ltd . of The center Exploitation Irrigation Works of Dak Nong	Included in operation cost
Soil quality	Evidence of fertilizers & pesticides in soil	At 02 representative locations in each sub-project irrigated area	Observation, document review and public consultation	2 times per year for first 2 years (1 time in wet season and 1 time in dry season)	The Dak Rlap Exploitation of Irrigation Works Co. Ltd . of The center Exploitation Irrigation Works of Dak Nong	

### 6.2.2 Environmental compliance monitoring

The environmental effect monitoring is shown in the following table:

**Table 6: Environmental compliance monitoring**

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
<b>Construction Stage</b>						
EMP implementation provisions in construction contracts, construction supervision contracts	Availability of EMP implementation provisions in contracts	N/a	Check contracts	First monitoring time	LIC, CPMU, PPMU of Dak Nong	Included in the LIC contract
Manpower to implement EMP	Environment staff mobilization at PPMU of Dak Nong, supervisor, contractors	N/a	Discussion with stakeholders, document review	Every 6 months	LIC, PPMU of Dak Nong, CSC	Include in the LIC & CSC contracts
Landslide, erosion and sedimentation controls	Condition and capacity of controls Performance of all mitigation measure	Throughout construction sites	Observation, document review and public consultation	Weekly, monthly and/or after heavy rain	CSC, LIC, Dak Nong PPMU	Include in the LIC & CSC contracts
Surface water pollution	Turbidity, grease Performance of all mitigation measure	Da R'Keh spring, Quang Loc & Dak Sin reservoirs, irrigation works	Observation, document review and public consultation	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	
Soil contamination	Solid waste, grease availability Performance of all mitigation measure	Throughout construction sites & disposal site	Observation, document review and public consultation	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	
Materials storage	Condition of materials storage area	Throughout construction sites, borrow pit	Observation, document review and public consultation and worker interview	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	
Construction equipment	Noise and exhaust	Throughout construction	Observation, document	Weekly, monthly or	PPMU Dak Nong, LIC &	



Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
and vehicles	generation; covering of trucks; oil/ fuel leaks	sites	review and public consultation and worker interview	when community's feedback is raised	CSC	
Construction camp conditions	Cleanliness; waste disposal facilities; general condition	All construction camps	Observation, document review and worker interview	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	
Vegetation clearing	Boundaries of vegetation clearing	Areas of sensitive vegetation	Observation, document review and public consultation	Weekly during clearing works	PPMU Dak Nong, LIC & CSC	
Solid wastes management on the site	Dustbins and mobility septic tanks at work site  Check with waste generation, collected, transported and treated manners and documents  Performance of all mitigation measure	In all construction sites	Observation, document review and worker interview	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	
Waste disposal	Site cleanliness and condition; temporary waste storage area	Throughout construction sites	Observation, document review and public consultation	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	
Local flooding	Possibility of local flooding due to construction activities  Performance of all mitigation measure	Throughout construction sites	Observation, document review and public consultation	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	Include in the LIC & CSC contracts

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
Traffic accident may increase and difficulty for usual life of local people	Availability of signals or staff to control/guide road user at site	Road component at all villages around the subproject	Observation, document review and public consultation	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	Include in the LIC & CSC contracts
Impacts to existing infrastructure	Agreement letters between contractors and local authorities in using public facilities Types of damages; level of compensation; satisfaction from local authorities as well as local residents	In all construction sites	Observation, document review and worker interview	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	Include in the LIC & CSC contracts
Impact on terrestrial ecology	(i) if are trees cut outside of ROW; (ii) if re-plant vegetable cover	construction components	Observation, document review and public consultation	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	Include in the LIC & CSC contracts
Disturbance to local people's life due to crowded workers	Status of workers: registration to local authorities and conflicts available in the areas between local residents and workers	Throughout construction sites	Observation, document review and public consultation	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	Include in the LIC & CSC contracts
Risks to health and safety to local people and workers	Equipment available; percent of workers equipped with;	Throughout construction site	Observation, document review and public consultation and worker interview	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC & CSC	Include in the LIC & CSC contracts

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
	Provision of any warning signals in the sites  Performance of all mitigation measure					
Impact on existing irrigation system	Available of water for irrigation in crops	Irrigation canals and production fields	Observation, document review and public consultation	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC and CSC	Include in the LIC and CSC contracts
Impacts on surrounding agricultural land and cultivation activities	Available of water for irrigation in crops;  Crops impacts of communes	Agricultural areas around and in downstream of sub-project	Observation, document review and public consultation	Weekly, monthly or when community's feedback is raised	PPMU Dak Nong, LIC and CSC	Include in the LIC and CSC contracts
Cultural and historical heritages	Check each case and performance of contractors	Throughout construction site	Observation and public consultation and document review	If any	PPMU Dak Nong, LIC and CSC	Include in the LIC and CSC contracts
Environment recovery	Clearance activities	Worksites	Observation and public consultation	Once before hand over	PPMU Dak Nong, LIC and CSC	Include in the LIC and CSC contracts
<b>Operation Stage</b>						
Canals, culverts and trenches obstructing of flooding	Ensure canals culverts and trenches to be operated well	Dam banks, culverts and trenches, culverts, canals	Observation and public consultation	6 monthly for first 5 years of operation	The Dak Rlap Exploitation of Irrigation Works Co. Ltd . of The center Exploitation Irrigation Works of Dak Nong;	Included in operational stage budget
Risk of traffic accident increase due to better road surface	Controlling traffic accident	Roads & dam crests, bridges	Observation and discussion with local authority	6 monthly for first 5 years of operation	The Dak Rlap Exploitation of Irrigation Works Co. Ltd . of The center	

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
					Exploitation Irrigation Works of Dak Nong;	
Impact on water quality due to use of fertilizer or pesticide	Water usage safety	New constructed canals and the downstream canals	Observation and discussion with local authority	6 monthly for first 5 years of operation	The Dak Rlap Exploitation of Irrigation Works Co. Ltd . of The center Exploitation Irrigation Works of Dak Nong;	
Erosion or land slide	Ensure the canals/ reservoirs/roads to be operated well	Drainage trenches, banks of dams, culverts	Observation and discussion with local authority	6 monthly for first 5 years of operation	The Dak Rlap Exploitation of Irrigation Works Co. Ltd . of The center Exploitation Irrigation Works of Dak Nong;	
Environment recovery	Ensure environment is recovered	In all sub-project areas	Observation and discussion with local authority	6 monthly for first 5 years of operation	The Dak Rlap Exploitation of Irrigation Works Co. Ltd . of The center Exploitation Irrigation Works of Dak Nong;	

### 6.3 Capacity Building for EMP implementation

The relevant stakeholders need to ensure the EMP implementation as their responsibilities. All CPMU, PPMU, CSC, CC need to appoint officers/staffs to in charge of environmental management. However, most of these officers/staffs are also assigned for other works and they are not specialized in environmental management. Thus, to ensure EMP is implemented in compliance with sponsor policies and Vietnamese legislation, these officers/staffs must be guided /trained on EMP implementation capacity building. Training on EMP implementation must be held for different groups with different requirements.

- Dak Nong PPMU and CSC: The staffs that are in charge of environment will be trained (at least once in the first 3 months of the project) on monitoring and preparing environmental reports.
- Construction contractor: Will be trained (immediately after contract signing) on implementing mitigation measures and preparing reports.

**Table 7: Schedule of training on capacity building**

Agency	Session	Participant	Frequency of training	Duration and type	Responsibility	Cost
PPMU of Dak Nong	Environmental monitoring and report preparation	Environmental staffs, engineers	1 time when starting the project and then update it, if any, depending on implementation	1 day of training	CPMU/ LIC	Included in the project management cost and LIC contract
CSC	Environmental monitoring and report preparation	People who are in charge of environment and people related to environmental management	1 time when starting the project and then update it, if any, depending on implementation	1 day of training	CPMU/ LIC	Included in the project management cost and LIC contract
Construction Contractors	Implement mitigation measures	Main contractors report to PPMU of Dak Nong	1 time when signing contract then update it, if any, depending on implementation	1 day of training, monthly report form	CPMU/ LIC	Included in the project management cost and LIC contract

#### 6.4 Budget for EMP implementation

Budget for EMP implementation of this Sub-project is as following table:

**Table 8: Budget for EMP implementation**

Item	Preparation phase	Construction phase	Operation phase
Construction supervision consultant		Included in the contract with PPMU of Dak Nong	
Internal monitoring of PPMU Dak Nong	Included in the project management cost of PPMU of Dak Nong	Include in the contract of CC, CSC and PPMU of Dak Nong management cost.	Province and local budget
Implementing mitigation measures	Subproject preparation cost	Included in the construction contracts	Operation and maintenance cost
Monitoring EMP implementation (undertaken by LIC)		Included in the contract between CPMU & LIC	
Public consultation and information disclosure	Include in IEE preparation consultant contract	Include in the contract of civil works, CSC and Dak Nong PPMU management cost	Operation and maintenance costs

## VII. IMPLEMENTATION RESPONSIBILITY AND REPORTING

### 7.1 Implementation responsibility

Three agencies, which are related directly to EMP implementation, are PPMU, CSC and CC. The responsibilities of relevant stakeholders in EMP implementation are presented as table below.

**Table 9: Responsibility of stakeholders**

Agency	Responsibilities
CPMU	<ul style="list-style-type: none"> <li>- Recruit consultant for preparing safeguard policies.</li> <li>- Review, adopt and submit to ADB IEE reports.</li> <li>- Assign LIC to monitor EMP implementation.</li> <li>- Guide PPMU Dak Nong to integrate EMP into tender documents/ CSC contract.</li> <li>- Review monitoring reports of LIC and internal reports of PPMU Dak Nong.</li> <li>- Report EMP implementation to ADB.</li> <li>- Assign experienced staff to follow up and monitor EMP implementation.</li> </ul>
LIC	<ul style="list-style-type: none"> <li>- Prepare manual for EMP implementation and train on EMP implementation for PRI CHPs, CSCs and CCs.</li> <li>- Help Dak Nong PPMU integrate environmental safeguard requirements specified in the EMP into bidding documents/ construction supervision and construction contracts.</li> <li>- Periodically monitor EMP compliance every 6 months.</li> <li>- Report monitoring results and recommendations on EMP implementation to CPMU and sponsor for every 6 months.</li> </ul>
PPMU Dak Nong	<ul style="list-style-type: none"> <li>- PPMU Dak Nong is liable for any recommendations regarding improvement of the project with the aim of protecting and maintaining the environment. It Includes environmental complaints and complaints resolution related to subproject implementation.</li> <li>- Appoint specialized personnel to monitor environment of the subproject.</li> <li>- Publicly post EMP information at CPC where the project goes through. Integrate environmental requirements, including sanctions for failure to comply EMP into bids / contracts with CC and CSC.</li> <li>- Instruct and approve site EMP prepared by construction contractor.</li> <li>- Support and coordinate with the EMP implementation units.</li> <li>- Ensure adequate fund for EMP implementation.</li> <li>- Arrange and join capacity building training on EMP implementation conducted by LIC.</li> <li>- Periodically report EMP implementation to CPMU and Dak Nong DONRE.</li> </ul>
Construction supervision consultant (CSC)	<ul style="list-style-type: none"> <li>- Appoint staffs to be in charge of environment and participate in training courses conducted by LIC.</li> <li>- Review SEMP prepared by contractors and submitting it to PPMU of Dak Nong to get approval.</li> <li>- Beside monitor construction quality, CSC also implement compliance monitoring on environmental safeguard of construction contractors every day as stipulated in EMP.</li> <li>- Report monitoring results and findings to PPMU of Dak Nong monthly.</li> </ul>
Construction contractor	<ul style="list-style-type: none"> <li>- Appoint staffs to monitor environmental issues of the construction. This staff can be a concurrent staff if the workload of environmental is not heavy.</li> </ul>

Agency	Responsibilities
	<ul style="list-style-type: none"> <li>- Base on the EMP, CC will prepare a EMP.</li> <li>- Implement mitigation measures to minimize potential negative impacts as instructed in the EMP.</li> <li>- Closely coordinates with local communities to perform environmental mitigation measures during construction process.</li> <li>- Ensure that all construction activities have complete documents from the relevant authorities.</li> <li>- Implement all measures to minimize negative impacts and to protect environment.</li> <li>- Ensure that staff and employees understand the process and their duties in the EMP.</li> <li>- Report to PPMU of Dak Nong the difficulties and problems, if any.</li> <li>- Report to stakeholders the environmental issues and coordinate with them to solve those issues.</li> </ul>
Dak Nong PPC/ DONRE	<ul style="list-style-type: none"> <li>- Monitor any violation under policies on environmental management and protection of Vietnam.</li> <li>- Evaluate any change of the design, which can cause environmental impacts.</li> </ul>
Dak R'Lap DPC/ DONRE	<ul style="list-style-type: none"> <li>- Approve EPP of the subproject in accordance with the provisions of Vietnamese laws.</li> <li>- Monitor EMP implementation through internal monitoring system of the DPC.</li> </ul>
Social organizations, women union and other associations	<ul style="list-style-type: none"> <li>- Play a key role as a bridge between local community and PCs.</li> <li>- Implement Community Monitoring.</li> <li>- Mobilize community participation in subproject implementation.</li> <li>- Combine with the PPMU of Dak Nong and contractors to perform road measures to prevent public services from damage.</li> <li>- Participate in resolving environmental problems.</li> </ul>
Local communities	<ul style="list-style-type: none"> <li>- In Vietnam, the communities have the right and responsibility to regularly monitor environmental activities in the construction process to ensure that the rights and their safety is protected fully and mitigation measures are implemented effectively.</li> <li>- In case of problems, they will report to community team, contractors or PPMU of Dak Nong.</li> </ul>

## 7.2 Report system

Besides monitoring on EMP implementation, stakeholder is also responsible for periodic report EMP implementation. Table below shows the system of monitoring and reporting.

**Table 10: Monitoring and reporting system**

Phase	Report	Frequency	Responsibility	Submit to
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Phase	Report	Frequency	Responsibility	Submit to
Construction	Periodically report on implementation of mitigation measures: Present in details of EMP activities of the subproject/packages and monitoring results.	Every month	Construction contractor	PPMU of Dak Nong and CSC
	Periodically report on EMP implementation of construction contractor: Present in details of EMP activities of the subproject and monitoring results.	Every month	CSC	Dak Nong PPMU
	Periodically report on EMP implementation of the subproject: Present in details of EMP activities of the subproject and monitoring results.	Every 3 month during construction phase	PPMU Dak Nong	- CPMU; - DONRE of Dak Rlap district;
	Periodically monitoring report on EMP implementation of the subproject: Present in details environmental activities of the subproject and activities in compliance with EMP of the subproject and monitoring results.	Every 6 month during construction phase	CPMU/ LIC	ADB
Operation	Periodically report on EMP implementation at operation: Present in details activities in compliance with EMP of the subproject in the operation phase.	Every 6 month in first two years	District Sub-project Operation Agency	CPMU

## VIII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

Public consultation and information disclosure of the subproject have to be implemented continuously from the design phase to the construction phase. It is to collect community ideas/ as well as encourage local people' participation in preparing and implementing the subproject/EMP. Public consultation till the point of preparing IEE of the subproject. The minutes and pictures of public consultation are in Annex 1 & Annex 2.

### 8.1 Public consultation in the subproject preparation phase

#### 8.1.1 Public Consultation meetings

**Table 11: Public consultation description**

Consultation method	Description of activities	
By dispatches and meeting with local officers	Date of correspondence	- PPMU of Dak Nong contacted with local authorities by telephone to agree on public consultation; Dak Rlap district; Dak Sin & Dao Nghia commune;
	Dates of meetings (if requested)	- April, 2015
	Minutes of meeting attached (yes/ no)	- No
Public meeting	Organization date	- Morning of April 17, 2014 in Dak Sin commune; - Afternoon of April 17, 2015 in Dao Nghia commune;
	Organization location	- CPCs of Dak Sin and Dao Nghia communes; in the Halls of People Committees;
	Invitees	- Beneficiaries, headers of villages and representative of town local authorities;
	Invitation method	- By means of public media of the commune (header of villages announce every HH). The Women Association also invites women to attend the meetings.
	Meeting schedule attached (yes/ no)	- Yes
	Minutes of meeting attached (yes/ no)	- Yes
	Number of participants	- Dak Sin commune: 48 people (5 females) - Dao Nghia commune: 25 people (09 female).

#### 8.1.2 Result of the public consultations

All ideas/concerns from local people during the public consultations were reported by SPC to PPMU and integrated into the IEE as stable in table 4 (EMP) of IEE. See the summary of the main ideas/concerns as the table below:

**Table 12: Results of public consultations**

Issues raised		Required follow-up actions?
Description	By Whom?	
Potential damage existing road	Local people	Contractors' trucks with maximum capacity of less than 10 tons;
Abundant solid waste from constructional activities (if any) to be used by local people	Local people	Contractors have to notify abundant solid waste to local people if it is available.
Original environment recovery	Local people	<ul style="list-style-type: none"> <li>- Contractors have to recover environment at sites e.g.</li> <li>- Inappropriate landfills of the subprojects;</li> <li>- Recover mines, especially borrow pits;</li> <li>- Temporary land occupation around sites and on roads,</li> <li>- Check survival of trees and plants complementarily if any</li> </ul>
Bad quality of the proposed works	Local people	- Local people agree to take part in community monitoring team set up by PPMU of Dak Nong and local authorities;

**8.2 Public consultation in the future****Table 13: Expected public consultation activities**

Activities	Participants	Expected results	Schedule	Cost
Community meeting before construction commence	Dak Nong PPMU, CC, CSC, representative of local authorities and local people.	<ul style="list-style-type: none"> <li>- Announce construction items and construction plan.</li> <li>- Agree on details of mitigation measures (especially water off schedule).</li> </ul>	1 week before construction commence.	Included in Dak Nong PPMU budget
Periodic meeting	CC, CSC and representative of local authorities, organizations and local people.	<ul style="list-style-type: none"> <li>- Periodically monitor mitigation measures application, and outstanding issues;</li> <li>- Propose mitigation measures and agree on implementation.</li> </ul>	Every 1 month from the construction commence.	Included in the contracts

**8.3 Public information disclosure**

- After adopted, Dak Nong PPMU is responsible for posting IEE summary at Dak Sin and Dao Nghia People's Committees.
- IEE will be posted on ADB Websites.

## IX. GRIEVANCE REDRESS MECHANISM

### 9.1 Purpose of the mechanism

During the deployment of the subproject, local people are disseminated environmental protection activities such as EMP. Negative impacts on the environment may occur during the construction and operational phases. Any comments/ suggestions of local people will be solved quickly, transparently and protected by law, particularly for affected people by the subproject. Complaint handling mechanism was classified by level and responsibilities of involved parties.

### 9.2 Grievance redress mechanism

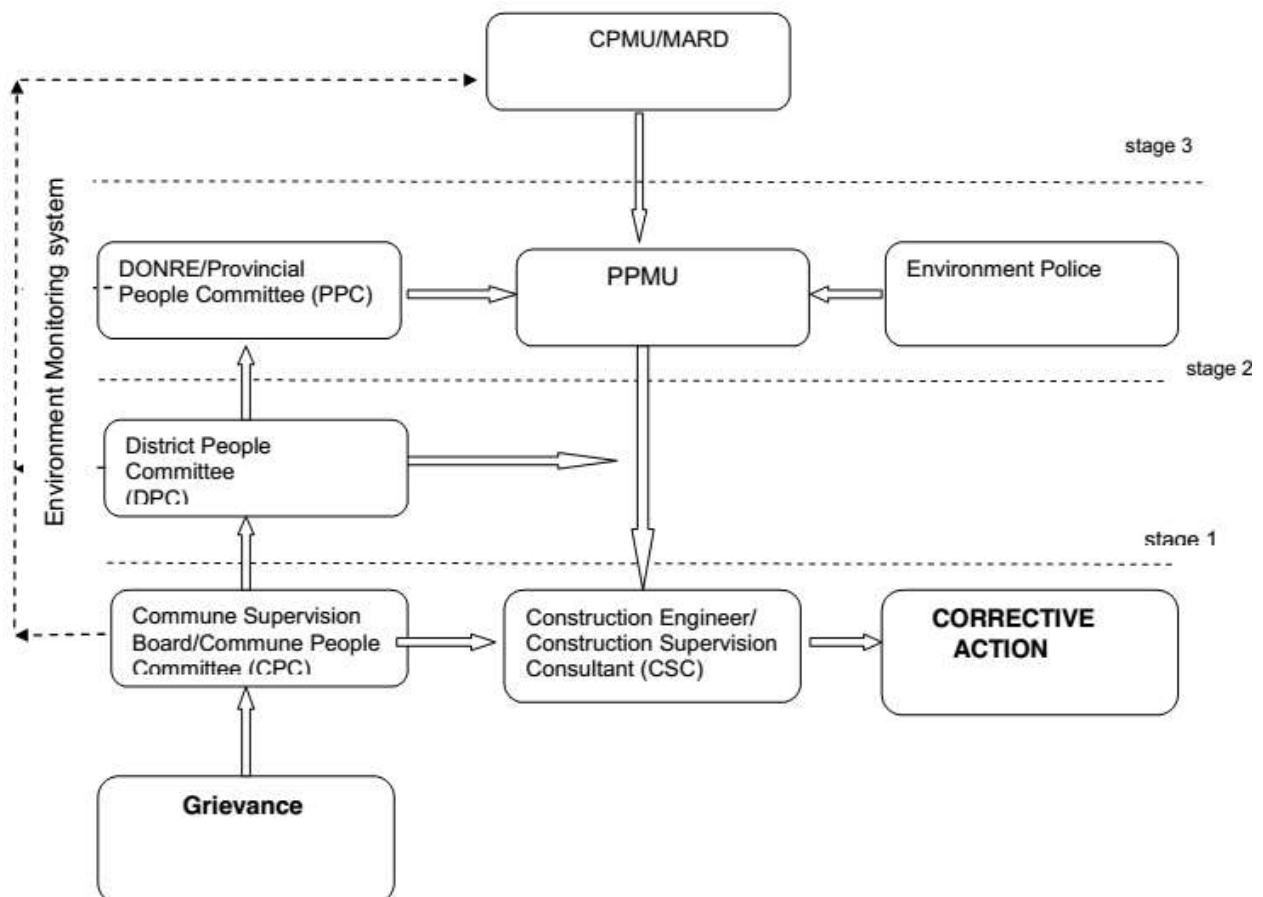
Per the environmental management frame, there are 03 steps to redress complaint as below:

**Stage 1:** If a household has any complaint, he/she can submit a complaint to the CPC-community monitoring board. CPC will work with CSC and CC to solve complaints.

**Stage 2:** If the complaint is not resolved, the complainant will submit an application to the Dak Rlap DPC to resolve the complaint.

**Stage 3:** If more than 15 days but no response from Dak Rlap DPC, the complainant may submit a complaint to the Dak Nong PPC (through Dak Nong DONRE). Dak Nong PPC will require Dak Rlap DPC to solve the complaint. In case the complaint is still not resolved, Dak Nong PPC will require environmental police to investigate and requested stakeholders to resolve the complaint. See the mechanism in figure 1 below:

**Figure 2: Grievance redresses mechanism**



## **X. CONCLUSION, COMMITMENT AND RECOMMENDATION**

### **10.1 Conclusion**

The results of environmental screening and initial environmental examination show that the sub-project may cause some adverse environmental impacts but that most of such impacts are insignificant. However, the appropriate mitigation measures have also proposed to manage the negative impacts and maximize the benefit of the sub-project. The responsibilities of implementation, monitoring of the stakeholders have also identified to ensure environmental compliance.

### **10.2 Commitment**

PPMU Dak Nong of the sub-project “Repairing, upgrading Quang Loc irrigation works systems in Dao Nghia commune and in Village No.2, Dak Sin commune, Dak Rlap district, Dak Nong province” commit themselves to:

- Implement requirements of environmental safeguards as stated in IEE via information dissemination, integrating environmental considerations as stated in this IEE in bidding documents, and in the CSC contracts; mobilize human resources and monitor internally the IEE compliance;
- Report environmental management plan’s implementation to Dak Nong DONRE and Dak Nong CPMU periodically as specified in the IEE;
- Compensate and take mitigation measures to avoid and/or reduce environmental pollution if there are any problem during operation of the sub-project;
- Handle complaints/grievance if any.

### **10.3 Recommendations**

Base on the IEE report, Dak Nong PPMU would recommend that:

- No further environmental assessment is needed because the impacts on environment are insignificant.
- Based on IEE, Dak Nong PPMU would like to request functional authorities to appraise and approve of IEE for “Upgrading of Quang Loc & Dak Sin irrigation work systems, in Dao Nghia and Dak Sin communes” to create basis for next implementation steps, ensuring the implementation progress, effectiveness and benefits of the project.

## XI. ANNEXES

### Annex 1: Images of public consultation at the sub-project



Site surveys and discussion with local people and authorities for impact identification and land acquisition



Public consultation for environmental impacts & mitigation measures



## Annex 2: Public consultation minutes

### 1. Public consultation minute in Dak Sin commune

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

**BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG**

**Dự án: “Phát triển cơ sở hạ tầng nông thôn phục vụ sản xuất cho các tỉnh Tây Nguyên”**

**Tiểu dự án: “Sửa chữa nâng cấp công trình thủy lợi Quảng Lộc, thôn 2 Đắk Sin, huyện Đắk R’Lấp ”**

Hôm nay, ngày 17 tháng 07 năm 2015, tại UBND xã Đắk Sin, huyện Đắk R’Lấp, tỉnh Đắk Nông

#### I. THÀNH PHẦN THAM DỰ:

##### 1. Đại diện Ban QLDATEW (CPMU):

Ông: ...Lương Thị Dung... - Chức vụ: ...CB Ban QLDATEW...  
Bà: ...Vy Thị Phương Nga... - Chức vụ: ...CB Ban QLDATEW...

##### 2. Đại diện Ban QLDATEW tỉnh (PPMU):

Ông (bà) ...Lê Văn Hòa... - Chức vụ: ...CB Kỹ Thuật...  
Ông (bà) ...Nguyễn Nhân Thành... - Chức vụ: ...CB Kỹ Thuật...  
Ông (bà) ... - Chức vụ: ...

##### 3. Đại diện công ty TNHH Tư vấn Đầu tư và Bảo vệ Môi trường EPC:

Ông (bà) ...Lê Đức Huy... - Chức vụ: ...Chuyên gia...  
Ông (bà) ... - Chức vụ: ...  
Ông (bà) ... - Chức vụ: ...

##### 4. Đại diện UBND xã Đắk Sin

Ông (bà) ...Nguyễn Xuân Quý... - Chức vụ: ...Chủ tịch...  
Ông (bà) ...Lý Thị Minh... - Chức vụ: ...  
Ông (bà) ...Phạm Văn Hải... - Chức vụ: ...

##### 5. Đại diện các ban ngành khác:

Ông (bà) ... - Chức vụ: ...  
Ông (bà) ... - Chức vụ: ...  
Ông (bà) ... - Chức vụ: ...

**6. Các hộ bị ảnh hưởng/hưởng lợi bởi dự án: Có danh sách đính kèm**Tổng số người tham gia: 48.....Trong đó: Nam: 42.....người, chiếm 87,5%Nữ: 6.....người, chiếm 12,5%Độ tuổi trung bình: từ 30.....đến 75.....tuổi.

Cùng tiến hành tổ chức họp tham vấn cộng đồng để phổ biến thông tin về tiểu dự án và tham vấn ý kiến phục vụ lập các tài liệu chính sách an toàn cho tiểu dự án “**Sửa chữa, nâng cấp công trình thủy lợi Quảng Lộc, thôn 2 Đắk Sin, huyện Đắk D’Ráp**” bao gồm:

(i) Kế hoạch tái định cư (RP); Kế hoạch phát triển dân tộc thiểu số (EMDP) và (iii) Kiểm tra môi trường ban đầu/kế hoạch quản lý môi trường (IEE/EMP).

**II. NỘI DUNG THAM VẤN****2.1. Giới thiệu tóm tắt và phổ biến thông tin về tiểu dự án.**

**2.2. Giới thiệu về các nguyên tắc và chính sách của dự án về (i) Chính sách tái định cư; (ii) chính sách phát triển dân tộc thiểu số; và (iii) chính sách về môi trường.**

**3.3. Tham vấn cộng đồng****III. TÓM TẮT KẾT QUẢ THAM VẤN:**

Những ý kiến đề xuất của người dân về vấn đề được tham vấn:

**3.1. Vấn đề tái định cư**

Việc thực hiện tái định cư có gây ra mất đất canh tác của một số hộ dân. Tuy nhiên, các hộ dân đều đồng ý việc đất

**3.2. Vấn đề về môi trường**

Khi thực hiện tái định cư có thể gây ra các tác động đến môi trường. Vì vậy, yêu cầu nhà thầu,



phải tuân thủ các biện pháp giảm nhẹ  
- Yêu cầu thực hiện đúng tiến độ thi công để giảm thiểu  
tác động của dự án đến người dân địa phương

- Những cơn mưa đi vào khu vực xây dựng TĐA  
Trong quá trình xây dựng nên đề xuất xây dựng,  
hỗ trợ giải pháp yêu cầu nhà thầu xây dựng  
bắt buộc lại

- Để tối thiểu ưu tiên cho người dân địa phương  
tận dụng để san lấp mặt bằng, sân của họ

### 3.3. Vấn đề về dân tộc thiểu số

Việc thực hiện TĐA không gây mất mát của  
quốc gia hay tài sản của người dân tộc thiểu số

### 3.4 Các ý kiến chung khác

100% các hộ đi họp đồng ý ủng hộ dự án  
và mong dự án sớm được thực hiện. Các tác  
động môi trường - xã hội là không đáng kể so  
với lợi ích mà dự án mang lại.

Biên bản kết thúc vào lúc ..... giờ cùng ngày, đã đọc lại cho mọi người có mặt cùng nghe và thống nhất ký tên.

**CÁC BÊN THÔNG NHẤT KÝ TÊN**

Đại diện PPMU tỉnh

  
Lê Việt Hoa


Đại diện UBND xã

  
  
**CHỦ TỊCH**  
**HOÀNG XUÂN QUÝ**

Nhóm tham vấn

  
  
**GIÁM ĐỐC**  
**Nguyễn Kim Sơn**

Đại diện Ban ngành đoàn thể xã

  
Phan Văn Hới

Đại diện hộ dân dự họp

  
Trần Thị Sửu  
Chú  
Nguyễn Thị桂  
Hồng Thị Quốc  
Quang  
Nguyễn Quang

[illegible]



## DANH SÁCH THAM GIA CUỘC HỌP

(Kèm theo biên bản tham vấn ngày tháng năm 2015)

STT	Họ và tên	Tuổi	Dân tộc	Giới tính		Ký tên
				Nam	Nữ	
1	Nguyễn Văn Hào	44	Kinh	x		
2	Đỗ Thị Tý	75	NT		x	
3	Thạch Khanh Kha		Kinh	x		
4	TRẦN HỒNG VINH	56	K	x		
5	TRẦN VĂN TUYẾN	41	K	x		
6	Bùi Xuân Kiêm	51	NT	x		
7	Đoàn Huệ Quyên	40	Kinh	x		
8	Phạm Ngọc Liên	52	Kinh	x		
9	TRẦN ĐỨC QUANG	48	Kinh	x		
10	Nguyễn Văn Năm	57	Kinh	x		
11	Nguyễn Văn Hùng	58	Kinh	x		
12	Lê Văn Sơn	35	NT	x		
	Đỗ Hữu Toàn	48	K	x		
	Nguyễn Văn Thành	42	K	x		
	Vũ Văn Tật	58	K	x		
	Phạm Ngọc Bình	60	K	x		
	Phạm Văn Hùng	56	K	x		
	Vũ Đăng Ngọc	70	K	x		
	Ng. Hữu Tài					
	Phạm Ngọc Bình					
	Lý Văn Cường	30	K	x		
	NGUYỄN VĂN HÒA	47	K	x		
	Đỗ Thanh Tâm	52	K	x		

## 2. Public consultation minute in Dao Nghia commune

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

**BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG**

**Dự án: “Phát triển cơ sở hạ tầng nông thôn phục vụ sản xuất cho các tỉnh Tây Nguyên”**

**Tiểu dự án: “Sửa chữa nâng cấp công trình thủy lợi Quảng Lộc, thôn 2 Đắk Sin, huyện Đắk R’Lấp ”**

Hôm nay, ngày 17 tháng 04 năm 2015, tại UBND xã Đạo Nghĩa, huyện Đắk R’Lấp, tỉnh Đắk Nông

### I. THÀNH PHẦN THAM DỰ:

#### 1. Đại diện Ban QLDATEW (CPMU):

Ông: ... Lương Thị Dũng ... - Chức vụ: ... CB Ban QLDATEW  
Bà: ... Võ Thị Phương Nga ... - Chức vụ: ... CB Ban QLDATEW

#### 2. Đại diện Ban QLDA tỉnh (PPMU):

Ông (bà) ... Lê Việt Hòa ... - Chức vụ: ... CB Kế Hoạch  
Ông (bà) ... - Chức vụ: ...  
Ông (bà) ... - Chức vụ: ...

#### 3. Đại diện công ty TNHH Tư vấn Đầu tư và Bảo vệ Môi trường EPC:

Ông (bà) ... Lê Đức Huy ... - Chức vụ: ... Chuyên gia  
Ông (bà) ... - Chức vụ: ...  
Ông (bà) ... - Chức vụ: ...

#### 4. Đại diện UBND xã Đạo Nghĩa

Ông (bà) ... Phạm Minh Thu ... - Chức vụ: ... Bí thư kiêm Chủ tịch  
Ông (bà) ... Nguyễn Văn Quyết ... - Chức vụ: ... PCT Xã  
Ông (bà) ... - Chức vụ: ...

#### 5. Đại diện các ban ngành khác:

Ông (bà) ... Nguyễn Hữu Lợi ... - Chức vụ: ... CT MITQ xã  
Ông (bà) ... - Chức vụ: ...  
Ông (bà) ... - Chức vụ: ...

**6. Các hộ bị ảnh hưởng/hưởng lợi bởi dự án: Có danh sách đính kèm**

Tổng số người tham gia: 25 /....., chiếm.....% số người ảnh hưởng của xã.

Trong đó: Nam: 16 người, chiếm 64.%

Nữ: 9 người, chiếm 36.%

Độ tuổi trung bình: từ 31 đến 75 tuổi.

Cùng tiến hành tổ chức họp tham vấn cộng đồng để phổ biến thông tin về tiểu dự án và tham vấn ý kiến phục vụ lập các tài liệu chính sách an toàn cho tiểu dự án "Sửa chữa nâng cấp hệ thống thủy lợi Đăk Snghe và hạ tầng nông thôn phục vụ sản xuất khu vực xã Tân Lập" bao gồm: (i) Kế hoạch tái định cư (RP); Kế hoạch phát triển dân tộc thiểu số (EMDP) và (iii) Kiểm tra môi trường ban đầu/kế hoạch quản lý môi trường (IEE/EMP).

**II. NỘI DUNG THAM VẤN****2.1. Giới thiệu tóm tắt và phổ biến thông tin về tiểu dự án:**

**2.2. Giới thiệu về các nguyên tắc và chính sách của dự án về** (i) Chính sách tái định cư; (ii) chính sách phát triển dân tộc thiểu số; và (iii) chính sách về môi trường.

**2.3. Tham vấn cộng đồng****III. TÓM TẮT CÁC KẾT QUẢ THAM VẤN:**

Những ý kiến đề xuất của người dân về vấn đề được tham vấn:

**3.1. Vấn đề tái định cư (bồi thường, thu hồi đất)**

Tiểu dự án đi qua xã được xây dựng trên nền đất nông nghiệp. Không có vấn đề thu hồi đất, bồi thường, tái định cư. Không có.

**3.2. Vấn đề về môi trường**

Trong quá trình thi công xây dựng nhà dân phải thực hiện đúng theo thiết kế nền để xây dựng.



- Về lợi ích của dân thì nhà thầu phải bồi thường  
- Có được đi lại người dân rất vui mừng. Tuy nhiên,  
lưu khi xây dựng xong cần phải có đơn vị giám  
sát tải trọng xe đi vào  
- Cần phải có các lưu lại cần phải được quản lý  
chặt chẽ, tăng kỹ thuật tưới tẩm vùng đất  
- Đất đá thải ưu tiên cho người dân địa  
phương tận dụng để san lấp mặt bằng, sân  
nhà của họ

### 3.3. Vấn đề về dân tộc thiểu số

Khi thực hiện TĐA không làm mất đất đai  
của người dân tộc thiểu số. Tuy nhiên, người  
dân mong muốn được ưu tiên tuyển dụng làm những  
công việc phổ thông, để tạo công ăn việc làm cũng  
như thu nhập cho người dân tộc thiểu số trong  
quá trình thi công.

### 3.4 Các ý kiến chung khác

- 100% người dân dự họp đồng ý triển khai  
dự án và mong đợi ăn nên làm ra, cải thiện  
chức năng sống cho người dân
- Tác động môi trường và xã hội tích cực là lớn  
hơn nhiều các tác động tiêu cực

Biên bản kết thúc vào lúc ..... giờ cùng ngày, đã đọc lại cho mọi người có mặt cùng nghe và thống nhất ký tên.

**CÁC BÊN THỐNG NHẤT KÝ TÊN**


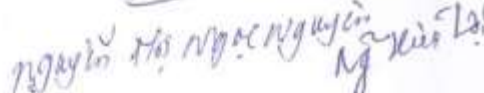
Đại diện PPMU tỉnh

  
Lê Việt Hoa

Đại diện UBND xã

  
Phạm Minh Thu

Đại diện Ban ngành đoàn thể xã

  
Nguyễn Hộ Ngọc  
  
Nguyễn Xuân Lai

Nhóm tham vấn



  
GIÁM ĐỐC  
Nguyễn Nam Sơn

Đại diện hộ dân dự họp

  
Nguyễn Thị Chi  
  
Phan Chu Chi  
  
Nguyễn Thị Hồng  
  
Trần Thừa Võ  
  
Trần Thị Quế  
  
Trương Thanh Long



(Kèm theo biên bản tham vấn ngày 17 tháng 4 năm 2015)

STT	Họ và tên	Tuổi	Dân tộc	Giới tính		Ký tên
				Nam	Nữ	
1	Phạm Văn Thọ	63	Kinh	X		18
2	Trương Thanh Long	37	Kinh	X		26
3	Lê Đức Đạt	75	Kinh	X		28
4	Đặng Uí	85	"	X		29
5	Nguyễn Văn Quý	42	Kinh	X		30
6	Lê Đình Dũng	48	Kinh	X		31
7	Nguyễn Văn Thập	48	Kinh	X		32
8	Trần Văn Lâm	49	Kinh	X		33
9	Nguyễn Thị	51	Kinh		X	34
10	Nguyễn Thị Hồng	48	Kinh		X	35
11	Trần Văn Hồng	50	Kinh	X		36
12	Phan Chu Chu	43	Kinh		X	37
13	Nguyễn Văn Lợi	56	"	X		38
14	Võ Thị Thân	46	"		X	39
15	Võ Thị Ngọc	38	"		X	40
16	Trần Thị Su	69	"		X	41
17	Nguyễn Thị	48	"	X		42
18	Lê Thị Lý	31	"		X	43
19	Trần Thị Võ	63	"	X		44
20	Phạm Kiên	55	"	X		45
21	Trần Thị Quỳnh	50	"		X	46
22	Nguyễn Văn Đạt	70	Kinh	X		47
23	Nguyễn Văn Ngọc	51	Kinh		X	48
24	Nguyễn Văn Nhật	35	Kinh	X		49
25	Nguyễn Phúc Hiệp		"	X		50

**Annex 3: Minutes and diagrams material mines and waste disposal**

(Minute for borrow pit & disposal yard in Dao Nghia commune

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

**BIÊN BẢN LÀM VIỆC**

Hôm nay ngày 17 tháng 06 năm 2016, tại văn phòng UBND xã: Đạo Nghĩa, huyện Đắk R'lấp, tỉnh Đắk Nông chúng tôi gồm:

1. Ban Quản lý dự án "Phát triển cơ sở hạ tầng nông thôn phục vụ sản xuất cho các tỉnh Tây Nguyên", tỉnh Đắk Nông,  
Ông: Nguyễn Nhân Thành; Chức vụ: Cán bộ Phòng Kế hoạch-Kỹ thuật.

2. Ủy ban Nhân dân xã Đạo Nghĩa, huyện Đắk R'lấp, tỉnh Đắk Nông,  
Ông: Nguyễn Văn Quyết.....; Chức vụ: Chủ tịch xã Đạo Nghĩa  
Ông: Tưong Quốc Hưng.....; Chức vụ: Cán bộ địa chính

Nội dung:


Xác định vị trí bãi vật liệu, vị trí bãi thải phục vụ công tác triển khai tiểu dự án: Sửa chữa, nâng cấp công trình thủy lợi Quảng Lộc, thôn 2 Đắk Sin, huyện Đắk R'lấp thuộc Dự án Phát triển cơ sở hạ tầng nông thôn phục vụ sản xuất cho các tỉnh Tây Nguyên.

Sau khi đi kiểm tra thực địa, đối chiếu với hồ sơ thiết kế, các bên thống nhất một số nội dung sau:

1. Vị trí bãi vật liệu (Không đền bù)  
Địa điểm: Thôn Quảng Thọ.....; Tờ bản đồ: 12/322; diện tích: 22.62 ha  
Cự ly vận chuyển đất trung bình:.....6,00 Km

2. Vị trí bãi thải (Không đền bù)  
Địa điểm: Thôn Quảng An.....; Tờ bản đồ: 23/50.....; diện tích: 2,266 ha  
Cự ly vận chuyển đất trung bình:.....4,00 Km

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

**ĐD. UBND XÃ ĐẠO NGHĨA**  
  
Nguyễn Văn Quyết

**ĐD. BQLDA PPMU tỉnh Đắk Nông**  
1  
Nguyễn Nhân Thành

**Annex 4: Results of environmental monitoring**

(The first monitoring results from The Center of Monitoring of Resources &amp; Environment of Dak Nong, 2016)

## 1. Air quality monitoring results (sampled from 15.05.2016 – 31.5.2016)

No	Parameter	Unit	Sample no.					QCVN 05:2013/ BTNMT	QCVN 26:2010/ BTNMT
			KK20	KK21	KK22	KK23	KK24		
1	Noise	dBA	51,5	59,9	57,1	55,6	45,7	-	70
2	Dust	µg/m <sup>3</sup>	16	331	24	316	18	300	-
3	SO <sub>2</sub>	µg/m <sup>3</sup>	193,7	143,6	185,8	118,3	215,6	350	-
4	NO <sub>2</sub>	µg/m <sup>3</sup>	129,2	101,0	249,2	115,7	120,5	200	-

## Sampling Location:

- KK20\_HT is at Kien Duc bridge (X 392374; Y 1327672)
- KK21\_HT is at Nhan Co T-junction (X 400101; Y 1324922)
- KK22\_HT is at Kien Duc market (X 392270; Y 1326614)
- KK23\_HT is at Dak Ru residential area (X 379358; Y 1316942); and
- KK24\_HT is at Dak R'lap landfill (X 389923; Y 1327161)

## 2. Surface water quality monitoring results (sampled from 15.05.2016 – 31.5.2016)

No	Parameter	Sample No.			QCVN 08-MT:2015/BTNMT (A <sub>2</sub> )
		NM17	NM18	NM19	
1	pH	6.25	6.845	6.82	<b>6-8,5</b>
2	DO	3.32	5.32	5.13	<b>≥ 5</b>
3	TSS	13	4.5	6	<b>30</b>
4	COD	24	24	18	<b>15</b>
5	BOD5 (20°C)	13.4	13.43	10.2	<b>6</b>
6	Ammonia (NH <sub>4</sub> <sup>+</sup> )	1.24	KPH	KPH	<b>0,3</b>
7	Nitrite (NO <sub>2</sub> <sup>-</sup> )	0.011	0.008	0.010	<b>0,05</b>
8	Nitrate (NO <sub>3</sub> <sup>-</sup> )	0.195	0.029	0.02	<b>5</b>
9	Phosphate (PO <sub>4</sub> <sup>3-</sup> )	0.07	0.03	0.02	<b>0,02</b>
10	Crom VI (Cr <sup>6+</sup> )	0.006	0.0029	0.0026	<b>0,02</b>
11	Cooper (Cu)	<0.015 <sup>(*)</sup>	<0.025 <sup>(*)</sup>	<0.025 <sup>(*)</sup>	<b>0,2</b>
12	Zinc (Zn)	<0.06 <sup>(*)</sup>	0	0	<b>1,0</b>
13	Iron (Fe)	3.81	0.33	0.33	<b>1</b>
14	Mangan (Mn <sup>2+</sup> )	0.728	<0.016 <sup>(*)</sup>	<0.025 <sup>(*)</sup>	<b>0,02</b>

Sample locations:

- NM17\_HT at Kien Duc bridge (X 0392374; Y 1327672)
- NM18\_HT at Nhon Co Lake (X 0399799; Y 1324390) and
- NM19\_HT at Nhon Co lake (after discharge point of Alumni Factory) (X 0398421; Y 1323924).

## 3. Groundwater quality monitoring results (from 15 – 31.05.2016)

No	Parameter	Sample no,					QCVN 09-MT:2015/BTNMT
		NN17	NN18	NN19	NN20	NN21	
1	pH	6.14	3.73	4.96	6.81	5.12	5,5-8,5
2	Hardness (CaCO <sub>3</sub> )	40.63	7.93	4.95	51.53	9.91	500
3	COD	3.37	5.54	4.74	5.94	2.77	4
4	Ammonia (NH <sub>4</sub> <sup>+</sup> )	KPH	3.06	KPH	KPH	KPH	1
5	Chloral (Cl <sup>-</sup> )	6.57	22.01	3.91	<3.0 <sup>(*)</sup>	<3.0 <sup>(*)</sup>	250
6	Nitrite (NO <sub>2</sub> <sup>-</sup> )	0.024	0.009	<0.003 <sup>(*)</sup>	<0.003 <sup>(*)</sup>	0.044	1
7	Nitrate (NO <sub>3</sub> <sup>-</sup> )	5.10	0.79	0.17	0.07	0.82	15
8	Sulfate (SO <sub>4</sub> <sup>2-</sup> )	<4.2 <sup>(*)</sup>	<4.2 <sup>(*)</sup>	<4.2 <sup>(*)</sup>	<4.2 <sup>(*)</sup>	<4.1 <sup>(*)</sup>	400
9	Phosphate (PO <sub>4</sub> <sup>3-</sup> )	0.13	0.07	0.05	0.33	0.05	0,2
10	Crom VI (Cr <sup>6+</sup> )	<0.015 <sup>(*)</sup>	KPH	KPH	KPH	<0.015 <sup>(*)</sup>	0,05
11	Cooper (Cu)	0.01	0.01	<0.01 <sup>(*)</sup>	<0.01 <sup>(*)</sup>	<0.01 <sup>(*)</sup>	1
12	Mangan (Mn)	KPH	0.2282	0	0	<0.015 <sup>(*)</sup>	0,5
13	Iron (Fe)	0.04	0.54	0.06	0.13	0.09	5
14	Zinc (Zn)	<0.04 <sup>(*)</sup>	0.0465	<0.04 <sup>(*)</sup>	<0.04 <sup>(*)</sup>	0	3
15	Assen (As)	KPH	KPH	KPH	KPH	KPH	0,05

Ground water sample locations:

- NN17\_HT at Nhan Co T-Junction (X 0400019; Y 1324922)
- NN18\_HT at Nguyen Thi Tuyet household in Kien Duc Town (X 0392319; Y 1326669)
- NN19\_HT at General Hospital in Kien Duc Town (X 0393985; Y 1327964) NN20\_HT at Tran Thi Phuong household in Nhan Dao commune (X 0398016; Y 1322630) NN21\_HT at Tran Thi Thu Thuy household in Dak Ru commune (X 0380212; Y 1317109); and
- NN22\_HT at Nguyen Nhu Thuan household near General Hospital of District (X 0394350; Y 1328196).



**Annex 5: Minutes of UXO disarming completion**

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

*Đắk Nông, ngày 27 tháng 11 năm 2015*

**BIÊN BẢN NGHIỆM THU HOÀN THÀNH  
HẠNG MỤC CÔNG TRÌNH ĐỂ ĐƯA VÀO SỬ DỤNG**

**Tiểu dự án:** Sửa chữa, nâng cấp công trình thủy lợi Quảng Lộc, thôn 02  
Đắk Sin, huyện Đắk R'lấp.

**Gói thầu 04-09:** Dò tìm, xử lý bom mìn, vật nổ.

**Địa điểm:** Huyện Đắk R'lấp, tỉnh Đắk Nông.

**I. Thành phần tham gia bàn giao:**

**1. Đại diện Chủ đầu tư:** Ban Quản lý dự án "Phát triển cơ sở hạ tầng nông thôn phục vụ sản xuất cho các tỉnh Tây Nguyên", tỉnh Đắk Nông.

- Ông: Trần Ngọc Minh Sơn	- Chức vụ: Phó Giám đốc
- Ông: Phạm Vũ Lâm	- Chức vụ: Cán bộ kỹ thuật

**2. Đại diện đơn vị thi công:** Trung tâm Dò tìm, xử lý bom mìn, vật nổ và Xây dựng 97 - CN Tổng công ty Xây dựng Trường Sơn.

- Ông: Lê Viết Quân	- Chức vụ: Giám đốc
- Ông: Nguyễn Văn Tú	- Chức vụ: Chỉ huy trưởng công trường
- Ông: Phạm Công Hợp	- Chức vụ: Kỹ thuật thi công

**Thời gian, địa điểm tiến hành nghiệm thu:**

Bắt đầu : 08h00 ngày 27 tháng 11 năm 2015

Kết thúc : 16h00 ngày 27 tháng 11 năm 2015

Địa điểm: Tại hiện trường dự án.

**Đánh giá hạng mục công trình:**

**a. Tài liệu làm căn cứ để nghiệm thu:**

- Thông tư 121/2012/TT-BQP ngày 12/11/2012 của Bộ Quốc phòng về việc ban hành Quy chuẩn kỹ thuật quốc gia về rà phá bom mìn, vật nổ
- Quy trình kỹ thuật ban hành kèm theo Quyết định số 95/2003/QĐ-BQP ngày 12/2003; Hướng dẫn áp dụng Quy trình kỹ thuật dò tìm, xử lý bom mìn, vật nổ ban hành kèm theo Quyết định số 165/2004/QĐ-BQP ngày 13/12/2004;
- Quyết định số 1136/QĐ-BQP ngày 09/4/2014 của Bộ trưởng Bộ Quốc phòng về việc tổ chức thực hiện công tác rà phá bom mìn, vật nổ dự án: Phát triển cơ sở hạ tầng nông thôn phục vụ sản xuất cho các tỉnh Tây Nguyên, địa bàn tỉnh Đắk Nông;

- Quyết định số 343/QĐ-TCT ngày 18/4/2014 của Tổng Giám đốc Tổng công ty Xây dựng Trường Sơn về việc giao nhiệm vụ khảo sát, lập phương án kỹ thuật, dự toán và thi công rà phá bom mìn, vật nổ dự án: Phát triển cơ sở hạ tầng nông thôn phục vụ sản xuất cho các tỉnh Tây Nguyên, địa bàn tỉnh Đắk Nông cho Trung tâm Dò tìm, xử lý bom mìn, vật nổ và Xây dựng 97;

- Quyết định số 3046/QĐ-BQP ngày 31/7/2015 của Bộ Quốc phòng về việc phê duyệt Phương án kỹ thuật thi công, dự toán rà phá bom mìn, vật nổ Tiểu dự án: Sửa chữa, nâng cấp công trình thủy lợi Quảng Lộc, thôn 02 Đắk Sin, huyện Đắk R'lấp thuộc dự án: Phát triển cơ sở hạ tầng nông thôn phục vụ sản xuất cho các tỉnh Tây Nguyên, tỉnh Đắk Nông;

- Quyết định số 1362/QĐ-UBND ngày 10/9/2015 của UBND tỉnh Đắk Nông về việc phê duyệt dự án đầu tư xây dựng công trình tiểu dự án Sửa chữa nâng cấp công trình thủy lợi Quảng Lộc, thôn 02 Đắk Sin, huyện Đắk R'lấp thuộc dự án Phát triển cơ sở hạ tầng nông thôn phục vụ sản xuất cho các tỉnh Tây Nguyên, vốn vay Ngân hàng Phát triển Châu Á (ADB);

- Quyết định số 520/QĐ-SNN ngày 19/10/2015 của Giám đốc Sở Nông nghiệp và PTNT Đắk Nông về việc phê duyệt phương án kỹ thuật, dự toán thi công dò tìm, xử lý bom mìn, vật nổ Tiểu dự án: Sửa chữa, nâng cấp công trình thủy lợi Quảng Lộc, thôn 02 Đắk Sin, huyện Đắk R'lấp;

- Quyết định số 547/QĐ-SNN ngày 02/11/2015 của Sở Nông nghiệp và Phát triển nông thôn Đắk Nông về việc phê duyệt chỉ định thầu gói thầu 04-09: Dò tìm, xử lý bom mìn, vật nổ Tiểu dự án: Sửa chữa, nâng cấp công trình thủy lợi Quảng Lộc, thôn 02 Đắk Sin, huyện Đắk R'lấp;

- Hợp đồng số 15/2015/HĐ-XD ngày 02/11/2015 ký giữa Ban Quản lý dự án "Phát triển cơ sở hạ tầng nông thôn phục vụ sản xuất cho các tỉnh Tây Nguyên", tỉnh Đắk Nông với Tổng Công ty xây dựng Trường Sơn về việc dò tìm, xử lý bom mìn, vật nổ Gói thầu 04-09: Dò tìm, xử lý bom mìn, vật nổ Tiểu dự án: Sửa chữa, nâng cấp công trình thủy lợi Quảng Lộc, thôn 02 Đắk Sin, huyện Đắk R'lấp;

- Giấy uỷ quyền số 01/UQ-TCT ngày 02/01/2014 của Tổng giám đốc Tổng công ty XD Trường Sơn;

- Biên bản bàn giao mặt bằng trước khi thi công rà phá bom mìn, vật nổ

- Nhật ký thi công;

- Bản vẽ mặt bằng hoàn công rà phá bom mìn, vật nổ;

- Biên bản nghiệm thu kỹ thuật và kiểm tra chất lượng theo xác suất;

- Biên bản xác nhận số lượng chủng loại bom, đạn vật nổ dò tìm được đem hủy;

- Biên bản hủy bom mìn, vật nổ;

- Cam kết an toàn;

- Báo cáo tổng kết công tác dò tìm xử lý bom mìn, vật nổ;

- Biên bản nghiệm thu khối lượng công việc hoàn thành;

#### **4. Chất lượng và khối lượng hạng mục công trình:**

a. Khối lượng công việc hoàn thành:

Stt	Tên công việc	Dvt	Khối lượng		
			Hợp đồng	Thi công	Nghiệm thu
	<b>Trên cạn</b>				
1	Phát cây dọn mặt bằng tương đương rừng loại 1	Ha	14,30	14,87	14,30
2	Dò tìm BMVN trên cạn đến độ sâu 0,3 m.	Ha	23,84	23,84	23,84
3	Đào, xử lý TH đến độ sâu 0,3m - Đất cấp 1	Th	2.265	2.274	2.265
4	Dò tìm BMVN trên cạn ở từ độ sâu 0,3 đến 5m.	Ha	23,84	23,84	23,84
5	Đào, xử lý TH đến độ sâu 3m - Đất cấp 2	m <sup>3</sup>	199,44	205,51	199,44
6	Đào, xử lý TH đến độ sâu 5m - Đất cấp 2	m <sup>3</sup>	264,06	268,96	264,06

*b. Chất lượng hạng mục công trình:*

- Tuân thủ Quy trình kỹ thuật dò tìm và xử lý bom mìn, vật nổ kèm theo Quyết định số 95/QĐ-BQP ngày 7/8/2003 của Bộ Quốc phòng.

- Thi công đúng quy trình kỹ thuật, đúng tiến độ, đúng nội dung hợp đồng ký kết. Đảm bảo an toàn tuyệt đối trong quá trình thi công.

*c. Tiến độ thi công:*

- Ngày bắt đầu : 08 / 11 / 2015

- Ngày hoàn thành : 13 / 11 / 2015

5. Các ý kiến khác: không.

6. Kết luận:

- Chấp thuận nghiệm thu hoàn thành hạng mục công trình xây dựng để đưa vào sử dụng.

- Khối lượng nghiệm thu làm căn cứ để đơn vị thi công làm hồ sơ thanh quyết toán khối lượng hoàn thành giai đoạn xây dựng.

- Biên bản này được lập thành 10 bản có giá trị pháp lý như nhau. /.

**KT. GIÁM ĐỐC**  
**ĐẠI DIỆN CHỦ ĐẦU TƯ**  
  
  
Nguyễn Minh Sơn

**ĐẠI DIỆN ĐƠN VỊ THI CÔNG**  
  
  
Trưng tá: LÊ VIẾT QUÂN



**Annex 6: Environmental requirements in the bidding documents**

No	Impacts	Mitigation measures	Location
1	Landslide, Soil erosion and increase of sedimentation in flowing water into irrigation canals	<ul style="list-style-type: none"> <li>- Excavation works need to be scheduled to exclude rainy season (from end of May or early June to November) as much as possible.</li> <li>- Split construction section by section to reduce the concentration of materials and extent of excavation and/or embankment.</li> <li>- Material storage areas need to be bounded and covered during rainy times.</li> <li>- Stabilize all slopes, embankments and other erosion-prone working areas while works are proceeding at borrow pit and disposal site.</li> <li>- Re-plant vegetation covering upper parts of slope sections of roads and of weir as soon as possible after excavation and/or embankment works are achieved.</li> <li>- The exploitation of borrow pit need to avoid rainy days that may cause land sliding.</li> <li>- The exploitation of borrow pit need to be dug in subsequent sections to be better control vertically of digging areas.</li> <li>- Not allow heavy machinery or other equipment to be located on the top of digging areas of borrow pit to avoid possible landslide.</li> </ul>	In slope areas of upgraded roads, weir, spillway and canals bed in Dao Nghia, Dak Sin communes
2	Surface water source can be contaminated	<ul style="list-style-type: none"> <li>- Discarded lubricants and/or other chemicals have to be kept in dry covered area.</li> <li>- Discarded lubricants/ chemicals from construction sites need to be collected, transported and treated according to the Circular No. 36/2015-BTNMT of MONRE.</li> <li>- Construction waste &amp; discarded soil needs to be transported by adequate manners to agreed disposal site in Dao Nghia commune.</li> <li>- Provide 04 dustbins and 02 mobile septic tanks at work sites to manage</li> </ul>	Dak Ke'h spring, water surface in Cau Tu & Quang Loc dams in Dao Nghia commune; dam in Village No.2 in Dak Sin communes, other small streams and irrigation canals in downstream of those works

No.	Impacts	Mitigation measures	Location
		<p>wastewater and domestic waste from workers at 02 camps site.</p> <ul style="list-style-type: none"> <li>- Disposal of solid wastes into canals, streams, other watercourses and agricultural fields shall be prohibited through notices in signboards at sites and be enforced by daily patrols by contractors' personnel in all sites.</li> <li>- Contractors must prepare a place to clean/wash tools/vehicles. Washing trucks/vehicles next to water bodies, existing streams such as Dak Ke'h spring, Cau Tu &amp; Quang Loc dams in Dao Nghia commune as well as other surface water bodies nearby will not be permitted.</li> <li>- Locations of 02 worker camps need to be apart from Cau Tu &amp; Quang Loc dams &amp; irrigation canals to avoid water contaminations from domestic waste.</li> <li>- Cover material storage areas if it rains. Temporary storage of constructional and domestic waste on the sites should not last more than 24 hours.</li> </ul>	
3	Noise/vibration	<ul style="list-style-type: none"> <li>- Construction machines and equipment need to meet standards of noise and vibration as regulated by the Government. The Contractor needs to submit the official documents proving that all construction vehicles, equipment, and machines are checked and meet requirements of the current Vietnam standards concerning noise and vibration generated.</li> <li>- Ensure all construction vehicles and equipment are well maintained. Turn off machinery and/or equipment when possible to avoid continuous noise and vibration impacts on workers.</li> <li>- All noise and vibration generating activities shall be avoid during resting time of local people (12-13h and 20h – 6h) along the upgraded roads and canals in Dao Nghia &amp; Dak Sin communes.</li> <li>- Provide ear protective equipment (ear plug/ear muff) for workers working in</li> </ul>	Residential areas in connecting roads with Dak Sin & Dao Nghia communes; borrow pit in Dao Nghia commune, Quang Loc irrigation works & irrigation works systems in Dak Sin commune

No.	Impacts	Mitigation measures	Location
		<p>high noise conditions generated by machinery and/or equipment and allow for reasonable time-off from work when they are exposed to excessively long periods to noise and vibrations, as required in Decision 3733/2002 of Ministry of Health.</p> <ul style="list-style-type: none"> <li>- The travelling of trucks, which serve for transporting materials and waste, will be scheduled to reduce accumulation of noise sources;</li> <li>- Detailed construction schedule needs to be publicly announced by the contractor to local people (on the notice boards of Dao Nghia &amp; Dak Sin communes) so that they can arrange their activities and stay away from working sites and noise and vibrations.</li> </ul>	
4	Air pollution caused by machines and vehicles (dust and gas emissions)	<ul style="list-style-type: none"> <li>- Covering trucks and transportation vehicles to minimize dust generated when transporting materials and waste.</li> <li>- The use of construction materials need to be properly planned to limit as much as possible the volume of quantities stored on the sites.</li> <li>- Watering practices, to minimize dust generation, need to be implemented for roads and working sites, which are close to residential areas, such as Quang Thanh, Quang Tho, Quang Phuoc, Quang Chanh, Quang Loc, Quang An &amp; Quang Dat villages of Dao Nghia commune, and Villages 1, 2, 3, 4, 5, 10 &amp; 13 of Dak Sin commune. The watering activities have been proposed to be carried out at least once per day during rainy season and twice per day during dry season in working areas.</li> <li>- Equipment/vehicles have to be verified and licensed. Specifically, transporting vehicles need to meet the standards related to exhaust emissions as regulated by Government and according to Decision 249/2005 of the Prime Minister about emission of transportation vehicles in the territory.</li> </ul>	Residential areas in connecting roads with Dak Sin & Dao Nghia communes; borrow pit in Dao Nghia commune, Quang Loc irrigation works & irrigation works systems in Dak Sin commune

No	Impacts	Mitigation measures	Location
		<ul style="list-style-type: none"> <li>- Equipment and machines will not be allowed to move outside of construction sites to ensure control of emission sources.</li> <li>- Materials or soil are falling on the paved roads and public roads shall be cleaned immediately.</li> <li>- All material/waste storages shall be located away from any households and sensitive areas.</li> </ul>	
5	Soil contamination	<ul style="list-style-type: none"> <li>- Cover material storage areas and handle chemicals and wastes to ensure that construction materials and/or wastes could not fall into agricultural land in the subproject areas.</li> <li>- Discarded lubricants and/or chemicals must be kept in dry and covered area.</li> <li>- Toxic/hazardous waste, if any, need to be collected, transported and treated according to Circular No. 36.2015/BTNMT of MONRE.</li> <li>- Regularly collect solid wastes and transport these to disposal site where had agreed with local authorities of Dao Nghia commune. To eliminate diseases and landscape, solid waste need to be dumped and covered by lime and covered by soil layer.</li> <li>- Provide 04 dustbins and 02 mobile septic tanks in all construction sites and worker camps.</li> <li>- Wastewater from worker camps needs to be collected and treated initially by mobile septic tanks before discarded to environment.</li> </ul>	02 worker camps, embankment sites in irrigation works systems of Quang Loc, Dak Sin, disposal site & borrow pit in Dao Nghia commune; upgraded roads, in Dao Nghia, Dak Sin communes
6	Local flooding	<ul style="list-style-type: none"> <li>- Set up appropriate construction schedule to avoid rainy season, especially for excavation activities. This has been strictly applied for excavation, embankment and construction of Quang Loc weir, and irrigation canals.</li> <li>- Manage storage of materials and/or wastes to avoid them falling into water flows in irrigation canals as well as</li> </ul>	The surrounding areas upgraded and construction roads and irrigation works in Dak Sin and Dao Nghia communes

No	Impacts	Mitigation measures	Location
		blocking intakes and culverts. - Regularly check water flow situation of canals, intakes, culverts and removing materials/waste that block water flow. - Place equipment to wash instruments/ vehicles/ tools next to the spring, streams, existing canals will not allowed such as Dak Ke'h spring, and Quang Loc, Dak Sin reservoirs.	
7	Unsafe for travelling and business during the road construction (Traffic safety)	- Install traffic signals at construction sites to regulate and minimize speed of vehicles or panels warning of areas under construction, especially at the roads' intersections. - Install lamps at night at construction sites. - Inform the community about construction schedule through informal public consultation or at any local people meetings and display related information on noticeboards of Dao Nghia & Dak Sin communes. - Construction activities should be done by section sequences to minimize temporary occupation of areas along the roads. - Train drivers of sub-project as well as worker to work respecting safety rules and warning people passing nearby the construction sites. - Appoint at least 01 worker to be responsible in monitoring the inflow and outflow of vehicles to and from construction sites as well as warning people to ensure traffic safety.	Along the constructed roads and on dam crest; communities using such constructed roads and dam crest for travelling in Dak Sin, Dao Nghia communes
8	Impact on terrestrial ecology	- Only cutting down of private trees, vegetation and agricultural plants that has been taken into account in compensation plans. - Any cut plants and/or damaged fields, which are out of ROW, will be compensated according to voluntary agreement. - Re-plant vegetable cover section by	Along the 05 upgraded roads, borrow pit & disposal site in Dao Nghia commune and irrigation works system of Quang Loc of Dao Nghia Commune & Dak Sin Commune

No.	Impacts	Mitigation measures	Location
		section after construction work completed to return landscape in its original condition.	
9	Impact by solid wastes	<ul style="list-style-type: none"> <li>- Residual volume of soil (approximate 15,000 m<sup>3</sup>) will be transferred to disposal site agreed with Dao Nghia CPC commune.</li> <li>- In case that local people ask excavated soil for their house, the agreement between local HHs, contractors and local authorities need to be obtained.</li> <li>- Construction contractor needs to collect solid waste weekly and dump solid waste with a layer of lime &amp; soil layer to ensure sanitary of local.</li> <li>- Equip 04 dustbins and 02 mobile septic tanks to work sites for waste collections and treatment.</li> <li>- Disposal of solid wastes into canals, stream, other watercourses, agricultural field and public areas shall be prohibited.</li> <li>- Burning of construction and domestic wastes shall be prohibited.</li> </ul>	All sub-project construction and 02 camp sites in Dao Nghia & Dak Sin communes
10	Impacts to existing infrastructure	<ul style="list-style-type: none"> <li>- Work with existing infrastructure owners (electricity, water...) to identify locations of underground components if any.</li> <li>- Obtain agreement with local authorities in using the transport routes.</li> <li>- Any public facilities, which are damaged during sub-project activities, need to be fully repaired and recovered to their original conditions by the contractor.</li> <li>- Load capacity of trucks should not exceed local bridges /roads' load design (weight of loaded truck utilized to be lower than 10 tons, depending on the designed load of bridge/road).</li> <li>- After construction completion, all public facilities must be re-checked to ensure their functions not being affected by sub-project activities. If any damage has been identified besides normal wear and tear, contractor will be responsible for repairing the damaged structures to their</li> </ul>	All roads/sluices or bridges around the sub-project area

No	Impacts	Mitigation measures	Location
		original conditions and compensate for damages that cannot be recovered.	
11	Disturbance to local people's life due to crowded workers	<ul style="list-style-type: none"> <li>- Recruitment of worker should prioritize local workers.</li> <li>- Register provisional residence for workers temporary living in the 02 camps.</li> <li>- Contractor needs to regulate camp sanitation system.</li> <li>- Carry out HIV/AIDS and sex transmission infection prevention program. All workers should attend the training organized by the Project.</li> <li>- Propagate and raise awareness of the construction workers to maintain discipline, habits and customs and create good relationships with local people, reduce social evils.</li> <li>- Contractors need to be encouraged to organize provision of meals for all workers at each site to ensure hygiene and food safety.</li> <li>- Spray insecticides at 02 worker camps.</li> <li>- Train and guide labor safety measures and prevention of common diseases for workers.</li> </ul>	Dak Sin & Dao Nghia communes
12	Risks to health and safety to local people and workers	<ul style="list-style-type: none"> <li>- Construction contractor needs to register number of labor working for sub-project to local authority.</li> <li>- Regularly testing workers' health against infectious diseases as regulated by Ministry of Labor.</li> <li>- Provide sufficient labor safety equipment (PPEs) to workers such as safety shoes, helmets, harness etc. Instruct workers how to use and monitor their regular use to ensure compliance.</li> <li>- A first aid kit will be provided at each construction site to ensure patients can receive first aid timely before transporting them to the medical station/hospital. Collaborate with Dao Nghia &amp; Dak Sin communes' clinic centers to</li> </ul>	Construction sites, upgraded works of Dao Nghia & Dak Sin communes; borrow pit and 02 worker camps of sub-project



No.	Impacts	Mitigation measures	Location
		<p>receive additional support.</p> <ul style="list-style-type: none"> <li>- Install power network at site in accordance with official safety regulations to ensure that power lines are safe and that power connections to grid or generators are located at dry and safe places.</li> <li>- Install warning signs at the electric receptacles.</li> <li>- Display information panels about the project, the labor regulations at sites.</li> <li>- Install fences, warning signs at the intersection between the drains/canals and roads.</li> <li>- Keep the light switched on during the night time at all construction sites.</li> <li>- Construct temporary drainage ditches to drain water from the sites, prevent any possible water logging.</li> <li>- Prepare emergency alerts and remedy intervention for any occurrence during construction activities such as fire, flooding or other unforeseen event.</li> </ul>	
13	Impacts around the pits, of, and stone sand	<ul style="list-style-type: none"> <li>- The soil will be excavated from borrow pit in Dao Nghia commune thus no need to transfer in long distance (0.5 – 5 km). During soil excavation, mitigation measures to environment needs to be implemented as following: <ul style="list-style-type: none"> <li>▪ Exploit section by section to avoid excessive dust generation and landslides.</li> <li>▪ Prepare recovery plan for exploited areas.</li> <li>▪ Workers in quarry have to have PPEs and should follow proper safety guidelines.</li> <li>▪ Vehicles' bed need to be covered to avoid dust &amp; solid waste dropping on the roads.</li> <li>▪ Nighttime transportation need to be</li> </ul> </li> </ul>	Borrow pit in Dao Nghia commune, other mines and along the transport routes



No.	Impacts	Mitigation measures	Location
		<p>minimized to avoid traffic accidents possibly due to poor nighttime visibility, and to avoid noise generated in resting time for local residents.</p> <ul style="list-style-type: none"> <li>- The stone and sand materials will be purchased from town centers (20 – 40 km) where environmental issues are controlled and mitigated by local authorities and mines' owners. Thus construction contractor need to check license and environmental mitigation measures of such quarries.</li> </ul>	
14	Impact on existing irrigation systems	<ul style="list-style-type: none"> <li>- The construction of irrigation system must be scheduled and planned considering water availability for fields. Those plans need to be agreed with Dak Nong &amp; Dak R'lap DARDs, Dao Nghia &amp; Dak Sin communes and displayed to local residents on noticeboards.</li> <li>- Contractors need to apply adequate measures to ensure that irrigated fields, nearby and in downstream of Quang Loc dam, will not be deprived of needed water.</li> <li>- The diversion flow method will be applied during upgrading and constructing Quang Loc dam and irrigation canals to ensure water availability for irrigation (Winter – Spring and Summer – Autumn crops) during construction phase.</li> <li>- Construction need to implemented in subsequent section to minimize impacts as whole.</li> </ul>	Quang Loc dam & irrigation works in Dao Nghia & Dak Sin communes
		<ul style="list-style-type: none"> <li>- The construction plans need to be reviewed and agreed with Dak Nong &amp; Dak R'lap DARDs, Dao Nghia &amp; Dak Sin communes and displayed in noticeboards of such communes, especially the withdrawing water plan of Quang Loc dam, and blocking canals during construction.</li> <li>- For road component: Construction should be completed in subsequent sections to</li> </ul>	

No	Impacts	Mitigation measures	Location
15	Impact on surrounding agricultural land and cultivation activities	<p>ensure that local traffic will not be disrupted. The transportation network in sub-project is quite good and convenient, thus during construction period, the traffic distribution method should be established and having traffic guides to local peoples, who travelling on routes nearby.</p> <ul style="list-style-type: none"> <li>- Dam crest of Quang Loc is used as transportation road, thus during construction period, not allow local people using this road and guide locals use bypass road in Village 1 of Dak Sin (distance about 3 km).</li> <li>- For constructing irrigation canals: construction plans need to ensure water supply for irrigated fields. The constructed sections will be blocked in both endings and water will be diversified through these sections by pipes, which will be located in both sides of canals. The order of construction will be from upstream to downstream.</li> <li>- Any negative impact to irrigated fields, occurring during construction period, needs to be adequately compensated.</li> </ul>	Areas surrounding Quang Loc dam and agricultural areas in Dao Nghia, Dak Sin communes
16	Cultural objects or graves found	<ul style="list-style-type: none"> <li>- If any cultural object and/or grave is found during construction, the construction activities at those places need to be temporarily stopped and local authorities should be immediately informed of the findings to deal with the issue.</li> <li>- Proper forms of compensation need to be taken after consultation with affected HHs suffering from any impact on their graves. The construction contractor has to provide necessary support to these HHs to resettle graves elsewhere or to local communes for cultural objects found</li> </ul>	Potential in construction areas in Dao Nghia & Dak Sin communes
17	Environmental recovery activities	<ul style="list-style-type: none"> <li>- During construction, any damage to local infrastructures will be compensated and mitigated by construction contractor as mentioned above.</li> <li>- The environmental issues emerged during recovery activities such as noise, dust, gases, solid waste, hazardous waste, wastewater will be handled with</li> </ul>	Quang Loc dam, new canal construction areas, along upgraded roads

No.	Impacts	Mitigation measures	Location
		<p>similar measures indicated in related sections above.</p> <ul style="list-style-type: none"> <li>- Re-plant cutting plants &amp; trees after completing construction activities.</li> <li>- Repair damaged infrastructures as soon as possible.</li> <li>- Restore water flow into upgraded canals as soon as possible to recover aqua-ecosystem.</li> <li>- Flow water into Quang Loc dam and protect areas from fishing activities to recover aqua-ecosystem.</li> </ul>	