Initial Environmental Examination

October, 2013

VIE: UPGRADING SALOUN RESERVOIR AND IRRIGATION SYSTEM SUBPROJECT BINH THUAN PROVINCE

Prepared by Central Project Management Unit – Agriculture Project Management Board – Ministry of Agriculture & Rural Development for the Asian Development Bank.
This is an {updated} {revised} version of the draft originally posted in {Month Year} available on {http://www.adb.org/projects/xxxxx-xxx/documents}.}

CURRENCY EQUIVALENTS

(as of 20 September 2013)

Currency unit	–	Vietnamese Dong (VND)
VND 1.00	=	$ 0.000047
$1.00	=	VND 21,080

ABBREVIATIONS

ADB	-	Asian Development Bank
CEP	-	Commitment on Environmental Protection
CPC	-	Communal People's committee
CPMU	-	Central Project Management Unit
CSB	-	Commune Supervision Board
DARD	-	Department of Agriculture and Rural Development
DONRE	-	Department of Natural Resources and Environment
DPC	-	District Peoples Committee
EIAR	-	Environmental Impact Assessment Report
EMP	-	Environmental Management Plan
IEE	-	Initial Environmental Examination
IMC	-	Independent Monitoring Consultant
IRDPCP	-	Integrated Rural Development Project in Central Provinces
MARD	-	Ministry of Agriculture and Rural Development
MONRE	-	Ministry of Natural Resources and Environment
PC	-	Peoples Committee
PPC	-	Provincial Peoples Committee
PMU	-	Project Management Unit
PPMU	-	Provincial Project Management Unit
SST	-	Subproject Support Team
TOR	-	Term of References
UXO	-	Unexploded Ordnance

NOTE{S}

(i) In this report, "$" refers to US dollars.

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I. INTRODUCTION

1. The Integrated Rural Development Sector Project in the Central Provinces (IRDPCP) is being implemented through a sector loan from the Asian Development Bank (ADB). The Ministry of Agriculture and Rural Development (MARD) is the executing agency for the sector loan.

2. Due to the success of the project, as request from the government the ADB provides Additional Financing of $70 million for a second phase of the project which will be implemented in 6 of the original 13 provinces. The IRDSPCP 2nd phase is located in 6 provinces in central Viet Nam and has involved construction of medium scale rural infrastructure of the following types:

(1) Irrigation, drainage and flood control infrastructure including river embankments, sluices and salinity intrusion control structures;
(2) Rural roads including bridges and culverts.

3. As part of IRDPCP 2nd phase, Upgrading Saloun reservoir and irrigation system subproject will be constructed in Dong Giang commune, Ham Thuan Bac district, Binh Thuan province.

4. This Initial Environmental Examination/Commitment on Environmental Protection (IEE/CEP) document has been prepared to meet the environmental safeguards requirements of the ADB[1] and GOV[2]. The IEE/CEP contains the following information:

(1) Section I Introduction
(2) Section II contains a description of the subproject;
(3) Section III contains a description of environmental conditions in the vicinity of the subproject;
(4) Section IV contains a describes potential environmental impacts of the subproject;
(5) Section V contains the environmental management plan including mitigation measures, monitoring system and cost estimation for the implementation of Environmental Monitoring System;
(6) Section VI contains activities description on community consultation and subproject disclosure;
(7) Section VII contains conclusion and recommendation including summarization of main impacts and typical mitigation measures in the subproject's implementation.

[1] ADB Safeguard Policy Statement (2009)
[2] Law on Environment Protection (Revised) 2006; Decree 29/2011/NĐ-CP dated April, 18th 2011 and circular No. 26/2011/TT-BTNMT dated July, 18th 2011

II. PROJECT DESCRIPTION

Table 1: General information of subproject

DATA ITEM	SUBPROJECT DATA
GENERAL INFORMATION	
Subproject Name	Saloun irrigation system upgrading Subproject, Ham Thuan Bac district
Subproject Type	Irrigation
Project owner	DARD of Binh Thuan Province
Address of Project owner	Km 1700, national road 1 A, Ham Thang commune, Ham Thuan Bac district, Binh Thuan province
Name and Title of Head of Project owner	Mr. Vo Xuan Huynh Title : Director
Telephone, fax and email details of PPMU	Tel: (0623).839174; FAX : 0623. 839174
SUBPROJECT DESCRIPTION	
New project or rehabilitation project	Upgrading and improvement
Technical standard for irrigation canal	Irrigation canal is grade IV of technical standard QCVN 04-05:2012/BNNPTNT
Design Irrigation Frequency	Irrigation frequency at the fields surface: q =1.06l/s-ha, which and guarantees: P=85%. Pursuant to the Document No. 510/BNN-TL dated 06/3/2009
Surface and underground water	Surface water
Identification of water source	Saloun reservoir.
Water source used for living or not?	No
Area to be irrigated	421ha of cultivated land area of Dong Giang commune
Saloun reservoir upgrading	To increase active surface area of the reservoir by dredging approximately 3750 m^2 and clean up the reservoir. It is expected to increase active volume of the Saloun reservoir in 6%
The length of upgrading canal	The main canal that connect the reservoir with existing main canal have to construct to reduce water losses via Saloun dam Main canal: 1360 m have to upgrade Primary canal Canal N2: 2657 m to be upgraded Canal N4: 2565 m to be upgraded Canal N6: 1960 m to be upgraded Secondary canal: new Canal N2: 3272 m Canal N4: 3901 m
The width and depth of upgrading canal	Cross surface is rectangular with dimension of Main canal: WxH = 0.7-1.0 m x 0.58 – 0.6 m Canal N2: WxH = 0.5-0.7 m x 0.27 – 0.53 m Canal N4: WxH = 0.6-0.8 m x 0.28 – 0.56 m Canal N6: WxH = 0.5-0.6 m x 0.24 – 0.36 m
Structures on canal	concrete
The width and length of approach road	The production road will be upgraded: 2965 m from Dong Giang – Da Mi road to Saloun dam

<table>
<tr><th>DATA ITEM</th><th>SUBPROJECT DATA</th></tr>
<tr><td>Climate change</td><td>In accordance with prediction of MONRE (2012):
- Tthe project area is not subject to sea water level raising.
- In comparison with rainfall in period 1980-1999:
+ The annual rainfall will increase 0.5%-0.7% by the year of 2020 and 0.8%-0.9% in year of 2030;
+ The rainfall during dry season will decrease 0.9%-3.4% by the year of 2020 and 1.4%-5% in 2030;
+ The rainfall during wet season will increase 0.3%-2.0% by the year of 2020 and 0.4%-2.8% in 2030.
Or the marginal changes of rainfall is not much in the project area therefore the active volume of Saloun reservoir can compensate it.</td></tr>
<tr><td colspan="2">CONSTRUCTION ACTIVITIES</td></tr>
<tr><td>Construction commencement date (month/year)</td><td>The construction work is expected to be commenced in October, 2015</td></tr>
<tr><td>Construction completion date (month/year)</td><td>The construction phase of the sub-project is expected to completed by the end of August, 2016</td></tr>
<tr><td>Number of construction workers</td><td>Approximately 4 teams will working in parallel for the subproject:
- Team No.1: do upgrade the Saloun reservoir (about 13 workers); After finishing this job this team will do upgrade canal N 2.
- Team No. 2: do upgrade the main canal and road from Dong Giang commune to Saloun reservoir (about 15 workers);
- Team No.3: do upgrade the canal N4 (about 15 workers); and
- Team No.4: do upgrade the ca</td></tr>
<tr><td>Construction camp required (Yes/No)</td><td>Yes. There is will be 6 worker based camps, with area of 50 m^2/camp, for 6 teams</td></tr>
<tr><td>Construction in rainy season (Yes/No)</td><td>In case of favorable weather conditions</td></tr>
<tr><td>Number and conditions construction vehicles and equipment</td><td>Main vehicles will use for construction are as follow:
Trucks: 7 , Bulldozer: 3, excavator: 5 and Roller: 3
The equipments: mixers for concrete: 6, and hand vibrators: 12-15.</td></tr>
<tr><td>Location and square of disposal site and sources of materials</td><td><u>Permanent disposal site for excess soils: large</u> borrow pit, that left from previous construction <u>in the Dong Giang commune</u>
<u>Temporary gathering site:</u>
Along site has some wild areas of project commune where use for gathering material. This does not affect residential area
<u>Sources of materials for construction:</u>
- Red gravel is planned to buy from the mining site, which is about 7 km far from the subproject site;
- Gravel and stone for construction – buy from Tazone Quarry which is about 45 km far from the subproject site;
- Sand for construction is planned to buy from the mining site nearby Song Do bridge – Dong Tien commune, which is approximately 12 km far from the subproject site;
- Other material (cement, iron, steel) is from Phan Thiet city which is approximately 50 km far from the site.</td></tr>
<tr><td>Quantity of excavated soil and
Balancing and management measures for excavated/excess soil</td><td>The balance of excavated soil
<table>
<tr><th>Item</th><th>Excavated (m^3)</th><th>Backfill (m^3)</th><th>Balance (m^3)</th></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>DATA ITEM</th><th>SUBPROJECT DATA</th></tr>
<tr><td></td><td>
<table>
<tr><td>Road to Saloun reservoir</td><td>760</td><td>760</td><td>0</td></tr>
<tr><td>Main canal</td><td>2500</td><td>1200</td><td>+1300</td></tr>
<tr><td>Canal N2</td><td>9600</td><td>6300</td><td>+3600</td></tr>
<tr><td>Canal N4</td><td>12500</td><td>8300</td><td>+4200</td></tr>
<tr><td>Canal N6</td><td>4500</td><td>2500</td><td>+2000</td></tr>
<tr><td>Secondary canals</td><td>2691.9</td><td>3888.3</td><td>- 1196.4</td></tr>
<tr><td>Total</td><td>32551.9</td><td>22948.3</td><td>+9603.6</td></tr>
</table>
The excavated soil will be used for upgrading of Road to Saloun reservoir and production road along the canal system
The excess soil will be used for backfill of borrow pit, that left from previous construction</td></tr>
<tr><td>Quantity of construction materials</td><td>
<table>
<tr><td>Item</td><td>Unit</td><td>Quantity</td></tr>
<tr><td>Cement</td><td>Ton</td><td>1678.5</td></tr>
<tr><td>Sands</td><td>m^3</td><td>2954</td></tr>
<tr><td>Gravel/stone</td><td>m^3</td><td>5314</td></tr>
<tr><td>Gravel for road construction</td><td>m^3</td><td>1350</td></tr>
<tr><td>Steels</td><td>Ton</td><td>373.5</td></tr>
<tr><td>Coffras (ván copha)</td><td>m^2</td><td>21897</td></tr>
</table>
</td></tr>
<tr><td colspan="2">OPERATION AND MAINTENANCE ACTIVITIES</td></tr>
<tr><td>Design Capacity at main canal : (m3/s)</td><td>0.53-0.58 m^3/s</td></tr>
<tr><td>Subproject irrigated area (ha)</td><td>Increasing from 70 ha to 421ha</td></tr>
<tr><td>Cycle of water treatment</td><td>No. Water source from Saloun reservoir has been using for irrigation purpose. Currently, there is no cycle of water treatment. The potential water pollution source is mainly from rubber plantation around the reservoir. The total area of rubber plantation is 20 ha.</td></tr>
<tr><td>Periodically time for maintenance activities</td><td>1/year</td></tr>
<tr><td>Maintenance activities</td><td>Every year, Binh Thuan Irrigation management Company under Binh Thuan department of Agriculture and Rural development has managed the irrigation works. The agency is responsible for operation and maintenance works after complement.
(i) Regular operate and maintain:
Carry out regularly to minimize broken for works, including: drainage canal heart, do clearance, repair temporary broken, maintain exhaust and paint for mechanical equipment
(ii) Periodically operate and maintain
Carry out for broken and downgraded section to restore works item. Displace mechanic items and repair broken, carry out dredging and maintain canal side.
Frequency: twice/ a year
(iii) Operation and maintenance in case of emergency: carry out repair for broken and downgraded items. Carry out check, propose technical method and cost for repairing based on current regulation of State.</td></tr>
<tr><td>Responsibility for Operation and</td><td>DARD is the functional manager of operation and maintenance</td></tr>
</table>

DATA ITEM	SUBPROJECT DATA	
Maintenance	activities; Binh Thuan Irrigation Works Exploitation Company (IWECO) is a state-owned enterprise which is responsible for managing, operating and maintaining the construction work after its completion; Ham Thuan Bac Irrigation Enterprise is the direct O&M agency	
RESETTLEMENT AND LAND ACQUISITION [3]		
Number of Affected households	There are 53 household will be affected by project implementation. Among them about 27 household will be affected from 3.37% to 8.98% of agricultural land and 26 household from 0.08% to 3.37%.	
Number of severely affected person	Nil	
Number of APs that must relocate	Nil	
Total land area to be acquired	Temporary-?	Permanent –30,907 m^2
) Agricultural land area to be acquired (ha)	Temporary-Nil	Permanent –27,323 m^2
Forestry land area to be acquired (ha)	Temporary-Nil	Permanent -Nil
Garden land to be acquired (ha)	Temporary-Nil	Permanent -Nil
Aqua-cultural land to be acquired (ha)		
Residential land to be acquired(ha)	Temporary-Nil	Permanent -Nil
Other land to be acquired (ha)		Permanent – 3,584 m2, the land under right of the People Committee of the Dong Giang commune.
SUBPROJECT COST		
Total subproject cost (VND and $USD)	52,821,319,299 VND (equivalent to 2,515,301 USD, with the exchange rate of 1USD= 21,000 VND	

[3] This data is obtained from Resettlement Plan

Figure 1: Location of Subproject

III. DESCRIPTION OF EXISTING ENVIRONMENT

Table 2: Environmental baseline

DATA ITEM	SUBPROJECT DATA
PROJECT LOCATION	
Commune(s):	Dong Giang
District:	Ham Thuan Bac
Province:	Binh Thuan
Geographic location:	North latitude: 11^0 10'50" to 11^0 36'28" East longtitude:107^0 58'37" to 108^0 15' 02"
NATURAL ENVIRONMENT CONDITIONS	
Air quality	Population density in subproject area is low, with 28person/km^2. In general, the impact level is minor. Surrounding upgrading canal area is a plain , thinly population density, nil construction activities and air pollution is low, mostly is from commune transportation activities. In subproject area, there is no sign of high dust pollution. In dry season, dust is generated from passing vehicles.

DATA ITEM	SUBPROJECT DATA
Noise and vibration	Because of rural area, noise and vibration is very low, Noise level in the subproject area is low and there is nil impact on local people.
Climate and natural disasters	The climate in subproject area is located Middle-South of Vietnam. The climate is typical semi-draught in the middle-South of Vietnam and mountain area. The climate divided into two distinguished seasons: The rainy season begins May and lasting to October, rainfall volume yearly accounts for 81.2-96% of year rainfall volume[4]. The dry season normally lasting from November to April, in which normally there is nil rainfall in Feb, Jan and March. The main data on climate condition in Ham Thuan Bac district : - Average temperature is 26.7^{0}C, highest temperature is 40^{0}C and lowest temperature is 14^{0}C; - Average rainfall: 1,300mm, highest rainfall is 1,500mm and lowest rainfall is 800mm. The local rainy season is from May to October, and dry season is from November to April. - Average humidity: 74.03%. Average annual sunny hours: 2,280 hours (190 days). This is an advantage the growth of plants and crops, which brings high yield. The local climate is rather favorable for cultivation. Low humidity will facilitate the reservation of agro-products. The meteorology-hydrology data of Binh Thuan Centre indicate there are 4-6 storms annually in the subproject area with heavy rainfall.
Topography and soils	Subproject area is generally flat, with elevations ranging from 300 m to 315 m above sea level. Soil: the top soil layer with 0.5-1.5m thick. Main type of soil are loam, clay, some sections have both aluvi- and clay and stones
Water bodies	There is no river running through the project area. The Saloun reservoir was constructed by compensation budget from the Ham Thuan - Da My hydropower project, invested by the Hydropower PMU No.6. The work was constructed in 2000, completed and handed over in 2002, and in 2008, its spillway was upgraded into a fuse-gate one. Saloun reservoir is constructed on Saloun stream, which is a small tributary of La Nga river
Groundwater	+ Groundwater in the sub-project area is deep level, more than 5 m in comparison with natural land; Water level is based on season: dry season, ground water is low, more than 7 m in comparison with natural land rainy season, it is from 5.0 to 7.0 meter deep; Local people use ground water via dredged well + Consultation result presents subproject has good ground water Rate of households with access to safe water in the sub-project commune: 100% (mainly from drilling wells, dredging wells)
Water quality	There has been no sign of pollution by lubricating oil, sediment or rubbish; The population using ground water for drinking purpose. Water quality of the Saloun stream in the project area is good and can serve for irrigation purpose.
Flooding	Flooding occurs twice a year (September and October), however, Saloun reservoir canal located along hill through high topography. Thus, subproject does not affect by flood.
Terrestrial flora and fauna	Terrestrial flora: mainly rice field and fruits and vegetables gardens in residential areas; Wild flora is mainly distributed in mountains. There are plants, bush but no valuable and rare trees are available in this area. + Terrestrial fauna: - Wild animals live on field, including some reptile kinds (python, snake), small beasts like rats, etc.. - Animals like buffalo, cow, pig, chicken, ducks, etc. +Terrestrial flora and fauna in subproject area are not listed in Vietnam's Red

[4] Based on statistical data of Phan Thiet Meteorological Station in period 2005-2011

<table>
<tr><th>DATA ITEM</th><th>SUBPROJECT DATA</th></tr>
<tr><td></td><td>Data Book.</td></tr>
<tr><td>Aquatic flora and fauna</td><td>Aquatic product include freshwater fish in Saloun reservoir.;
Aquatic flora and fauna in subproject area are not listed in Vietnam's Red Data Book .</td></tr>
<tr><td>Protected areas</td><td>There is no protected area in the subproject area.</td></tr>
<tr><td colspan="2">SOCIAL ECONOMIC CONDITIONS</td></tr>
<tr><td>UXO</td><td>Canal have been constructed based on the existing route, currently, there is no possibility of UXO
For those part of extending canals there are possibility of UXO.</td></tr>
<tr><td>Land use</td><td>
<table>
<tr><td>Dong Giang commune has a natural land area of 8.852 ha, of which: Type of land use</td><td>Area (ha)</td><td>Ratio (%)</td></tr>
<tr><td>Agricultural land</td><td>850</td><td>9.6</td></tr>
<tr><td>Forest land</td><td>7359</td><td>83.2</td></tr>
<tr><td>land for specific use, residential land and unused land</td><td>643</td><td>7.3</td></tr>
</table>
</td></tr>
<tr><td>Nearest residential land</td><td>Upgrading canal goes through residential land of Dong Giang commune. Nearest distance is about 500 meters.</td></tr>
<tr><td>Rural infrastructure</td><td>System of roads in subproject area connects 28B road with the villages and the canal, which makes condition for traffic and economic exchange
there is a gravel road from Saloun reservoir to the commune bituminous macadam road leading to the center of Dong Giang commune and other interior roads which is convenient for transportation of materials, equipment to the construction sit
In the subproject area, the education infrastructures are completed, Trading infrastructures are relatively developed with small and large scale markets.
Based on the 2012 yearbook, 100% of the households living in Dong Giang commune is using safe water, mainly from wells.
98% of the local households have access to electricity</td></tr>
<tr><td>Agriculture and aquaculture</td><td>+ Agriculture: mainly plant rice, bean and other crop tree;
+ Aquaculture: Nil</td></tr>
<tr><td>Population</td><td>Subproject area includes only Dong Giang commune with total population of 2464 person (633 households).
Male: 50.08%, female: 49.92%</td></tr>
<tr><td>Ethnic minorities</td><td>K'Ho: 80.5% %, Kinh: 5.8%, Ja giai: 8.8% , Cham:3.8% and Nung, Tay, Raglay: 1.1%</td></tr>
<tr><td>Livelihoods</td><td>+ According to annual statistic in 2012 of Ham Thuan Bac district, currently, has 33.97% households living below poverty level, it is should be underlined that the poor rate was decrease from 24.44% in 2008 to 12.88% in year of 2010 but it increased dramatically to 39.34% in year of 2011; Meanwhile the average rate in Ham Thuan Bac district was 10.13% in year of 2011 and 8.01% in year of 2012, female headed household and handicapped person. Mostly handicapped person lives below poverty line.
+ About 70% population in subproject earn living from agriculture production and service, but, the square of productive land is small (average 3,450 m^2/ per person), average income is about 10 millions of VND/ person/per year meanwhile the average income of Ham Thuan Bac district is about 20 millions of VND/ person/per year
+ In addition to agriculture production, local people earns living from husbandry, such as pig, cow, buffalo chicken and duck… and other service, including: good exchange, agriculture product, forestry, rubber plantation… to improve their life and income.</td></tr>
<tr><td>Physical and cultural heritage</td><td>The sub-project area has nil religious structures.</td></tr>
<tr><td>Public health</td><td>Public health is good, from province to district/commune. Commune health station implemented health care well. Commune health stations and district general hospital have been invested significantly, which improve the health of</td></tr>
</table>

DATA ITEM	SUBPROJECT DATA
	local people. Rate of malnourished children is controlled but still high in Dong Giang commune (26.31% of children below 5 years old are below average weight). Diseases which often occur in the summer are diarrhea, dengue fever. Besides, there are respiratory diseases like sore throat, sinusitis

IV. ENVIRONMENTAL IMPACT SCREENING

Table 3: Environmental impact screening

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	IS IMPACT LIKELY TO OCCUR YES / NO?	IS IT MINOR OR SIGNIFICANT?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Pre-Construction Stage Impacts					
Protection forest being cleared for rubber plantation	YES	Minor	Negative	Potentially permanent	Recently some area in Dong Giang commune, including the area in upstream of Saloun reservoir, had been give to Son Trang Rubber Company for planting rubber trees. The total area had been cleared for rubber plantation is 20 ha; is very small in comparison with area of 12 km^2 of Saloun Reservoir catchment (1.67% only). If the area for planting rubber trees will enlarge the potential negative impacts on Saloun reservoir shall likely very high.
Increasing siltation of Saloun reservoir due to erosion from rubber plantation	YES	Significant	Negative	Permanent	Recently the rubber plantation area is 20 ha and 2 year ages therefore during 3-4 years from 2013 there is high potential of soil erosion and causing siltation of Saloun reservoir. When rubber trees reach 6 years the soil erosion rate will be decreasing gradually (See Annex 1 for detailed)
Contamination of Saloun reservoir water due to washing off agrochemicals from rubber plantation around reservoir	No	Minor	Neutral	Permanent	Threat on sustainability of Saloun reservoir: Water contamination of fertilizers and fungicides from rubber plantation; But the impact level is minor and can be negligible (See Annex 1 for detailed)
The risk associated with broken of main dam	NO				The subproject has three components: (1) upgrading the main dam of saloun reservoir, (2) upgrading production raod to main dam and (3) most important component is to upgrade the canl system. The initially an option for incarese the height of main dam had been proposed. But after discussion the proposal was rejected and an alternative, increase active surface of the reservoir, has been

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	IS IMPACT LIKELY TO OCCUR YES / NO?	IS IT MINOR OR SIGNIFICANT?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
					propose Upgrading of Saloun irrigation system will not affected to main dam
Disturbance of UXO	YES	Significant	Negative	Temporary	The road is being upgraded on the existing route. The subproject area is located in rural area where there are cultivation and residential areas. Therefore, there will be no possibility of UXO. However, in the area where canals will extend the is possibility of UXO due to the fact that it is the former battle field during war time.
Effects on households from loss of agricultural land	YES	It is minor; the agricultural to be acquired for construction of canals system is	Negative	Permanent	The road is being upgraded on the existing route. The subproject area is located in public land, thus, there is nil land acquisition. The extension of canals N4, N6 and N2 will need some land acquisition. It is a agricultural land.
Effects on households from loss of residential land	NO	No impacts			The are no residents living along the construction routes
Construction Stage Impacts					
Erosion or sedimentation caused by during clearing or earthworks	Likely	Minor		Temporary	In the work of excavating and filling the canal embankment, construction of the facilities on the canal (culvert gate receiving water from branch canal, flood spillway) if excavated soil is not collected then siltation will be occurred, obstruct the water transmission capacity from the main canal to branch canal Contractor is responsible for management and controlling. Impact time: estimated 08 months
Generate a big quantity of dredged soil which can be reused	YES	Minor	/Negative	Temporary	There is 9600 m^3 of excess excavated soil will be generated but it will be used for backfill of borrow pit, that left from previous construction. Impacted time: estimated 6 months
Impacts from temporary storage site for construction materials, including: dust, noise.	YES	Minor	Negative	Temporary	- The excess excavated soil will transfer directly to disposal area by trucks, the trsnaportation route will not passing residential area therefore this activity will NOT create noise and dust impacts on residential area. - Transportation of materials for construction like sand, gravel, stone, cement, steels from suppliers to construction site will use main road

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	IS IMPACT LIKELY TO OCCUR YES / NO?	IS IT MINOR OR SIGNIFICANT?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
					cross the Dong Giang commune and will generate noise, dust which affect local residents It is estimated of 1700 turns of truck (10 Ton payload) will need during 6 months or about 9 turns/day - Stone, sand will be located near the construction site where uncultivated land to minimize affecting on living residents; - steel, cement, will be stored at commune PCs, other public buildings or in rented houses. In order to minimize impact for life of residents, temporary material keeping store for sand, stone, should kept in adequate temporary storage site such as CPC, public areas, uncultivated land areas… Besides, construction material include steel, cement, substances will be kept at store of subproject commune or public area. The transportation may be affect the life of local people. Total quantity of materials needed for construction is estimated as: i/cements: is 1678.5 tons ii/sands: 2954 m^3 iii/Gravel, stone: 5314 m^3 iv/Steels: 373.5 tons v/Coffras (ván cop pha): 21897 m2 and vi/ Gravel for road construction: 1350 m3, that no need for temporary storage site because it will be transport directly into the site when needed. Impact level is minor because (i) the volume of construction works is not high; (ii) there is no residential along the construction routes ; (iii) contractor will apply minimize methods to reduce noise, dust, therefore may be minimize impact on local people; Impacted time: estimated 8 months
Polluted soil due to leakage of oil and other chemicals substances.	YES	Minor	Negative	Potentially permanent	Affect the soil due to uncontrolled discharging of wasted oils and lubricants Location: on the subproject route where have on-going construction activities, along canals system. Impact level: is minor, because (i) number of construction machine is small: (approximately 18 vehicles, bulldozers … in total are being use in the construction sites, and it is expected about 126 litters of wasted oil will be generated monthly) main and construction methods is simple; (ii) construction sites are distributed along the canals system .

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	IS IMPACT LIKELY TO OCCUR YES / NO?	IS IT MINOR OR SIGNIFICANT?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
					Impacted time: may be long time and depend on amount of oil/chemicals leakages
Making sensitive flora disappeared and deteriorated	NO				The construction sites are in existing agricultural lands
Air pollution due to dust,exhaust fume and noise	YES	Minor	Negative	Temporary	Location: along the construction route and canals Scale: + Construction activities on canal do not cause dust or exhaust, because (i) the heavy machinery can be used only along the N2 canal; in the rest can be used only light weight and small machinery (ii) the quality of machine has been registered, controlled and maintained periodically, (iii) There are no residents living along construction routes therefore dust and noise being created activities of vehicles, machinery in construction will impact on residents. Location: along the main road cross the Dong Giang commune: the activities of trucks that transporting construction materials to construction site will cause noise and dust pollution and negatively impact on residents living along road (about 800 m) + Impact time. Estimate 08 months, in overall subproject area.
Increase flooding time and area	NO				Floods have never occurred in the subproject area before. The construction works will be mainly undertaken during the dry season. Therefore there is no potential temporary flooding during construction time. Beside, along production road and canals are agriculture land with some natural small stream, ponds that can serve as sinks for water during heavy rain.
Effects on infrastructure works like communication cables and drainage system, etc.	NO				+ Surrounding area has no public infrastructures. There is no electric supply network along the construction routes.
Employment or livelihood benefits from employment of local people	YES	significant	Positive	Temporary	During construction time, local people will recruit for simple technical works (for example do clearance, dredge by hand, transport construction materials from temporary storage site to construction

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	IS IMPACT LIKELY TO OCCUR YES / NO?	IS IT MINOR OR SIGNIFICANT?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
					site, etc… Impacted time: estimated 8 months
Effects on social aspect due to workers at site	YES	Minor	Negative	Temporary	The presence of immigrating workers (i.e. construction workers from other localities) may cause social evil such as gambling, theft, drug, prostitution, etc.. However, these impacts are insignificant because its can be controlled by registration with local police & strict management of Contractor Location: At camps and in nearby residential areas in Dong Giang commune. Impact time: estimate 08 months;
Risks to public or construction worker health or safety	YES	Minor	Negative	Temporary	**Main impact** + Affect transportation of local people, occurs risks for transportation at night, Impact level: is minor Contractor could control site, the demand of transportation along canal + Unsafe risk for road where is used for transporting construction material, especially at intersection with residential road. Impact level: is minor, because volume of vehicle in rural area is low. + Dust: are mainly generated from transportation process, construction material mixing, dredging and filling, stagnant dust and stone soil; Impact level: is minor because frequency is low and construction time is short (04 months in dry season) + Risks are related to accident at field, unsafely machinery of worker. Impact level: is minor because Contractor provided training course on labor safety for worker before project implementation
Effects on nearby heritage items such as graves, pagodas etc.	NO				No heritage items such as graves, pagodas, etc. will be near subproject.
Effect on nearby stone and sand exploring areas, including: dust, noise, land pollution caused by exploring activities	NO				The soil for backfill is not needed (see balancing od excavated soil – above) and all the construction materials will be supplied from licensed sources

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	IS IMPACT LIKELY TO OCCUR YES / NO?	IS IT MINOR OR SIGNIFICANT?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Risks of natural calamity	YES	Minor	Negative	Temporary	Location : along upgrading canal In subproject may be happen flood and storm, most in October and November. Storm and flood often causes flooding Natural calamity will have serious affects on resident life as well as economic growth in the region. However, directly impacts on canal is minor because its position in paddy field, not directly suffered from river However, there is main natural stream still in good status can meet flood drainage capicity Impact level: contractor should construct at proper time to minimize risks.
Risks to public or construction worker health or safety	YES	Minor	Negative	Temporary	+ Risks is related to traffic accident due to lack of signal at night. Impact level: these risks come from (i) lack of construction machine, (ii) Contractor has not yet applied minimize methods. Impacted time: estimated 8 months
Solid waste generated from construction activities or camp	YES	Minor	Negative	Temporary	Location: camp and construction site. +Domestic wastes including solid waste and wastewater in construction camp could cause water and air pollution along canal Scale is minor +Contractor will collect and manage waste. Impacted time: estimated 8 months
Affect watering system for agriculture production	YES	Minor	Negative	Temporary	Construction activities requires stop water supply to ensure pole dry for construction. The construction activities during dry seasons when the watering is being needed will be well scheduled so the water supply for irrigation will be managed. Location: along canals system Impact time: based on plan of water supply and construction time, estimate 04 months during dry season
Impacts in operation stage					
Over exploring for surface water source may affect water supply capacity.	YES	Minor	Negative	Permanent	+If it is lack of synchronous for water allocation between main canal and branch canal, may be occur conflicts for water using from main canal between productive area at first of main canal and

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	IS IMPACT LIKELY TO OCCUR YES / NO?	IS IT MINOR OR SIGNIFICANT?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Not controlled exploring of water along canal that causes conflict between local people.					end of main canal +If water regulation on canal is unadequate , it may be make over exploring water source, use water source ineffectively; Location: Productive area in project area.;
Increasing siltation of Saloun reservoir due to erosion from rubber plantation	YES	Significant	Negative	Permanent	Recently the rubber plantation area is 20 ha and 2 year ages therefore during 3-4 years from 2013 there is high potential of soil erosion and causing siltation of Saloun reservoir. When rubber trees reach 6 years the soil erosion rate will be decreasing gradually (See Annex 1 for detailed)
After canal construction, the quality of water in area may be change due to activities of rubber plantation in Saloun catchment.	YES	Minor	Negative	Permanent	There is potential of washing off fertilizers and fungicides from rubber plantation if the area for rubber plantation will increase but it can be omitted (See Annex 1 for detailed)
Explore water from area where may be affect ecological area and/or natural reservation.	NO				+There is nil natural reservation area and/or ecological area in subproject area; + Water source served for agricultural production is from Saloun reservoir where is used for agriculture production
Change of land using method	YES	Significant	Positive	Permanent	The subproject does not affect on tradition of land using. In the case when water more availability local people may shift from paddy rice to dragon fruit trees (Thanh Long) that could increase income for them.
Erosion or eruption in canal sides	NO				The canal made by beton concreted. Erosion of canal side may be occur in case downgrading the canals.
Affect nutritive substance I soil due to wrong watering	NO				Productive area is even and flat, slope is small and big rainfall could not affect the slope. After irrigation complement, water regulation system operates flexibly, thus, not affect nutritive substance in soil.
Obstructed canal	NO				The canal is small in size

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	IS IMPACT LIKELY TO OCCUR YES / NO?	IS IT MINOR OR SIGNIFICANT?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
may be cause flood					Location: along main canal, culvert supply for branch and regulation culvert.
Risks of natural calamity	NO				Along main canal has regulation culvert system, flood prevention, in order to control and minimize flood.
Changes to traffic safety/traffic activities, commercial activities and access ability of properties.	YES	Significant	Negative	Permanent	Upgrading canal facilitate the transportation of local people along canal side, especially along the canal N2. Besides, in 3-4 years, when rubber plantation will exploit there is will be trucks for transportation rubber latex from rubber plantation around the Saloun reservoir.
Impact on livelihood and employment	YES	High	Positive	Permanent	Improve income and living standard for local people due to increase of agricultural land and productivity;
Impact on ethnic minority groups	YES	High	Positive	Permanent	Increase income for local people
Effect on ecological system	NO				The subproject does not change on ecological system
Increase solid waste in productive area	YES	Minor	Negative	Permanent	Agricultural wastes after harvest or waste of production activities such as insecticide cover, rice straw occurs popular. However, the canals are small in size and easily to clean by hand Location: productive land of 400 ha;
Encroachment land in canal side	YES	Minor	Negative	Permanent	May be occur the encroachment of land for agricultural activities Location: the main and branch canal

V. OUTLINE ENVIRONMENT MANAGEMENT PLAN (EMP)

A. Environmental Mitigation Plan

Table 4: Environmental Mitigation Plan

POTENTIAL IMPACTS	MITIGATION MEASURES	RESPONSIBILITY	COST
Pre-Construction stage			
Break the dam due to Increase active volume of Saloun reservoir	Do not increase the height of dam; The active volume of the Saloun reservoir will increase by dredge some parts of the bed of reservoir (approximately 1500 m^2)	PPMU and Design consulting firm	
Increase the siltation of Saloun reservoir due to soil erosion from rubber plantation around Saloun reservoir. Increase washing off agrochemicals from rubber plantation into Saloun reservoir	Do not increase the area for rubber plantation;	The people committee of Binh Thuan province; The DARD of Binh Thuan;	
	To design and implement artificial barrier wherever needed to prevent eroded soil running into Saloun reservoir, and filtering runoff water from rubber plantation; Control the application rate of agrochemicals.	Private Corporation Son Trang	
Disturbance of UXO	To hire professional unit (i.e. engineering army part) do investigate and destroy any UXO in the subproject area following QCVN 01:2012/BQP	PPMU	
Increase to compensation to loss of cultivating land due to enlarge the canals	Do not enlarge the canals onto the field side	PPMU and Design consulting firm	
Construction stage			
Impacts arising from temporary material store such as: dust, noise, impact on the quality of water, flora	▪ Provide public information for local people on construction conditions; ▪ Do not storage excavated soil for long time, transfer it as soon as possible to disposal site; ▪ Minimize quantity of construction materials that keep in temporary storage; ▪ For affected crop and tree, Contractor should have proper plan, thus, local people may harvest before construction start. ▪ Ensure that all machines are in good operation condition.	Contractor	Without marginal cost
Impacts arising from excavating to enlarge canals, that may temporary impact on the cultivating land of local people	▪ Provide public information for local people on construction conditions; ▪ For affected crop and tree, Contractor should have proper plan, thus, local people may harvest before construction start; ▪ To return cultivating lands for farmers right after finished construction of each sector.	Contractor	Without marginal cost
Pollution of soil and groundwater due to rubbish, chemical substances	▪ Store chemicals (lubricating oil, etc.) in safe area with impermeable containment and weatherproof roof; ▪ Use mobile sanitary toilets following regulations of Health Ministry and washing facilities at construction camps ▪ Do not wash construction vehicles and equipment onsite to avoid pollution by	Contractor	Mentioned in contract with Contractor

POTENTIAL IMPACTS	MITIGATION MEASURES	RESPONSIBILITY	COST
	lubricating oil from washing. ▪ Waste water and wasted lubricating oil should be controlled in accordance with relevant regulations on wastewater and hazardous wastes; ▪ Regularly collect and dispose-off the wastes		
Noise emissions from construction equipment	▪ Ensure construction equipment and vehicles are well-maintained; ▪ Use of noise barriers at anywhere necessary (e.g the place closed to residential area); ▪ Inform local communities near construction area about schedule and duration of construction works ;	Contractor Contractor Contractor	Without marginal cost
	▪ Implement collecting information and feedbacks from the community.	Contractor/ Local assistance group Commune PC Construction monitoring consultant	
Changes on traffic safety/ traffic activities, commercial activities and conditions for property access	▪ Install warning signs, lights and arrange workers at site to implement traffic control ▪ Periodically inform construction plan at each area along the route; ▪ Do not transport construction materials to the construction sites during period from 6 p.m to 6 a.m; ▪ Limit velocity of traffic means on road and avoid activities in rush hour (at the moment of harvest, crop) ;	Contractor ,	Without marginal cost
Affect public infrastructure, including; communication cable, electric line	▪ Minimize broken for road structure in commune through following option : (i) use trucks with limit loading capacity ; (ii) not overloaded loading ; (iii) coordinated with local authorities to make compensation and resettlement option, repair airing broken. ▪ Coordinate with local authorities to implement clearance for construction activities ;	Contractor and local authorities	Without marginal cost
Social disorder and sanitation changes caused by workers	▪ Consult local staff to consider the ability of renting house for workers instead of erecting camps; ▪ In case of camps at site, it is necessary to ensure that camps are maintained in good conditions; ▪ Provide instructions to workers on the way of communicating with local community, abiding laws and traditional customs and culture in the local area and implement education programs on sanitation/hygienic means and diseases through contact;	Contractor Contractor Contractor	Without marginal cost
	▪ Prohibit workers to exploit of natural resources; ▪ Implement the movement on prevention and communication of HIV/AIDS and social violation like smuggling,	PPMU	

POTENTIAL IMPACTS	MITIGATION MEASURES	RESPONSIBILITY	COST
	prostitution, violence and stealing.		
Interruption of water supply	▪ To consider time and schedule for enlarge capacity of Saloun reservoir will not impact on cumulating and supply water. ▪ Start construction of canals from the end ▪ When construct the head of canal system. Carry out construction at dry season, both construct and supply water for productive land, PPMU and Consultant prepared the plan of water supply, including : * Based on harvest: - Winter-Spring crop: from Sep 25th to April 20th; - Summer- Autumn crop: from May 25th – September 20th(for production field 2 crops/ a year). * The plan of yearly water supply of Binh Thuan irrigation works exploring one member company includes: - Winter-Spring crop: provide water for main canal from December 20th, watering continuously and finishes in April 15th; - Summer- Autumn crop: provide water for main canal from May 15th, watering continuously and finishes in August 30th. * To implement the sequencing of water supply and construction. e.g water supply for 10 days, construction for 15 days. ▪ Contractor should coordinate with irrigation management agencies (irrigation works exploring company, commune irrigation staff, households having productive land in water supply area of main canal) to discuss time of water supply stop (stop construction) , construction time);	CPMU; Contractor Contractor,	Without marginal cost
	▪ Inform farmer the time of water supply; ▪ PPMU, Contractor should notice mitigation measurement or compensation option for arising problems due to water supply stop	Binh Thuan irrigation works exploring one member company, local authorities and people	
Operation stage			
Obstruction of production road along canal N2 due to heavy vehicles, especially trucks for latex from rubber plantation	Development mechanism for sharing responsibility for maintain the road between local authority and Son Trang company	Ham Thuan Bac district	Province budget & other allowance
Overloaded exploring for surface water including change water supply capacity for conflict for water using	develop management method with participatory (local authority, canal system management and beneficiaries), including (i) enhance awareness, responsibility for water demand at surface field, water savings for local people; (ii) make watering plan and water distribution properly; (iii) define responsibility for operation and maintenance	Binh Thuan province irrigation works management and exploring company , local authorities in project area and beneficiaries	Province budget & other allowance
Obstructed distribution canal could cause loss	▪ Operate canal regulation system properly, flexibly, avoid obstructed at	Binh Thuan province irrigation works	Budget cost based on

POTENTIAL IMPACTS	MITIGATION MEASURES	RESPONSIBILITY	COST
of water and unequally distribution of water	main and branch canal; ▪ Carry out dredging irrigation system after harvest and big rainfall, flood; ▪ Always check and maintenance canal and water supply works on canal	management and exploring company	regulation of Decree 115
Affect on the quality of water due to the increase of fertilizer, chemicals from rubber plantation in catchment of Saloun reservoir.& in agricultural production	▪ Do not increase the area for rubber plantation	DARD of Binh Thuan	Budget cost will bearing by rubber company
	▪ To control the application rate fo fertilizers and pesticides, fungicides ▪ Coordinate with Agriculture Extension Center to ensure that farmers are trained in correct use of fertilizer and pesticides	The Son Trang company	
Increase the sedimentation in Saloun reservoir due to rubber plantation in catchment of Saloun reservoir.	▪ Do not increase the area for rubber plantation	DARD of Binh Thuan	Budget cost will bearing by rubber company
	▪ To maintain artificial barrier that filtering runoff water	The rubber company	

A. Environmental Monitoring Plan

1. Environmental Effects Monitoring

5. Environmental effects monitoring is carried out to examine impacts of project in relation to ambient environmental conditions.

6. The contractor will monitor environmental effects during construction process. Besides, environment monitoring agency may monitor environmental indicators to analyze bigger effects in subproject area (if any).

Table 5: Monitoring plan for environmental effects

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
Construction stage						
Minimization of noise generation	Noise level	At residential area nearby construction site; (<500 m)	Observation and community consultation	Weekly or when community's feedback is raised	Construction contractor	See the budget for EMP (annex)
				Once/ 3 months during construction or when community's feedback is raised	Construction supervision consultant, PPMU	Budget of PPMU
Minimization of dust generation	Dust concentration	At residential area nearby construction site; (<500 m)	Observation and community consultation	Weekly or when community's feedback is raised	Construction contractor	See the budget for EMP (annex)

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
				Once/ 3 months during construction or when community's feedback is raised	Construction supervision consultant, PPMU	Budget of PPMU
Control watering capacity	Meet the demand of drainage based on approved work-plan	At drainage canals	Use harvest plan, discuss with local people in subproject area	Once/ 3 months during construction or when community's feedback is raised	Construction supervision consultant, PPMU	See the budget for EMP (annex)
				Based on requirement of water supply	Local people, Community monitoring committee Local irrigation staff (commune)	Province budget Without marginal cost
Camp sanitation	Condition of camp sanitation	Camps at site	Observation and community consultation	Weekly or when community's feedback is raised	Local people, Community monitoring committee	Without marginal cost
				Once every 3 months during construction or in case of essential time	Construction supervision consultant, PMU	Budget of PPMU
Labor safety and community safety	Number, use of labor equipment; signal system Obey for traffic law of transportation mean of construction material	In construction area On road where carry material along residential areas of 3 subproject communes;	Observation and community consultation	Weekly or when community's feedback is raised	Local people, Community monitoring committee	Without marginal cost
				Once every 3 months during construction or in case of essential time	Construction supervision consultant, PMU	Budget of PPMU
Operation stage						
Water quality of Saloun reservoir	COD SS Total N Total P Pesticides and fungicides: Cu and Carbenzim	Saloun reservoir	Sampling and analysis	Every 3 months	Binh Thuan DARD and/or irrigation works exploring company	Province budget

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
Use watering water	Conflict for water approach	Productive land of project commune; Productive land at end and first of main canal	Discuss with local authority	Once/ every 3 months during 2 first years	Binh Thuân irrigation works exploring company; beneficiaries	Included in the operation cost of Province irrigation works exploring company
Prevent erosion at canal	Condition of canal, mud level	At section has not been paved	Observation and community consultation	Once every 6 months during 5 first years	Binh Thuan irrigation works exploring company; beneficiaries	Budget cost mentioned in Decree 1115
Prevent erosion at canal side	Condition of canal side	Some representative points in subproject areas	Observation and community consultation	Once every 6 months during 5 first years	Binh Thuan irrigation works exploring company; beneficiaries	Budget cost mentioned in Decree 1115
Waste management	Condition of environment sanitation in project area.	Project area	Observation and community consultation	Once every 6 months during 5 first years	Binh Thuan irrigation works exploring company; beneficiaries	Waste management
Periodically maintenance	Soil deposit in canal heart, culvert inlet and equipment, works on canal.	Along main canal	Observation and community consultation	Once every 6 months during 5 first years	Binh Thuan irrigation works exploring company; beneficiaries	Province budget
	Sediment deposit in Saloun reservoir bed	Saloun reservoir	Observation and measurement	Once every year in the end of dry season	Binh Thuan irrigation works exploring company;	Province budget

2. Environmental Compliance Monitoring

7. Environmental compliance monitoring is carried out to test compliance with operating procedures, technical standards and/or contractor specifications in the EMP. Technical and environment monitoring consultant are responsible for monitoring appliance of contractors with requirement, presented in the table below.

Table 6: Environmental Compliance Monitoring

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
Construction Stage						
Control of erosion	Ensure not happen erosion in construction area	Overall construction area. At productive land nearby canals	Observation and community consultation	After big rainfall, flood Once every 3 months	Construction supervision consultant	Included in the Contract signed with PPMU
Storage of	Condition of	Overall	Observation	Weekly	Construction	Included in

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
materials	material keeping area	construction area	and community consultation	Once every 3 months	supervision consultant	the Contract signed with PPMU
Construction equipment and vehicles	Noise and exhaust generation; covering of trucks; oil/fuel leakage	Throughout construction site	Observation and community consultation	Monthly Once every 3 months	Construction supervision consultant	Included in the Contract signed with PPMU
Construction camp conditions	Sanitation conditions; rubbish collection and treatment equipment, general conditions	At all camps	Observation and community consultation	Monthly Once every 3 months	Construction supervision consultant	Included in the Contract signed with PPMU
Property access	Consolidate temporary and fixed access ability	Affected assets	Observation and community consultation	Once during construction works and once after finishing construction	Construction supervision consultant	Included in the Contract
Waste disposal	Environmental sanitation at construction site and temporary waste storage area	Throughout construction site;	Observation and community consultation	Weekly	Construction supervision consultant	Included in the Contract
Operation stage						
Prevent erosion on canal	Conditions of subproject and mud level	At some locations along the route	Observation	Once every 6 month for first 1 years of operation	Binh Thuan irrigation works exploring company	Included in operation cost of Binh Thuan irrigation works exploring company
Prevent erosion at canal side	Conditions of canal edge	At some locations along the route	Observation	Once every 6 month for first 5 years of operation	Binh Thuan irrigation works exploring company	Included in operation cost of Binh Thuan irrigation works exploring company
Prevent soil erosion from rubber plantation	Condition of artificial barrier	Rubber plantation in surrounding area of Saloun reservoir	Observation	Once every month during wet season for first 5 years of operation	Binh Thuan irrigation works exploring company	Budget of Son Trang Rubber company

B. EMP Implementation Arrangements (EMP)

Table 7: EMP Implementation

Organization	Roles and Responsibilities		
	Subproject Preparation	**Subproject Implementation**	**Subproject Operation**
CPMU	Provide advice to PPMU Safeguards Officer on IEE/CEP and IEE/EIAR preparation Review and provide “no-objection” on IEE/CEPs or IEE/EIARs submitted by PPMUs	Provide advice to PPMU Safeguards Officer on EMP implementation during construction Monitor progress during construction Consolidate PPMU environmental reporting	Provide advice to PPMU Safeguards Officer on EMP implementation during first year of operation Monitor progress during first year of operation Consolidate PPMU environmental reporting
PPC	Sign-off on environmental assessment documents prior to submission for approval Approval of any subprojects requiring EIAR that are not subject to MONRE approval	Project owner with ultimate responsibility for environmental performance of subproject during construction	Project owner with responsibility for operation stage environmental performance including implementation of EMP during operation
DPC	Provide advice and guidance on environmental issues as required during subproject preparation	Monitoring implementation of EMP through their own internal monitoring system	Monitoring implementation of EMP through their own internal monitoring system
PPMU	Engage consultant and have overall responsibility for IEE/CEP or IEE/EIAR preparation and submission for approval Ensure staff are adequately trained in environmental issues	Responsibility for EMP implementation during pre-construction and construction Ensure that contract specifications and bud documents include environmental requirements Undertake inspections and monitoring of environmental issues during construction Coordinate environmental monitoring reporting to CPMU	Responsibility for EMP implementation during first year of operation Undertake inspections and monitoring of environmental issues during first year of operation Assist project owners to incorporate environmental requirements into infrastructure O&M procedures
Ward PCs	Approval of subproject CEPs in accordance with GOV legislative requirements	Monitoring implementation of EMP through their own internal monitoring system	Monitoring implementation of EMP through their own internal monitoring system
construction supervision consultant	n/a	Implement independent environmental monitoring at subproject area twice every 1 month. Monitoring results will be included in the report which will be sent to CPMU once a month.	n/a
District Subproject Support Teams (SST)	Assist in IEE/CEP preparation as required Assist PPMU to review bidding documents, contract documents, and tenders to ensure environmental issues are adequately addressed	Day to day supervision of contractors’ in district including compliance with environmental management requirements Undertake environmental monitoring and coordination of local community environmental monitoring activities	Undertake environmental monitoring and coordination of local community environmental monitoring activities for first year of operation
Commune	Involvement in consultation and	Involvement in environmental	Involvement in

Organization	Roles and Responsibilities		
	Subproject Preparation	**Subproject Implementation**	**Subproject Operation**
Supervision Board (CSB) and local community members[5]	participation activities to identify and develop subprojects Ability to comment on environmental assessment documentation upon disclosure	monitoring activities under the direction of SSTs	environmental monitoring activities under the direction of SSTs
Construction contractor	n/a	Prepare detailed Site EMP to meet the Subproject EMP general requirements Allocate adequate resources to meet the requirements and obligations of Site EMP	n/a

C. Monitoring and Reporting System

Table 8: Monitoring and Reporting System

Project Phase	Type of Report	Frequency	Responsibility	Submitted To Whom
Construction	Site Environmental Performance Report **indicating compliance with Site EMP and monitoring results**	**Monthly**	**construction supervision consultant**	**PPMU**
	EMP Compliance Report **indicating compliance with all subproject's EMPs and monitoring results**	**Quarterly**	**PPMU**	**CPMU**
	EMP Compliance Report **indicating compliance with all subproject's EMPs and monitoring results**	**Bi-annually or twice during construction depending on construction duration**	**CPMU**	**ADB**
	Subproject Environmental Report **indicating overall subproject environmental performance and EMP compliance**	**At completion of subproject**	**CPMU**	**ADB**

[5] CSB is established according to Decision 80/2005/QD-TTg of Prime Minister of GOV. Article 8 of this decision provides the community with opportunities to inspect compliance, monitor implementation and evaluate the results of investments in the commune, including environmental impacts.

Project Phase	Type of Report	Frequency	Responsibility	Submitted To Whom
Operation	EMP Compliance Report: Operation **indicating compliance with subproject EMP commitments during operation**	**01 year for first two years of operation. Ongoing frequency to be determined based on review after 2 years.**	**DARD and/or Operating Company**	**ADB,**

D. EMP Budget

Table 9: Budget for EMP implementation

Item	Marginal Costs for Pre-Construction	Marginal Costs for Construction	Marginal Costs for Operation	Marginal Costs Sub-Total
Mitigation				
Compensation and land clearance	In a separated item on project compensation and resettlement	No	No	Included in other items
Monitoring				
PPMU's Internal monitoring	Included in management cost of PPMU	Included in the Contract with Contractor and CSC as well as in PPMU's management cost	Local and provincial budget	Included in contracts or other operation capital sources
Community monitoring	Not available (n/a)	Local budget (as in Decision No.80/2005/QĐ-TTg)	Local budget (as in Decision 80/2005/QD-TTg)	Local budget
Independent monitoring consultant on environmental safeguard policies	n/a	Included in a separate contract with CPMU	n/a	
Training on capacity enhancement on environmental monitoring capability	n/a		Local budget	n/a
Public disclosure	Defined in consultancy contract on IEE		n/a	Public disclosure
TOTAL *(intensify the capability and public disclosure)*				

VI. PUBLIC CONSULTATION AND DISCLOSURE ACTIVITIES

A. Description of Activities to Date

Table 10: Public consultation and disclosure activities

CONSULTATION METHOD	DETAILS OF ACTIVITIES	
Correspondence and meetings with local authorities (District and Commune PCs, Commune Fatherland Front, Women Union, Youth Union and others)	Arrangement	PPMU contact via phone and agree working plan
	Dates of meetings	From 11th to 20th July 2013
	Minutes of meeting attached (Yes / No)	Yes
Newspaper notification or public/radio announcement	Date(s) of notice	3 days in advance
	Public announcement	Commune PCs inform heads of villages
Public meeting	Date(s) held	From 11th to 20th July 2013
	Location(s) held	Dong Giang Communal People's Committee
	Invitees	
	Methods of invitation	By inform management staff of commune (head of villages will inform households). Coordinate with Women Union and call for participation of women
	Agenda attached (Yes / No)	No
	Minutes of meeting attached (Yes / No)	Yes
	Number of attendees	See annex

B. Outcomes of Public Consultation to Date

Table 11: Community Consultation Results

Description of Issue Raised	By Whom?	Required Follow-up Actions?
Dust or exhaust generated from construction machines	Fatherland Front of Dong Giang commune;	Apply mitigation measure
Noise from construction machines	Fatherland Front of Dong Giang commune;	Apply mitigation measure
Affect water supply and agriculture production	Farmer union	Make plan for water supply properly. Require farmer to implement in accordance with harvest
Change approach capacity for service due to road construction and adding works on canal.	Fatherland Front of Dong Giang commune;	Note and implement

C. Future Public Consultation Activities

Table 12: Expected community consultation activities

Activity	Participants	Expected Outcomes	Schedule	Cost Estimate
Kick-off meeting prior to construction commencement	PPMU, the Contractor, CSC, community representatives at project area	Publicize construction contents, schedule and plan for water supply	1 week prior to construction commencement	Be estimated in EMP budget
Periodical meetings	Contractor, CSC and representatives of	Periodically check mitigation activities	Once every month from construction	Included in contract signed

Activity	Participants	Expected Outcomes	Schedule	Cost Estimate
	local authority, organizations and community at project area	and arising problems Propose treatment alternatives and reach agreement on implementation	commencement	with parties

VII. CONCLUSIONS AND RECOMMENDATIONS

8. The Upgrading Saloun Reservoir and Irrigation System subproject, part of the IDRSPCP – Additional Financing Project will be implemented by Ham Thuan Bac district PMU in Binh Thuan province.

9. The implementation of the subproject could acquire 30,907 m^2 of land, of which 27,323 m^2 of private agricultural land of 53 households.

10. There is high potential of increasing siltation rate of Saloun reservoir due to soil eroded from 20 Ha rubber plantation in surrounding Saloun reservoir. The impact level will be high unless artificial barrier filtering runoff water will applied properly.4. Project environmental assessment implemented and main potential environmental impacts of subproject in construction stage:

a) Construction activities may be cause air pollution and noise. The impact level is low due to the fact that there are no residents living along construction routes.
b) Construction activities may cause pollution to soil and agricultural land due to discard of lubricant oils, chemicals unless it will be controlled properly.
c) The transportation of construction materials and gathering of disposal material may affect air and soil environment of surrounding areas and affect life of local people;
d) The construction of canal systems may interrupt water supply;
e) Other risks like labor incidents at site in rainy season, land slide and unsafely use of electric devices and other labor equipment/facilities:

- The transportation of construction material in residential area affect traffic safety, especially in crossing points;
- Dust pollution caused by transportation and temporary storage of construction materials. The pollution happened along road and construction routes;

11. Main potential environmental impacts of subproject in operation stage

a) High potential of increasing siltation rate in Saloun reservoir that lead to more frequency cleanup of reservoir bottom.
b) Risk of after-harvest wastes and other wastes like packages of insecticide/pesticide on canal: (i) cause environmental pollution on canals; (ii) cause land and water pollution serving for agricultural production.
c) Risks of conflict on water usage between farmers.
d) Risk of obstruction of production road along canal No.2 due to activities of heavy vehicles, especially the trucks for transportation of latex from rubber plantation;

12. Mitigation measures and monitoring methods applied for subproject, including the following activities:

Design stage

a) To design and construction of artificial barrier for filtering runoff water from rubber plantation in surrounding area of Saloun reservoir

Construction stage

b) To collect garbage and sign contract with Binh Thuan urban environment company to carry and disposal of wastes properly;
c) To collect all wasted oils, lubricants, chemicals, and sign contract with authorized company to disposal of as hazardous wastes;
d) To apply proper measures to prevent dust from transportation, storage processes for construction materials;
e) Construction constructor should avoid and prevent health risks, safety for worker and local people with following methods: (i) provide labor safety equipment for worker at site; (ii) ensure safety for construction area and avoid approach of resident by fence and signal system at site, install electric light at night in construction area to ensure safety for resident; (iii) ensure safety for worker and residential in transportation process of material.
f) In order to minimize impacts of construction process on water supply for productive area; construction contractor should use method, including: (i) construct in dry season on canal. In dry season, apply construction measurement combined construction and water supply for agricultural production; (ii) coordinate with irrigation management unit (irrigation works company, commune irrigation staff, households having productive land in water supply of main canal to exchange work plan of water supply (stop construction), construction time; (iii) Inform time of water supply for local people through commune irrigation staff, irrigation works exploring company and relevant local authority; (iv) PPMU, construction contractor pay more attention to minimize method for damage or compensation for arising problems due to the stop of water supply.
g) To instruct migrating workers in the cultures of local minority ethnic people to avoid misunderstanding between workers and local population

Operation stage

h) In order to minimize conflict for water use between farmers, should have allowance methods of agricultural management agencies such as participatory management method (of local authorities, canal system management and beneficiaries) in which; (i) improve awareness and responsibility of local people for water savings; (ii) watering work plan and distribution properly; (iii) define responsibility for canal operation and maintenance.…
i) To prevent obstruct the capacity of water supply, canal management agency should: (i) operate and regulate canal properly, flexibly with real condition, avoid overflow on main and branch canal; (ii) Dredge mud and soil at canal heart after big rainfall and flood; (iii) Regularly check and maintain water supply works on canal;(iv) Regularly check the status of artificial barrier that filtering runoff water from rubber plantation during wet seasons.
j) To prevent accumulation of after-harvest agricultural wastes, packages for agrochemicals on canal that leads to land and water pollution, the District environmental department should have following program: (i) collect waste periodically on canal and surface of field; (ii) develop waste collection system; (iii) enhance the awareness of local people on waste collection, management through training course;
k) For encroached land at canal side and canal corridor for individual objective: irrigation system management and operation agencies, local authorities should enhance control methods to minimize encroachment, carry out information disclosure to enhance the awareness of local people.

Monitoring methods

l) The Contractor shall make a plan and commitment on implementing mitigation measures in aspects of implementation locations/mitigation measures/ and

implementation frequency. Concurrently, the Contractor shall prepare a detailed EMP and arrange enough manpower for meeting general requirements and compulsory regulations on EMP on site;

m) In operation stage, the Project Owner (the project operation unit) should periodically implement management works on water quality following Vietnam's current regulations;
n) PPMU should intensify the Contractor's compliance with environmental regulations and coordinate with authorities at levels in the local area and implement EMP.

Conclusions and recommendations

a) The investment of subproject aims to improve the effectiveness of irrigation, living standard and reduce poverty for local people. Thanks to water management, it is estimated that about 400 ha of rice, dragon fruit and other crops will benefit. Some benefits will come through changing crop from rice to dragon fruit trees. These brings economic effectiveness and contribute agriculture -rural development according to State regulation, especially for minority ethnic groups
b) The results of environmental study presents that negative impacts during project implementation could minimize through environmental management measures including monitoring programs. Negative impacts related to project is mainly from construction process and these are temporary impacts.
c) Based on IEE report, Safeguard Policies Consultant and PPMU would like to request pertinent authority to collaborate actively to solve any issues that may arise during construction and operation of the subproject.

ANNEX 1: ASSESSMENT OF IMPACT OF RUBBER PLANTATION ON SALOUN RESERVOIR

1. Natural incoming silts/sediment

In accordance with design of the Saloun reservoir the annual amount of silt/sedimentation incoming from natural flows as follows:

W_o ($10^6 m^3$)	W_{cl} (Ton)	$W_{cđ}$ (Ton)	W_c (Ton)	V_c (m^3)
8.631	777	156	933	1333

Where:

- W_o = total annual flow in standard condition;
- r_o = density of suspended solid in incoming water flow, select r_o= 90 g/m^3;
- W_{cl} = Total amount of suspended solid $W_{cl} = W_o * r_o * 10^{-6}$ (ton)
- $W_{cđ}$ = Total amount of settlable solid $W_{cđ} = W_{cl} * 20\%$
- W_c = Total incoming solid; $W_c = W_{cl} + W_{cđ}$
- V_c = Volume of annual solid that accumulated in the reservoir; $V_c = W_c/g$
- g = specific gravity of settle solid = 0.7

2. Sediments from rubber plantation

The sediment from rubber plantation around the Saloun reservoir is estimated based on TCVN 5299:1995 'Soil quality - Method for determining potential erosion effected by rain' as follows:

A=RKLSCP

Where:

- A is soil loss rate (t/ha)

R is the rainfall factor computed on the basis of rainfall energy, (R-factor)

$R = B*t^{-0.5}$

B – Rainfall not less than 9.5 mm with intensity not less than 0.18 mm/ min.

t – Time of rain event with rate not less than 9.5 mm and intensity not less than 0.18 mm/min

- K is Soil erodibility factor (K-factor)
- $LS = L^{0.5} *(0.00111*S^2 + 0.0078*S + 0.0111)$

  L is the slope length factor, m;

  S is the slope steepness factor, %;

  The rainfall rate in Saloun reservoir area is as follows:

Months	I	II	III	IV	V	VI	VII
Xo (mm)	0.80	2.10	11.69	32.70	180.50	232.48	273.12
Months	VIII	IX	X	XI	XII	Annual	In Wet season (V-X)
Xo (mm)	427.90	352.82	210.49	70.44	4.95	1800	1677.31

Based on results of site survey we can estimate soil loss rate during wet season, e.g. from May to October, from 2013 to 2017 when rubber trees reach 6 year olds, as 95.91 ton/ha. The result is compatible with Pham Van Dien[6] and Nitipat[7]. After 2017 the soil loss rate will decrease gradually and reaches 6 ton/ha when rubber trees reaches 20 year old (Phuoc Hoa Water Resources Project[8]).

Based on results of site survey and estimated above we can assess the impact of siltation of Saloun reservoir from 2013 to 2031 as follows:

Year	Age of rubber tree	Soil loss rate	Total soil loss rate from 20 Ha rubber trees	Total amount of settable solid	Total amount of settlable solid from natural incoming flows[9]	Contribution of soil loss from rubber plantation to natural amount
		(ton/ha/year)	(ton/year)	(ton/year)	(ton/year)	
2013	2	95.91	1918.16	383.63	933	41%
2014	3	95.91	1918.16	383.63	933	41%
2015	4	95.91	1918.16	383.63	933	41%
2016	5	95.91	1918.16	383.63	933	41%
2017	6	95.91	1918.16	383.63	933	41%
2018	7	89.49	1789.72	357.94	933	38%
2019	8	83.06	1661.28	332.26	933	36%
2020	9	76.64	1532.84	306.57	933	33%
2021	10	70.22	1404.40	280.88	933	30%
2022	11	63.80	1275.96	255.19	933	27%
2023	12	57.38	1147.52	229.50	933	25%
2024	13	50.95	1019.08	203.82	933	22%
2025	14	44.53	890.64	178.13	933	19%
2026	15	38.11	762.20	152.44	933	16%
2027	16	31.69	633.76	126.75	933	14%
2028	17	25.27	505.32	101.06	933	11%
2029	18	18.84	376.88	75.38	933	8%
2030	19	12.42	248.44	49.69	933	5%

[6] Pham Van Dien, Nguyen Trung Thanh. Rubber plantations or forests on slope lands in Vietnam: Soil erosion versus economic profitability. Poster 1.1 Soil care / water and matter

[7] Nitipat Nuanmano, Saowalak Roongtawanreongsri 1 , and Charlchai Tanavud 2; Soil Erosion in Rubber Plantations on Kho Hong Hill, Hat Yai District, Songkhla Province, Thailand. DOI: 10.7763/IPEDR. 2012. V52. 18

[8] Phuoc Hoa Water Resources Project. ADB loan No. : 2025 –VIE (SF). Study on Be catchment protection, forest management and reforestation for Phuoc Hoa reservoir.

[9] The scenario without rubber plantation

Year	Age of rubber tree	Soil loss rate	Total soil loss rate from 20 Ha rubber trees	Total amount of settable solid	Total amount of settlable solid from natural incoming flows[9]	Contribution of soil loss from rubber plantation to natural amount
		(ton/ha/year)	(ton/year)	(ton/year)	(ton/year)	
2031	20	6	120.00	24.00	933	3%

The results showed that the impact level is very significant and an artificial barrier must be design and implement to filtering the runoff water from rubber plantation in surrounding area of Saloun reservoir.

3. Fertilizers from rubber plantation

In accordance with IFA's 'World Fertilizer Use Manual' the nutrient balances for rubber trees in lifecycle of 30 years as follows:

Tree: 1500 – 1800 kg N; 458-573 kg P_2O_5; 1440-1680 kg K_2O

Leaf: 1400 kg N; 82 kg P_2O_5; 426 kg K_2O

Latex: 485 kg N; 94 kg P_2O_5; 418 kg K_2O

Practically, in the project area density of rubber trees is 550 trees/ha and the N-P-K fertilizer using is 200 g/tree/year or 220 kg/ha/year.

The latex can be extract from 5th year since the date of plantation therefore we can estimate fertilizer loss during 20 years lifecycle of rubber as follows:

Time period	Fertilizer used (kg)	Fertilizer come into tree (kg)	Fertilizer in latex (kg)	Fertilizer in Leaf (kg)	Balance (kg)
1st 5 years	1100	621	0	318	161
From 6 year to 20 years	3300	1863	499	954	-15

Every year the leaves will fall down from rubber trees and therefore in practices all fertilizers accumulated in leaves will come back to the soil via biodegradation of fallen leaves. Assumed that 25% of fertilizers accumulated in leaves will become free N,P, K compounds the total amount of N,P,K available to washing off into the Saloun reservoir can estimate as:

For 1st 5 years: 161 + 318*25% = 240.5 kg

For 15 years from 6th year: -15+954*25%= 223.5 kg

The maximal water volume of the Saloun reservoir is 1,147,000 m^3 there for the contribution of rubber plantation to increase nutrient content in water is very small and negligible.

ANNEX 2: COST ESTIMATION FOR EMP

1.1. Cost for implementation of mitigation measures

Following regulations of Vietnamese Laws, Contractor must ensure 4 following HSET criteria: i/Health for Community (Health); ii/Site Safety (Safety); iii/Environmental Safety (Environment) and iv/Transport Management (Transportation).

Cost for organization, training, dissemination, and procurement, operation of equipment, and manpower for implementation of mitigation measures in and out of the site in accordance with HSET requirements were integrated in construction package. Contractors will be responsible to study, prepare alternatives and offer cost estimation for these activities. This will be considered as one of criteria for assessing the capability of the Contractor in the future and also to be a basis for assessing the compliance level of the Contractor.

In case of violations, the Client can put penalty regulations into application or hire another unit to participate in solving arising problems.

1.2. Monitoring cost

- **Cost for frequent monitoring of Construction Supervision Consultant (CSC)**

Contractor when participate in bid competition for the package on construction supervision for works under the subproject will be allowed to propose organization and monitoring for the Contractor's implementation of mitigation measures. CSC will be required to arrange staff and detailed working plan to serve environmental sanitation and labour safety management on and around the site. The cost for this assignment will be proposed in the contract signed with CSC.

Table A.1: Cost estimation for construction monitoring

Items	Quantity	Unit price (VND)	Total
Dust monitoring	4 samples/3month x 9 months	159,500	1,914,000
Noise monitoring	4 samples/3month x 9 months	88,000	1,056,000
Monitoring drinking water	1 samples/3 month x 9 months	616,000	1,848,000
Wastewater monitoring	1 samples/3 month x 9 months	715,000	2,145,000
Solid waste and hazardous waste disposal monitoring	per 9 months	3,000,000	3,000,000
Construction waste disposal monitoring	per 9 months	3,000,000	3,000,000
Borrow arrea	per 9 months	3,000,000	3,000,000
Health and Safety	per 9 months	3,000,000	3,000,000
Socio- Economic losses	per 9 months	3,000,000	3,000,000
Report	1 times/3 months x 9 months	10,000,000	30,000,000
Total	**9 months**		**51,963,000**
VAT 10%			**5,196,300**
Grand total			**57,159,300**

- **Cost for community monitoring system**

According to regulations of Vietnamese laws, the participation of community monitoring system will be primarily in voluntary mode without any assistance cost. Community monitoring organizations will receive assistance from PMU through capacity building programs and provided with necessary documents, papers and forms to facilitate site supervision works.

1.3. Cost for implementation of capacity building and training

Cost estimation for implementation of capacity building and training is presented in the following table:

Table A.2: Cost estimation for implementation of capacity building and training

Training contents	Subject to be trained	Number of trainees	Cost rate (VND)	Source of cost
Instruction of EHS (Environment and Health Safety)	Workers and technicians of Contractors	All workers and construction staff on site (estimate 40 persons)	50 x 200,000 = 10,000,000	Paid by contractor, this cost is included in the contract of construction
Instruction of environmental management process	PPMU's staff in charge of construction packages	mentioned in IEE	mentioned in IEE	mentioned in IEE
Instruction on environmental management plan (EMP)	Environmental staff under commune PC in the project area	6 personnel (2 district staff of Ham Thuan Bac district + 4 staff of Dong Giang commune)	6 per, x 1,000,000/per, = 6,000,000	Included in the Contract signed with training consultant or Independent Environmental Monitoring Consultant
Instruction on Site environmental Management Plan	Staff in charge of EHS under CMC	5 trainees	5 per, x 1,000,000/per, = 5,000,000	In the Contract of Construction Monitoring Consultant (CMC)
Total cost			**21,000,000 VND**	

1.4. Cost for public disclosure

Local authorities and community representatives who are likely to be affected by the project will be informed of subproject on construction plan, environmental impacts and their mitigation measures as well as Environmental System Management that will be applied into this subproject.

Cost the public disclosure will be consist of: (i) cost for holding a meeting in Dong Giang commune and (ii) cost for document, photos supporting public disclosure. Total cost for this item will be: 1,000,000 VND.

1.5. Total Cost estimation

Table A.3: Total Cost estimation

Contents	Cost (VND)
Cost for construction monitoring	57,159,300
Cost for capability building and training	21,000,000
Cost for public disclosure	3,000,000
Total	81,159,300

ANNEX 3: DETAILS OF PUBLIC CONSULTATION

Detail of public consultant meeting

1. Participants: project safeguard consultants, PPMU and with participation of representatives from commune people's committee, relevant social organizations and related hamlet heads and 77 attendants represented for households (including 31% women).;

2. **Targets**: Publicize subproject information and implement community consultation on potential environmental impacts as well as proper mitigation measures;

3. **Contents**:

3.1. Safeguard policies consultant gives general introduction on construction works;

3.2. Main environmental impacts and mitigation measures on the areas which are defined by safeguard policies consultant, including:

+ Environmental and social impacts prior to construction commencement, including normal impacts like occupation of residential land, agriculture land, trees of households, areas with UXO remained from wars; and corresponding mitigation measures;

+ Environmental impacts during construction such as dust, noise, exhaust fume, traffic safety on residential areas near the subproject, other impacts on agriculture production; and corresponding mitigation measures;

3.3. Public consultation on potential environmental impacts and mitigation measures applied before and during operation;

3.4. Safeguard policies consultant gives general introduction on Vietnam's current environmental management system which might be applied during construction of this subproject, responsibilities of relevant authorities (Ham Thuan Bac department of Natural Resources and Environment, and Commune authority), contractor, CSC and community monitoring board;

Details on meeting participants and contents were presented in minutes of community consultant meeting. Opinions of the community were mentioned in detail in minutes of community consultant meeting and Table 11: "Community consultation results".

4. Outcome of public consultation:

The implementation of the subproject could bring many benefits to local population likes: can supply more water for irrigation, give them opportunities to switch crop from rice, maize.. to dragon fruit trees (higher economic revalue) and better production road so could increase the vending of agricultural products.

The implementation of the subproject, asides the positive/active environmental impacts on biotic and abiotic as well as public health/safety, will cause some non-avoidable negative impacts on:

- Normal daily life activities of local population like dust, noise from activities of vehicles for transportation of construction materials, and machinery for construction. However, there is no resident living along the construction routes; The nearest house is in distance of 500 m far from the construction routes; and the construction's time is short (about 8 months) therefore the impacts can be considered as negligible;
- Movement of farmers and tractors along the production road along canal No.2. Practically the quality of existing road is poor and contractor will return the flatness of the road surface daily so the impact is minor and the time span is just for 8 months;

- The temporary affect the crops of 53 affected households during construction due to excavation works. The contractor will collaborate with local population during construction to minimize the losses of those households;

There are also potential negative impacts:

- The potential of accidents due to activities of trucks and other heavy machinery along the road to construction sites. The impacts can be controlled by good transport management practices;
- The potential of soil contamination due to uncontrolled wasting of used lubricant oils, wasted chemicals and garbage from site's camps. The impacts can be prevented by strictly control of wastes discharging; provision of drum for collection of wasted oils, lubricants; provision of dust bins; and regular remove wastes to proper wastes treatment/landfills by authorized waste treatment companies;
- The potential conflicts between immigrant workers and local population especially the ethnic minorities due to unwanted violations of local cultures, hobbies, rules etc.. the impacts can be prevented by proper instruction of local cultures, hobbies and rules to immigrate workers as well as collaboration of commune authorities to manage the workers;

There is also must be emphasized on responsibility of Son Trang rubber company on design and implementation of artificial silts barrier for rubber plantation around the Saloun reservoir to prevent washed of eroded soils into Saloun reservoir[10].

In order to control, minimize all potential negative impacts the commune authorities and local population will actively participate on monitoring the implementation of the subproject during construction phase as well as voluntary and active collaborate with authorities in maintenance and operation of the irrigation system.

[10] During public consultation, the chairman of Dong Giang commune said that the requirement had been give to Son Trang rubber company but the measure not yet implemented.

ANNEX 4: MINUTES OF THE PUBLIC CONSULTATION

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập – Tự do – Hạnh phúc

Đồng Giang, ngày 8 tháng 7 năm 2013

DỰ ÁN PHÁT TRIỂN NÔNG THÔN TỔNG HỢP CÁC TỈNH MIỀN TRUNG

(S-PPTA for Loan 2357-VIE)

DANH SÁCH THAM DỰ CUỘC HỌP

(Tham vấn cộng đồng các chính sách về Môi trường)

Tên tiểu dự án: Salon

Xã Đồng Giang, huyện Ninh Thuận, tỉnh Ninh Thuận

STT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
01	K Văn Sáu	Xóm 6, Thôn III	Sáu	
02	K Văn Chính	Xóm 9, Thôn II	Chính	
03	K Văn Vinh	Xóm 4, Thôn II		
04	K Chị Srim	Xóm 4, Thôn II		
05	K Văn Rí (Thịnh)	Xóm 6, Thôn III		K Văn Thịnh
06	K Văn Phước	Xóm 5, Thôn I		
07	K Văn Vẻn	Xóm 6, Thôn III	VẺN	
08	Giai Văn Mẫn	Xóm 6, Thôn III		
09	Nga Minh Lúc	Xóm 6, Thôn III		
10	K Chị Sanh	Xóm 6, Thôn III	Sanh	
11	K Văn Sinh	Xóm 2, Thôn I	Sinh	
12	Huỳnh Chúc Mẫn	Xóm 3, Thôn II		
13	Huỳnh Văn Đẹp	Xóm 6, Thôn III	Đẹp	
14	K Chị Hửn	Xóm 6, Thôn III		
15	K Chị Hải	Xóm 6, Thôn III		
16	K Chị Rửn	Xóm 6, Thôn III		

STT	Họ và tên	Địa chỉ	Ký tên	Ghi chú
17	K Văn Tấn	Xóm 6, Thôn III		
18	K Thị Hiền	Xóm 4, Thôn II		
19	K Thị Đa	Xóm 6 - III		
20	K Thị SRim	Xóm 9, Thôn II		
21	Phan Thị Hồng	CHT. Phụ nữ xã		
22	Hồ Văn Diễn	CT xã		
23	Phạm Xuân Tỷ	Địa Chính xã.		
24	Hồng Văn Đạt	Thôn 6, thôn III		

Đại diện cộng đồng

B.C.H PHỤ NỮ XÃ BÌNH GIANG

Đại diện UBND xã

Nguyễn Như Diễn

Đại diện Ban QLDA tỉnh

PHÓ GIÁM ĐỐC

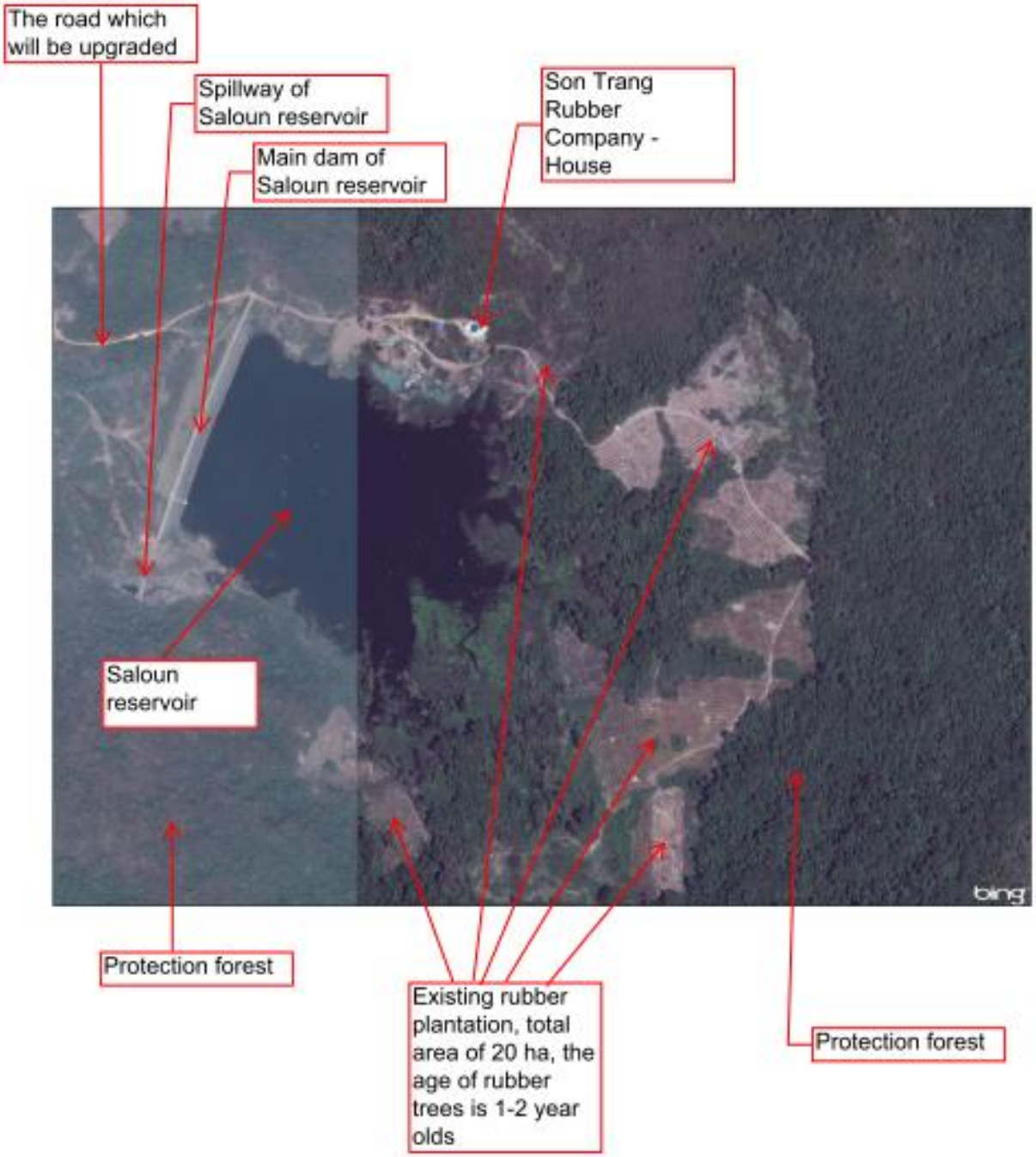
Vũ Chí Nam

Đại diện tư vấn

Nguyễn Như Dũng

Annex 5: Pictures

Aerial view of Saloun reservoir



Pictures on Saloun reservoir

View of Saloun reservoir from rubber plantation

Rubber plantation of Son Trang Company

Pictures on existing canals system

Pictures on existing road along the canals system

Pictures on public consultation

ANNEX 6: DATA SOURCES USED IN PREPARATION OF IEE/CEP

a. 2012 Statistic book of Binh Thuan Department of Statistic- Statistic Publising house
b. 2012 statistic data of Ham Thuan Bac dsitrict
c. Description of Saloun reservoir project under compensation program of Ham Thuan – Da Mi hydropower project
d. Investment report for The Subproject prepared by Binh THuan PPC in .