Initial Environmental Examination

October, 2015

VIE: INTEGRATED RURAL DEVELOPMENT SECTOR PROJECT IN THE CENTRAL PROVINCES (Additional Financing)

SUBPROJECT: UPGRADING OF DU DU RESERVOIR SUBPROJECT-BINH THUAN PROVINCE

Prepared by Central Project Management Unit – Agriculture Project Management Board - Ministry of Agriculture & Rural Development for the Asian Development Bank

CURRENCY EQUIVALENTS

(as of 15 September 2014)

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
FPD	Forest Protection Department
IEE	Initial Environmental Examination
IPM	Integrated Pest Management
IRDPCP	Integrated Rural Development Project in Central Provinces
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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1. INTRODUCTION

2. 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.

3. Due to the success of the project, ADB proposes to provide 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 the 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.

4. As part of IRDPCP 2nd phase, Subproject of Du Du Reservoir's upgrading will be constructed in Ham Minh and Ham Cuong communes in Ham Thuan Nam District, Binh Thuan Province

5. This Initial Environmental Examination/Commitment on Environmental Protection (IEE/CEP) document has been prepared to meet the environmental safeguards requirements of the ADB1 and GOV2. The IEE/CEP contains the following information:

    (i) Section II contains a description of the subproject;

    (ii) Section III contains a description of environmental conditions in the vicinity of the subproject;

    (iii) Section IV contains a describes potential environmental impacts of the subproject;

    (iv) Section V contains the environmental management plan including mitigation measures, monitoring system and cost estimation for Environmental Monitoring System (EMS) implementation;

    (v) Section VI contains activities description on community consultation and subproject disclosure;

    (vi) 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

2. PROJECT DESCRIPTION

Table1. General information of subproject

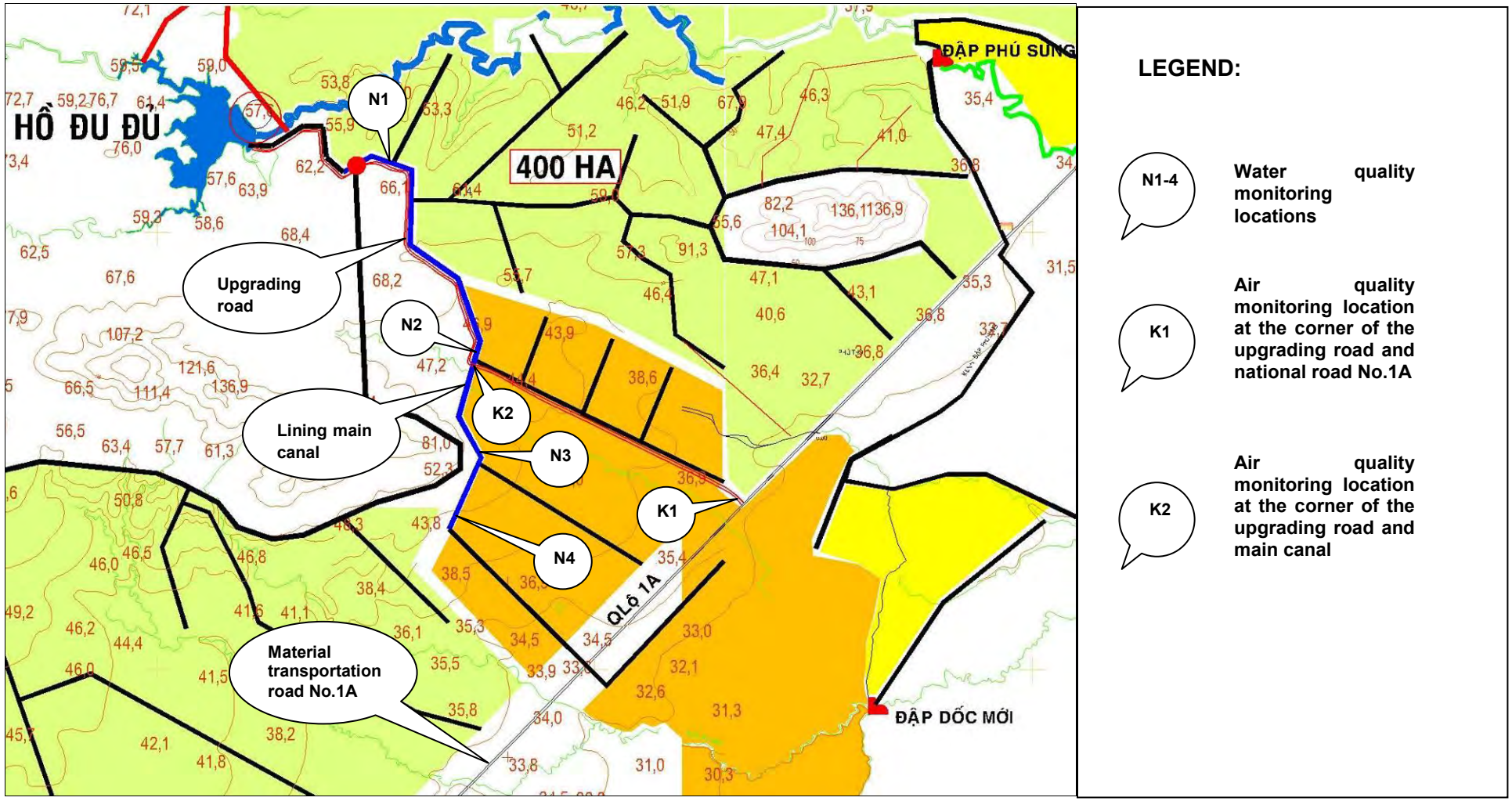
DATA ITEM	SUBPROJECT DATA
GENERAL INFORMATION	
Subproject Name	Upgrading of Du Du Reservoir
Subproject Type	Irrigation
Project owner	Department of Agriculture and Rural Development, Binh Thuan Province
Address of Project owner	17 Thu Khoa Huan Road, Phan Thiet City, Binh Thuan Province
Name and Title of Head of PPMU	Vu Xuan Huynh Title : Director
Telephone, fax and email details of PPMU	0913883083 huynhthuyloi@yahoo.com.vn
Name of Environmental Officer of PPMU	Nguyen Hong Truong
Telephone, fax and email details of PPMU Environmental Officer	0917230379 hongtruongqlda@gmail.com
SUBPROJECT DESCRIPTION	
New project or rehabilitation project	Reservoir and main canal upgrading
Surface water or groundwater source	Surface water source
Determination of water source	Du Du Reservoir
Determination of basin area	13.9 km^2
For irrigation subproject, is water enough for living activities?	According to design assignments, the work will supply water for 410 ha of 3 crops , irrigated by gravity for 980 ha of dragon fruit, and domestic water supply for 5,354 peoples in dry season
Reservoir's efficient water vollume	3.32 x 10^6 m^3
Reservoir/ length & width of upgraded dam	*Height of Du Du dam* Increase dam height from 63.30 m to 63.50 m *Length of Du Du dam* : Lengthen of the dam from 1240 m to 1266.68 m *Width of Du Du dam crest* Widen of the dam crest from 5.0 m to 8.5 m
Spillway upgrading	Spillway to be not changed : Threshold elevation: 61 m Width of spillway: 2 gates x 3 m
Number of intakes and outlets	Intake: 01; outlets on main canal : 06
Length of main canal to be upgraded/concreted	Main canal: 2,996.8 m (Km 1+483.8 – Km 4 + 680)
Width and depth, capacity of upgraded main canal	Section 1: Km 0+000 –Km 1+483.8: width & depth are not change as canal have added function , that is transferring water to Tan Lap Reservoir 's area

<table>
<tr><th>DATA ITEM</th><th>SUBPROJECT DATA</th></tr>
<tr><td></td><td>Section 2: Km 1+483.8 – Km 4 + 680 is designed to be rectangular & concreted with designed width & depth as bellow table
<table>
<tr><th>No</th><th>Canal section</th><th>Capacity (m³/s)</th><th>Max Capacity (m³/s)</th><th>Width (m)</th><th>Depth (m)</th></tr>
<tr><td>1</td><td>K1+863.24-K2+381.72</td><td>0.482</td><td>0.627</td><td>1.00</td><td>1.00</td></tr>
<tr><td>2</td><td>K2+381.72-K2+542.43</td><td>0.433</td><td>0.563</td><td>0.80</td><td>1.00</td></tr>
<tr><td>3</td><td>K2+542.43-K2+979.02</td><td>0.397</td><td>0.516</td><td>0.90</td><td>1.00</td></tr>
<tr><td>4</td><td>K2+979.02-K3+316.47</td><td>0.125</td><td>0.163</td><td>0.60</td><td>0.80</td></tr>
<tr><td>5</td><td>K3+316.47-K3+772.56</td><td>0.108</td><td>0.140</td><td>0.60</td><td>0.70</td></tr>
<tr><td>6</td><td>K3+772.56-K3+832.84</td><td>0.108</td><td>0.140</td><td>0.60</td><td>0.70</td></tr>
<tr><td>7</td><td>K3+832.84-K4+134.70</td><td>0.108</td><td>0.140</td><td>0.60</td><td>0.70</td></tr>
<tr><td>8</td><td>K4+134.70-K4+680.05</td><td>0.108</td><td>0.140</td><td>0.60</td><td>0.70</td></tr>
</table></td></tr>
<tr><td>Length and width of approaching road</td><td>Length of management road: connect from NH1 to head work with length 4,067.55 m, road surface wide: 5 m , road side wide: 2 x 1.0 = 2.0 m</td></tr>
<tr><td>Description of auxiliary works</td><td>– 6 inlet culverts on the main canal
– 2 water stairs
– 3 bridges over the canal;
– 6 spill way in to canals
– 4 drainage culverts</td></tr>
<tr><td>CONSTRUCTION ACTIVITIES</td><td></td></tr>
<tr><td>Construction commencement date (month/year)</td><td>December 2015 (expected)</td></tr>
<tr><td>Construction completion date (month/year)</td><td>December 2016 (expected)</td></tr>
<tr><td>Number of construction workers</td><td>60 – 100 people (expected)</td></tr>
<tr><td>Construction camps required (Yes/No)</td><td>Yes, 3 -4 camps estimated</td></tr>
<tr><td>Construction in wet season (Yes/No)</td><td>Yes (if possible)</td></tr>
<tr><td>Number of construction equipment and machines</td><td>i) Dump trucks of 10 tons
ii) Excavators of 0.8 m^3 – 1.6 m^3
iii) Bulldozers of 75 CV – 108 CV
iv) Concrete mixing machines of 250 l and mortar mixing machines</td></tr>
<tr><td>Location and area of borrow area or description of material source</td><td>- Filling soil will be taken at borrow pit in Ham Minh Commune, about 1-2 km to the site
Soil exploitation areas, which are location in the planned area of Ham Thuan Nam district and Ham Minh Commune authorities.
- Cement, steel, formwork will be bought in Ham Thuan Nam District located in distance 16 km from the subproject site</td></tr>
</table>

DATA ITEM	SUBPROJECT DATA	
	- All types of stone will be bought in Tan Ha quarry in Ham Tan district, about 34 km to the subproject site - Sand will be taken in sand quarry No 37 in Ham Thuan Nam District, about 22 km to the subproject site - Red gravel will be exploited in the subproject area	
Description of discarded soil (estimated quantity and treatment method)	Excavated soil of all types: 35,700 m^3 Filling soil of all types: 60,500 m^3 Discarded soil quantity: 7,140 m^3 (20% of excavated soil) Discarded soil will be dumped at places under permission from Commune authorities in Ham Minh and Ham Cuong Communes.	
Management and soil quantity balance methods for excavated soil and filling soil	Canal alignment: leveling and plant grass at canal sides;	
OPERATION AND MAINTENANCE ACTIVITIES		
Subproject capacity (households or hectare)	Ensure water supply capacity for 410 ha of 3 crops/year area in Ham Minh and Ham Cuong Communes of Ham Thuan Nam District Create water source for supplementing irrigation of 980 ha of dragon fruit in Song Mong-Du Du irrigation area Ensure domestic water supply for 5354 local peoples	
Water treatment process	Use water in Du Du reservoir. The water quality is reliable for irrigation; local people take water for domestic use : washing clothes without treatment , not for cooking	
Periodical canal dredging/pipe cleaning	After each crop season	
RESETTLEMENT AND LAND ACQUISITION[3]		
Affected households		
Number of severely affected APs	0	
Number of APs that must relocate	0	
Total land area to be acquired (ha)	Temporary = 0	Permanent = 0
Agricultural land area to be acquired (ha)	Temporary= 0	Permanent = 0
Forestry land area to be acquired (ha)	Temporary = 0	Permanent = 0
Aquaculture land to be acquired (ha)	Temporary = 0	Permanent = 0
Residential land to be acquired (ha)	Temporary = 0	Permanent = 0
Garden land to be acquired (ha)	Temporary = 0	Permanent = 0
Other land to be acquired (ha)	Temporary = 0	Permanent = 0
SUBPROJECT COST		
Total subproject cost (VND and $USD)	68,070,573,768 VND; 3,241,456 USD (exchange rate 1USD= 21.000 VND)	

[3]This data is obtained from Resettlement Plan

Figure 1: Map of main canal, road and Du Du Reservoir to be upgraded



3 DESCRIPTIONOF EXISTING ENVIRONMENT

Table 2. Environmental baseline

DATA ITEM	SUBPROJECT DATA
PROJECT LOCATION	
Commune(s):	Ham Minh, Ham Cuong Communes
District:	Ham Thuan Nam District
Province:	Binh Thuan province
PHYSICAL ENVIRONMENT CONDITIONS	
Air quality	In subproject area, there is no sign of high dust level: (i) the project is located in rural area without any industrial zone, factory or on-going construction works; there are mainly agricultural and dragon fruit trade activities which will not possibly generate dust at high level.
Noise and vibration	The noise is at low level and only occurs along NH1. Noise sources are traffic means
Climate and natural disasters	The subproject is located in South Centre Coast where has two deeply differentiated dry and rainy season. - Dry season is from May to October, when storm and rainy weather, seriously affecting residents at communes in beneficiary area. - Rainy season is from November to April of next year, accounting for 80÷85% of annual rainfall. - Average temperature: 26,8°C - Average relative humidity: 76,9% - Evaporation: 1,223 mm - Maximum wind speed: Vmax4% = 20.9 m/s - Average rainfall: Xo = 1,335 mm - Maximum rainfall/a day: Xmax = 420 mm (in 1962) Natural disasters include: flooding and erosion during rainy season.
Topography and soils	Subproject area is generally flat, with elevations ranging from 54m to 75m <u>Ham Minh Commune:</u> Total area: 7,187 ha, of which perennial plant: 1,997 ha (1,011 ha of dragon fruit, 58 ha of cashew nut, 473 ha of fruit plant, 455 ha of other plants); annual plant: 1,233 ha (567ha of rice, 30 ha of maize , 636 ha of other plants) <u>Ham Cuong Commune:</u> Total area: 8,225 ha, of which perennial plant: 1,805.96 ha; annual plant: 3,478.19 ha (450.88 ha of rice, remaining land area is foodstuff and other plants) The sub-project area belongs midland area. Subproject land is mainly agricultural land for rice, other crops include maize, cassava, cashew and rubber. The quality of soil is good to ensure agricultural production.
Water bodies	- The subproject area has two main water sources for agricultural production: (i) from Song Mong reservoir for water supply in dry season, (ii) from rivers, streams in the subproject area. - Du Du Reservoir‘s water is received from 2 branches of Phu Sung

DATA ITEM	SUBPROJECT DATA
	river.
Underground water	Consultation result presents underground water quality is not good, polluted by alum Rate of households with access to safe water in the sub-project commune: 100% (mainly from drilling wells, dredging wells) i) Groundwater is at hollow layers; deep well is 5 - 10 m deep from the ground surface. Groundwater level varies by reasons: groundwater level from the ground surface is decreased by 5.0 – 7.0 m in dry season but be increased by 2.0m in rainy season. ii) Currently, groundwater is mainly used for living activities of households: washing cloths and Dragon fruit irrigation (in Ham Cuong Commune) small scale business. Public Consultation's result presents ground water quality is not good, polluted by alum. So that local peoples buy clean water from Ham Kiem Commune for drinking and cooking
Water quality	i) There has been no sign of pollution by lubricating oil The population using ground water for drinking purpose. Water quality of the Du Du Reservoir and main Canal in downstream at Ham Cuong and Ham Minh in the project area is still not polluted, except some section of main canal is polluted by rubbish. ii) There have not been any problems on salinity intrusion for Du Du Reservoir canal system.
Flooding	Flooding often occurs twice a year (mainly flood from September and October). However, the subproject canal is along the mountain slope, which has high terrain, so it is not affected by flooding.
Terrestrial flora and fauna	*Terrestrial flora*: mainly rice field and fruits, dragon fruit and vegetables gardens in residential areas; Along the canal bank, mainly coconut, bushes …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. - Domestic animals like buffalo, cow, pig, chicken, ducks, etc. Terrestrial flora and fauna in subproject area are not listed in Vietnam's Red Data Book.
Aquatic flora and fauna	Aquatic product includes freshwater fish in Du Du reservoir. Aquatic flora and fauna in subproject area are not listed in Vietnam's Red Data Book.
Protected areas	There is no protected area in the subproject area.
SOCIAL ENVIRONMENT CONDITIONS	
UXO	Currently, there is no UXO in beneficiary/ or along the project route.
Land use	Total potential agricultural land is 94,005 ha but only 60% of them is exploited for cultivating. Farming habits of local peoples is specializing in rice cultivation, however currently crops structure was changed from rice to high value crop plants, especially dragon fruit. So that, extension of cultivated land in accordance with adequate crop structure, applying

DATA ITEM	SUBPROJECT DATA
	advance science and technology on agricultural development is necessary. Thus, upgrading of Du Du reservoir & main canal will be meet water use demand for agricultural production with crop structure changing, especially dragon fruit for Ham Cuong and Ham Minh communes under the subproject area
Nearest residential land	Works of the project are located in rural area. Upgraded Du Du Reservoir's dam located on Phu Sung stream that far from residential area thus upgraded main canal runs through the field and be adjacent to residential areas in Ham Minh, Ham Cuong Communes. The nearest residential area is about 30 -50 m away from the canal.
Infrastructure	Rural infrastructure in the Subproject area included: telecommunication system, market, and medical centre…. Commune roads in subproject area are concreted and connected to National Road No 1A No existing infrastructure such as electric power poles, communication works, underground pipelines, other public facilities that can be affected by the canal and by canal construction activities
Agriculture and aquaculture	Agriculture: mainly rice, fruits, sugar-cane, cucumber, bean and industrial trees Aquiculture: fish raising following garden-pond-cage model
Population	Estimated number of beneficiary people: 17,854 peoples (4,123 households) in Ham Minh and Ham Cuong communes which will get benefits from additional supply water source from Du Du reservoir Population density is 105 – 128 persons/km2.
Ethnic minorities	Kinh people are occupying 95 % of total population of the subproject area. Ethnic minority groups only occupied 5 %, including Cham, Raglai, Hoa that living thinly in the subproject area's communes.
Livelihoods	The main employment of the community is agriculture production, mainly dragon fruit & rice. Main incomes of 80 - 90% of the local population are come from agriculture production & dragon fruit. The average income is VND 5.50 million dong/person/year for Ham Minh commune and 5.53 million for Ham Cuong Commune; The level of poverty (following the poverty line made by the Government): number of poor households make up 3.74% of the population in Ham Minh and 4.17 % in Ham Cuong commune, mainly including unsupported older families, single/female headed households.
Physical and cultural heritage	There is no protected area in the subproject area.
Public health	There are some waterborne skin diseases like optical and dental diseases because the Flour content in water exceeds the standard. Diseases which often occur in the summer are diarrhoe, petechial fever Besides, there are respiratory diseases like sore throat, sinusitis, mouth diseases, etc.

4 ENVIRONMENTAL IMPACT SCREENING

Table 3. Environmental impact screening

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Pre-Construction Stage Impacts					
Disturbance of UXO	No				Canal system and cultivation area have been operated for a long time. Consolidation of main canal is based on existing route, thus, there is no possibility of UXO.
Effects on households from loss of the land.	No				There are no land requirements which will be acquired by the subproject
Construction Stage Impacts					

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Erosion or sedimentation during dredging, clearing or earthworks	Yes	Minor	Negative	Temporary	**Description:** 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. The excavated soil will be used for upgrading of management production road along the canal system. Contractor is responsible for waste soil management. Soil from excavation of canal bank fill (water inlet, lateral spillway) not collected causing sedimentation in the canal bed, preventing water flow from main canal into the branches; sedimentation may affect the rice fields and the farming of the local peoples. **Objects** • Cultivated land, rice fields closed by the subproject canals • Local peoples in beneficiary area to be affected indirectly due to water quality may be polluted and affected to their agricultural production **Location**: along the downstream of Du Du dam, main canal to be updated in Ham Minh Commune **Impact scale** is not significant or minor due to excavated volume soil is reused to fill upgraded canal embankment and managed road. The discarded soil needs to be managed by the contractor. **Duration:** during construction (2 years estimated)

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Pollution of waterways, aquatic environments or groundwater from waste, chemicals, effluent or disturbance of contaminated soils	Yes	Minor	Negative	Temporary	**Description:** In the process of pumping out water (from main canal) to dry foundation holes for the canal construction and other works on the canal, oil and grease leakage (from water pump) will generate water pollution. On the other hand, if waste such as discarded soil, sand will not be collected and controlled strictly then it will able to make water turbidity increased. **Location:** along the downstream of Du Du dam, main canal in Ham Minh Commune. **Objects** • The subproject canal's (main canal of Du Du Reservoir) water quality • Local peoples in the beneficiary to be affected indirectly due to water quality may polluted and affected to their agricultural production • Groundwater quality around the subproject canals **Impact level**: is minor because of: (i) the construction is mainly implemented manually, the number of construction machines is small; (ii) the construction is scatted along the canal, thus the concentration of the uncontrolled waste, oil and grease leaking is not remarkable. **Duration**: during construction (2 year estimated)
Changes of water quality due to changes in inlet operation which cause salinity intrusion, aluminiferous water or sedimentation	No				**Description:** Consolidation of the main canal is to increase the initiative of water supply without any changes of work operation which is considered to the reason of water quality change. **Location:** 2 communes under beneficiary area: Ham Minh & Ham Cuong

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Making sensitive flora disappeared and deteriorated	No				**Description:** Supplying sufficient water will not only help increase the agriculture but also increase the humidity of the surrounding environment and give favorable conditions for other green space.
Dust and exhaust fume from construction equipment and machinery	Yes	Minor	Negative	Temporary	**Description:** Dust and exhaust could be generated along the transport routes and on the construction sites. Dust is mainly generated from excavating the main canal, management road, filling the banks of the canals and transporting materials, and from transportation process of construction material. **Location:** along the project route, and transport route such as local roads and National road No. 1A, which keep the distant about 1-2 km from borrow pit to the work site, 16 km from Ham Thuan Nam district center (buying steel, cement…) & 34 km from Tan Ha quarry (buying stone) to the work site & about 22 km from Sand quarry to the work site (buying sand). **Objects**: • The workers on the sites. • Local people in the subproject area living near the upgraded canal & along transport route. **Impact level**: small because number of machinery is small. Dust is mainly from transportation process of construction material. There are only small numbers of households living along construction routes. **Duration**: during construction (2 year estimated).

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Noise caused by construction equipment and machinery	Yes	Minor	Negative	Temporary	**Description:** Noise are mainly generated by construction machines, equipment and material transport, affecting people living along the transport roads and construction sites if these equipment and machines will not be managed properly. **Location:** Along the downstream of Du Du dam, main canal in Ham Minh Commune, and along the project route, and transport route. **Objects**: • The subproject workers. • Local people in the subproject area living along the transport roads. **Impact level:** is minor, because (i) number of vehicles, construction equipment and machinery is not remarkable, therefore, noise level will be under allowed limit level; (ii) there are no resident's areas living along canal routes. **Duration**: during construction (2 year estimated).
Increasing flooding time and scale	No				Canals will take the function on irrigating water for cultivation areas but will not take drainage function, therefore the drainage of the area will not be affected by construction activities.

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Affects on traffic or conditions for asset approaching	Yes	Minor	Negative	Temporary	**Description:** Upgrading Du Du dam will not affect to traffic since all construction works will be taken play on Du Du reservoir area, where local peoples will not allow entering the construction area. Upgrading of main canal will be mainly concentrated on the canal's slope and bed. Construction of the proposed main canals will disturb traffic in the subproject area because the proposed main canals will pass through about 2 km commune roads with a width of 4.0 to 7m for filling soil. Transport activities on 16 to 34 km of district road, National Road No.1 could be affected. In additional, material transportation will be able to affect on movement demand, transporting goods of local people, disturbance to individual households and cause risk for safety traffic. However, management road surface along the canal can be encroached for arrangement of construction equipment and machinery. Therefore, the travelling of residents on canal banks will be limited. **Location**: Main canal goes through Ham Minh Commune and transport routes (district and national roads as mentioned above). **Objects:** Local people in the subproject area (Ham minh commune) living along the transport roads and road users. **Impact level:** is minor due to the canal and management road will be repaired section by section, travelling demands of residents along the canal is not great because most roads serve agriculture purposes but this demands can be greater during harvest period. **Duration**: during construction (2 year estimated).
Causing land losses for households	No				The upgraded main canal for construction is large enough due to one part of land will be reserved for safety space as regulated in dyke ordinance, the living activities of residents will not be affected by construction.

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Affects on infrastructure works like telephone cables, electric cables, etc.	No				**Description:** Consolidation of the Du Du dam, main canal will be constructed following the existing location, route and will not affect the infrastructure works. However, canal and management road construction will affect the travelling of the local residents living near the site, and famers who visit to their rice field that near the Site.
Employment or livelihood benefits from employment of local people	Yes	Medium	Positive	Temporary	**Description**: Local labors (have professional skills and simple labor) will be employed for construction, thus their livelihood/living standard could be remarkably improved thanks to extra works. **Location:** project area and adjacent areas in Ham Minh & Ham Cuong Commune in Ham Thuan Nam District. **Impact duration**: during construction (2 year estimated).
Social impacts by workers at construction site	Yes	Medium	Positive and Negative	Temporary	**Description:** ***Positive***: Cultural exchange between local residents and workers through development of services for workers and construction activities which could bring about benefits to local residents. ***Negative***: The concentration of workers from other regions may cause social evil such as gambling, theft, drug, prostitution, etc. or conflict appears between construction workers and local peoples. **Location**: Ham Minh and Ham Cuong – Ham Thuan Nam District. **Objects**: Local peoples in the subproject area. **Impact level**: These impacts are insignificant because workers will be registered with local police & strict management of Contractor. Impacts will be negligible due to short time for construction (about 1 year). **Impact duration**: during construction (2 year estimated).
Effects on nearby heritage items such as graves, pagodas etc.	No				There are not any heritages, temples, and pagodas near the construction site.

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Risks to public or construction worker health or safety	Yes	Minor	Negative	Temporary	**Description:** Main risks could be listed as the bellowing: - Construction machines and equipment are arranged along the canal, obstructing the travelling of the residents and endangering the traffic, especially during the night time; - There will be the risk of unsafe traffic conditions on the commune road, especially on roads which run through residential areas or intersections; - Dust and noise from material transport will have impacts on daily life of residents living in the subproject area; - There will be the risk of site incidents due to the improper use of equipment and machines; **Location**: Along the primary canal. **Objects**: Residential areas along the transport route and near the canal construction area; **Impact level:** the above risks will be insignificant because (i) the contractor will be requested to control equipment on site; (ii) travel demand on road along the canal is not high and there is substitution communal areas; (iii) material transport will be requested to carry out during day time; (iv) the contractor will conduct training courses on labor safety for workers prior to the subproject commencement; (v) mitigation measures for dust, noise, traffic safety and labour safety will be raised and applied by the contractor. **Impact duration**: following construction time (2 year estimated).

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Generation of spoil/ dredged materials that can be re-used	Yes	Minor	Positive	Temporary	**Description:** Reuse the excavated soil become urgent task of contractors since they want to save construction cost. It is estimated that excavated soil of all types will be 37,700 m^3 and about 80% of excavated soil (30,160 m^3) could be reused for re-filling embankment and management road. **Location**: along primary canal. **Objects**: Local peoples in the subproject area. **Impact duration**: during construction activities, 2 year estimated.
Issues related to waste disposal, including discarded soil generated from construction activities and municipal waste generated from construction tents	Yes	Minor	Negative	Temporary	**Description:** the main issues of waste management could be included: i) discarded soil caused deposits at canal bed, culvert gates and branch canal and ii) domestic waste from worker's camps is not properly collected, transported and treated which may pollute canal. **Location**: construction sites and workers' camp. **Objects** • Air quality in & around worker camps • Water quality of water bodies nearby worker camps • Workers living in the camps **Impact level:** will be minor due to the quantity of discarded soil and deposits of the canal will be small which is estimated that mostly generated from canal embankment activities, number of workers will be few and distributed sparsely along the canal in 2 Packages: Du Du dam & management road; and the main canal & auxiliary work. Therefore, few amount of waste will be generated. **Impact duration**: during construction activities, 2 year estimated.

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Water quality, air quality or land use impact from spoil/dredge disposal sites	Yes	Minor	Negative	Temporary	**Description:** Wet sludge has risk of organic pollution if it is disposed directly in the hollow places, can cause water and air pollution (odor, dust and deterioration quality), affecting people who is living nearby these areas. **Location:** at dumping places in Ham Minh and Ham Cuong communes which are used for discarded soil. **Objects:** Local peoples in the subproject. **Impacts level**: will be Minor. The total amount of waste is estimated 7,540 m^3. This volume will be preliminary treatment before reuse with drying method at site. **Impact duration:** during construction activities, 2 year estimated.
Impacts on irrigation activities for agriculture production	Yes	Minor	Negative	Temporary	**Description:** Construction of main canal requires dry construction area, meaning the water flow will be stopped in the existing canal. There will be a conflict between water demand for agriculture and construction demand during cultivation period and construction time. **Location**: Main canal and downstream cultivation area. **Objects** • Rice/ dragon fields irrigated by the subproject canals. • Local peoples/farmers using water supply by the project canals. **Impact level:** small as Irrigation schedule could be changed flexibly to construction time. (Construction time should be the same time that Du Du Irrigation System stop water supply for major repairs or after harvesting Summer-Autumn Crop & before starting Winter-Spring Crop, and therefore this impact could be mitigated and impact level is considered at small level. **Impact duration**: As per crop water supply schedule and construction time; expected within 24 months during construction time.
Impacts in operation stage					

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Vegetables and trees areas will be flooded due to soil filling and operation of irrigation canal	No				Completion of of Du Du dam, main canal in Ham Minh & Ham Cuong commune will ensure the irrigation capacity of 410 ha for 3 crops/year in Ham Minh and Ham Cuong Communes; Create water source for supplementing irrigation of 980 ha of dragon fruit in Song Mong-Du Du irrigation area; Ensure domestic water supply for 5354 local peoples in Ham Minh and Ham Cuong Communes, Ham Thuan Nam District Regulation works in these canals have adjusting valves to control the water level; therefore, there will be no risk of flooding situation on cultivation areas.
Excessive exploitation of surface water and groundwater will make water supply capacity cannot catch up with demands and/or cause conflicts among households	No				Reasonably exploit water source following approved design assignments (irrigation capacity has not reached the maximum rate as designed capacity ; Further increase the water supply capacity to meet demands of users, especially dragon fruit area which has not been supplied with water for a long time from the project site; Accordingly, conflicts among households will be remarkably reduced;
Water is exploited at sensitive ecological places/or reservation areas	No				There is no sensitive ecological places/or reservation areas;
Changing living conditions and/or public health thanks to improved water supply	Yes	Significant	Positive	Permanent	Changing living conditions and/or public health thanks to improved water supply, which could improved the cultivated capacity and productive for whole beneficiary area. The main fist benefit groups will be local peoples in the subproject area Impact level could be significant due to living conditions is improved thanks to provision of enough water for extension of cultivated land; especially dragon fruit

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Productivity is improved by increase of irrigation capacity	Yes	Significant	Positive	Permanent	The project, which includes reservoir and main canals, will help to improve irrigation capacity in the project areas. The cultivation area is increase, water supply is initiative and productivity and output are increased. Finally, which could help to improve living standards of local people.
Cultivation habits will be changed due to the turning of land use for agriculture purposes	Yes	Significant	Positive	Permanent	Agriculture area is increased (mainly annual trees need to be irrigated with water) thanks to supplying sufficient water, land structure will be changed following extensive cultivation, cultivation productivity increase; accordingly cultivation habits as changed from rice to high value crop plants, especially dragon fruit
Leaching nutrition from soil or salinity of soils due to excessive irrigation (not following irrigation regimes and specifications);	Yes	Minor	Negative	Permanent	**Description:** There is not statistics or research in the area regarding the percentage loss of nutrients. Actually, the rate of soil nutrient loss is very small due to the cultivation in the plain with small slope that can not cause drift of soil when it rains or excessive irrigation. After the irrigation canal is complete, the regulating system will be facilitated and more flexible, hence, the land will not lose nutrients due to excessive irrigation; **Location:** beneficiary area **Objects**: Soil quality of cultivated land and local peoples in the subproject area **Impact level**: is small due to famers in the project area will be trained on irrigation method properly in agriculture.
Soil erosion or scouring of streams or canals or application of irrigation water on sloped land	No				The canal is reinforced by concrete so that soil erosion and land slide will not occur;

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Affecting water quality due to the increased quantity of fertilizer or pesticide or chemical substances or waste water	Yes	Minor	Negative	Permanent	**Description:** After upgrading Du Du dam & main canal, 410 ha for 3 crops/year in placed of 1 -2 crop and 980 ha of dragon fruit will be irrigated substantiality. Consequently, the quantity of pesticides or chemical fertilizers will be increased. The amount of pesticides on field surface and drainage system will affect the quality of agricultural land and irrigation water, possibly groundwater. The risk will increase if the management of pesticides is not reasonable. **Location:** Benefit area: 410 ha of rice & 980 ha of dragoon **Objects:** Water quality of the subproject canal & others water bodies around the subproject area **Impact level:** is small due to famer will be trained & applied IPM method
Risks caused by natural calamity	Yes	Minor	Negative	Permanent	**Description:** Natural calamity which is often encountered are drought, flooding. This will have serious affects on resident life as well as economic growth in the region. **Location**: Benefit area: **Objects**: Canals and local peoples in the subproject area **Impact level**: will be small, the directly impacts on canal is minor because its position in paddy & dragon fruit field, not directly suffered from river or dynamic flow damage;
Changing the service approaching ability of local residents thanks to building approaching road for the work	Yes	Significant	Positive	Permanent	3.9 km of management road along the main canal in connection with existing traffic road network will increase the approaching ability of local residents to services from markets, areas for commodity and agriculture product exchange, especially dragon fruit trade.

IMPACT	POTENTIAL IMPACT				BRIEF DESCRIPTION OF IMPACT LOCATION AND SCOPE
	YES/ NO?	IS IT MINOR OR SIGNIFICANT ?	IS IT POSITIVE OR NEGATIVE?	IS IT TEMPORARY OR PERMANENT?	
Congested irrigation canal causes flooding	Yes	Minor	Negative	Temporary	**Description:** Irrigation canal system is congested due to improper operation of regulation culverts in canal or obstruction of rubbish, affecting the water conveyance. Water overflow in canal and partial inundation may occur along canals and affect cultivation activities. **Location**: along the main canals. **Objects**: Local peoples in the subproject area. **Impact level**: minor because Binh Thuan Irrigation Exploitation Enterprise will take the responsibility for waste collection and treatment.
Affects on employment and livelihood	Yes	Significant	Positive	Permanent	Employment and jobs will be diversified thanks to the increase of project effectiveness.
Impacts on ethnic minorities	No	No	No	No	No ethnic minority living within project area.
Soil erosion and land slide in canal	No	No	No	No	Because of concrete canal, collapse of embankment only occurs at dyke slope; the collapse is mainly attributed by rainwater.

5 OUTLINE ENVIRONMENTAL MANAGEMENT PLAN (EMP)

5.1 Environmental Mitigation Plan

Table 4. Environmental mitigation plan

POTENTIAL IMPACTS	MITIGATION MEASURES	RESPONSIBILITY	COST
Pre-construction stage			
Environmentally Responsible Procurement	▪ Environmental requirements need to included in tender documents to ensure that mitigation measures are budgeted and to prepare the contractors for environmental responsibilities. ▪ Specify in bid document that Contractors shall engage capable and trained staff or site agent(s) to take responsibility for the environmental management and safety issues at the working level and to monitor the effectiveness and review mitigation measures as the sub project proceeds. Contractors recruit qualified staff to oversee implementation of environmental and safety measures specified in the EMP. ▪ Any recent recommendations and initiatives from DONRE or other local environmental authorities will be incorporated in the EMP and updated as necessary.	Design Consultant, Binh Thuan PPMU	Included in the contract
Construction materials management planning	As planed in design documents, the main construction material will be taken from existing quarries as: ▪ Cement, steel, formwork will be bought in Ham Thuan Nam District located in distance 16 km from the subproject site ▪ All types of stone will be bought in Tan Ha quarry in Ham Tan district, about 34 km to the subproject site ▪ Sand will be taken in sand quarry No 37 in Ham Thuan Nam District, about 22 km to the subproject site ▪ Red gravel will be exploited in the Area of Du Du reservoir belongs to the owner. This is existing red gravel ground under the Owner ‘s management . Contractor will exploit this under agreement with the Owner This exploited activities need to comply with environmental requirements as bellow: ▪ Working machines must be under periodically quality controlled; ▪ Oil and other chemical pollutants from working machines should be strictly controlled and stored separately, avoiding leakages; ▪ Workers should use protective equipment while working within the Site; ▪ Fence should be erected surrounding the working area to prevent intrusion by cultivators, local people or animals; ▪ Temporary earth drainage system and ditch	Design Consultant, Binh Thuan PPMU	Included in the contract

POTENTIAL IMPACTS	MITIGATION MEASURES	RESPONSIBILITY	COST
	should be formed to store waste water safely in rainy season to reduce turbidity before releasing water into Phu Sung stream ▪ Water should be regularly sprayed within graves ground to reduce dust generation. Borrow area will be exploited in Ham Minh Commune, about 1-2 km to the site. In case that, above material sources will be change, an appropriate material management plan should including the following: ▪ Required materials, potential sources and estimated quantities available; ▪ Material supply manners: preferring to purchase from existing material quarries. ▪ Agreement with the local authorities ▪ Check with environmental permission/certification of the quarries to ensure that owners have considered environmental impacts and mitigation measures. ▪ Environmental recovery plan ▪ Material transportation manner plans and schedules.		
Plan Spoil and Waste Disposal	▪ Re-use of waste materials & spoil disposal locations included in bid and contract documents. ▪ Select an properly treatment manners, preferred of for fill up the site of other projects activities/purposes ▪ Determine waste materials & spoil disposal locations. The expectation is that construction waste will be stored temporarily along the proposed road, domestic waste will be stored in rubbish bins and then will be collected and treated by the local authority at Ham Thuan Nam landfill and contractors will be responsible for paying the bill ▪ Agreement with the local authorities need to be obtain during detail design or before starting construction activities; ▪ Environmental recovery plan since construction activities completed ▪ Waste materials transportation manner plans and schedules ▪ Establishment of complaints management system for duration of the works	Design Consultant, Binh Thuan PPMU	Included in the contract
Effects on households from loss of agricultural land	No household to be relocated and no land to be acquired by the Subproject		
Environmental recovery	▪ Before construction is completed, the contractor will move all construction wastes and unused materials from the sites to approved sites ▪ Monitoring environmental recovery at working	Contractor	

POTENTIAL IMPACTS	MITIGATION MEASURES	RESPONSIBILITY	COST
	sites, worker's camps, construction waste disposal location, material stores. ▪ Monitor survival of trees / shrubs and grass in bioengineered slopes (e.g. at landslides, also transplanted / compensatory planting trees) and replant, as necessary.		Included in the contract
Construction stage			
Erosion or sedimentation caused during dredging, clearing or earthworks	▪ Install sediment dyke and/or sediment traps around the temporary excavated material area to collect sediment before it enters waterways; ▪ Construct temporary drainage canal for reducing affects on residential area in Ham Minh & Ham Cuong communes; ▪ Minimize area of land clearance and duration of works within this area; ▪ Undertake progressive re -vegetation of land clearance areas; ▪ Avoid clearing activities during the rainy season where possible.	Contractor	Included in the Contract with the Contractor
Pollution of waterways, aquatic environments or groundwater from waste, chemicals, effluent or disturbance of contaminated soils	▪ Store chemicals in safe area, with concrete floor and weatherproof roof and away from Phu Sung Stream and the main canal. Ensuring construction equipment and vehicles are maintained in good conditions; ▪ Install sanitary toilets and washing facilities at construction camps; ▪ Collect debris, sludge regularly from the site for disposal to Ham Thuan Nam landfill.	Contractor	Included in the Contract with the Contractor
Changes of water quality due to changes in inlet operation which cause salinity intrusion, aluminiferous water or sedimentation	▪ Dredge all mud soil, sediments in the main canal before supplying water to avoid deposits going to the level 1 branch canal from K 1+863.2 to K4+860; ▪ Dredge and collect affected mud to cultivation area, travelling road (if any).	Contractor	Included in the Contract with the Contractor
Dust and exhaust emissions from construction equipment	▪ When transporting construction materials, implement strictly dust suppression measures such as watering of exposed surfaces and covering the trucks with canvas; ▪ Ensure all construction vehicles and equipment are well maintained; ▪ Watering the road surface based on a daily watering in the residential areas.	Contractor	Included in the Contract with the Contractor
Noise generation from construction equipment	▪ Ensure all construction vehicles and equipment are well maintained; ▪ Limit construction activities which can make noise in night time; ▪ Inform local communities of schedule and duration of construction works; ▪ Receive opinions and feedbacks from the community.	Contractor Supporting group for ward subproject/ Contractor Commune PC/ ward PC/ PPMU	Included in the Contract with the Contractor Local budget for community

POTENTIAL IMPACTS	MITIGATION MEASURES	RESPONSIBILITY	COST
			monitoring activities
Affects on traffic or conditions for property access	▪ Inform community near the sub-project area about construction time and schedule; ▪ Limit construction activities on main roads and avoid implementing construction at rush hours. ▪ Install signal lamps and sign panels at crossing points with road branches. Limit the speed of means of transport on the route; ▪ Build bypass roads to facilitate people's traveling, if needed; ▪ Notify nearby community of schedule and duration of construction.	Contractor Contractor/ Supporting group for ward subproject Contractor	Included in the Contract with the Contractor
Social impacts by workers at construction site	▪ Consult local authorized staff to prepare house renting plan for workers at the same local area; ▪ 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 training 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; ▪ Implement communication of prevention of HIV/AIDS and sexually transmitted diseases and dissemination on social evils like drugs, gambling, prostitution, violence, stealing, etc. ▪ Delivery condoms to workers	Contractor PCs at all level, bureau of social evil prevention, Center of HIV/AIDS prevention and Center of Contingency Medical/Committee of HIV/AIDS prevention at commune/ward levels and at other levels / NGO	Included in the Contract with the Contractor Relevant programs under local budget such as HIV/AIDS and social evils prevention
Risks to public or construction worker health or safety	▪ Provide safety equipment to workers like mufflers, gloves, safety belt and train them in its use. Fist add kit always ready at the Site ▪ Regularly implement working inspection to ensure working safety in the construction area; ▪ Secure construction site and restrict access by local community by arranging warning signs and fencing wall; ▪ Inform residents about possible incidents or risks during construction by louder speakers.	Contractor Contractor Construction management and Environmental management contractor	Included in the Contract with the Contractor
Issues related to waste disposal, including discarded soil generated from construction activities and municipal waste generated from construction tents	▪ Establish temporary latrines which meet regulations of Health Ministry and supply enough water for using ▪ Collect solid wastes and temporarily store them at a safety place before transporting them to disposal sites	Contractor	Included in the Contract with the Contractor
Impacts related to water quality, dust or	▪ Re-use as much as possible dredged soil and limit transportation them to disposal Site. ▪ In case of discarded soil will not be reused,	Contractor	Included in the Contract with the

POTENTIAL IMPACTS	MITIGATION MEASURES	RESPONSIBILITY	COST
land using customs	Contractor should transfer discarded soil to disposal sites following acceptance from PPC or DPC. Before construction implementation, Contractor should clearly define disposal sites location and signing a contract with disposal site for disposal of discarded soil.	PPMU/ Contractor	Contractor
Impacts on irrigation activities for agriculture production	▪ Construction of primary canal should be implemented in dry season with application of construction and irrigation at same time. ▪ The Contractor should coordinate with irrigation authority (irrigation exploitation management enterprise, commune's irrigation staff and cultivation households in water supply area of the main canal to reach agreement on water supply duration (construction suspension), construction time (should be implemented at the time when irrigation activities are not done); ▪ Commune's irrigation staff, irrigation exploitation enterprise or relevant authorities should soon inform households and contractor water supply schedule cultivation so that they can make plan on their own initiative; ▪ PPMU and the Contractor should pay attention to mitigation measures to reduce damages or to implement compensation for arising impacts due to stop of water supply at cultivation area, etc ▪ Proposed construction time: after harvesting: 1 July 2015 to 31 December 2015. Construction solution is construction time should be implemented at the time when irrigation activities are not done. ▪ To implement stop of water supply alternatively, e. g water supply for 10 days, construction for 15 days.	PPMU/ Contractor; Irrigation Contractor, Irrigation management enterprises of province, commune authorities and local residents in Ham Minh & Ham Cuong communes	Included in the Contract with the Contractor
Operation stage			
Leaching nutritive substances or salinity of soil disappeared due to excessive irrigation	Coordinate with agriculture authority to ensure that farmers are trained on proper irrigation method;	Agricultural extension center of the province	Local budget
Soil erosion or land slide caused by streams or canals or irrigation at slopes	▪ Regularly implement monitoring and cleaning at congested canals; ▪ Coordinate with agriculture promotion center to ensure that farmers are trained on cultivation method at slope land area.	PPMU Provincial Irrigation Management Company Agricultural extension center of the province	Local budget
Affecting water quality due to the increased quantity of	▪ Coordinate with agriculture authority to ensure that farmers are trained on irrigation method; ▪ Solid waste from pesticide, insecticide as well		Local budget

POTENTIAL IMPACTS	MITIGATION MEASURES	RESPONSIBILITY	COST
fertilizer or pesticide or chemical substances or waste water	as other substance such as herbicide should be stored in tanks at cultivation area before transport to disposal sites; ▪ Ensure weed and other floating waste are periodically cleaned along the canal; ▪ Coordinate with Agriculture Extension Center to ensure that farmers are trained on Integrated Pesticide Management (IPM).	DARD	
Risks of natural calamity	▪ Ensure that subproject design will meet all safety standards on prevention of flooding, storms and other potential natural calamity. ▪ Reservoir management unit must closely coordinate with Natural Calamity & Flooding Prevention Committee in the local area to timely find out assistance methods.	PPMU	Local budget
Congested irrigation canal causes flooding	Ensure that canal is regularly inspected and maintained.	Provincial Irrigation Management Company	Local budget

5.2 Environmental Monitoring Plan

5.2.1 Environmental effects monitoring

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

Table 5. Environmental effects monitoring plan

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
Construction stage						
Minimization of noise generation	Noise level	At nearest residential areas from the main canal & interchange points between NH 1A (transportation road) and commune road at Communes: Ham Cuong and Ham Minh	Initially observation, use of noise meter to measure dB(A) if high noise levels observed Visual Observation or complain from local people	Weekly or receiving feedback from local communities	Contractor	Included in the contract
				Weekly or receiving feedback from local communities	Construction Supervision Consultant (CSC)	Included in separated contract with PPMU
				Every 6 months during construction period or	Monitoring consultant on environmental safeguard policies of LIC	Included in separated contract with

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
				when community's feedback is raised	team	CPMU
Minimization of dust generation	Dust concentration	At nearest residential areas from the main canal & interchange points between NH 1 A (transportation road) and commune road at Villages:	Visual Observation; Sampling and analysis if high dust level are observed or complain from local people	Weekly or receiving feedback from local communities	Contractor	Included in the contract
				Weekly or receiving feedback from local communities	Construction Supervision Consultant (CSC)	Included in separated contract with PPMU
				Every 6 months during construction period or when community's feedback is raised	Monitoring consultant on environmental safeguard policies of LIC team	Included in separated contract with CPMU
Control of surface water quality	Sedimentation, rubbish, lubricating oil and solid waste	At the beginning of branch canal route, near the construction site of main canal	Visual Observation; Sampling and analysis complain from local people	Weekly or receiving feedback from local communities	Contractor	Included in the contract
				Weekly or receiving feedback from local communities	Construction Supervision Consultant (CSC)	Included in separated contract with Binh Thuan PPMU
				Once every 6 months during construction or in case of at any time or in case of complaints of residents	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU
Control of irrigation capability	Meet irrigation demands following the agreed irrigation schedule	At division gates from the main canal	Consider harvest time and discuss with local residents within subproject	Once every 6 months during construction or in case of at any time or in case of	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
			area	complaints of residents		
				Following regional cropping water demand	Local residents, Community Monitoring Board Irrigation official in local area (commune)	Local budget Without marginal cost
Cleaning camps	Waste water volume, the cleanliness of camps	Camps on site	Observation and community consultation	Weekly or when community's complaint is raised	Local residents, Community Monitoring Board	Included in the Contract
				Weekly or receiving feedback from local communities	Construction Supervision Consultant (CSC)	Included in separated contract with Binh Thuan PPMU
				Once every 6 months during construction or in case of at any time if necessary	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU
Labor safety and public safety	Number and frequency of using labor safety devices; System of warning signs Compliance of traffic law of transport means	At canal area; On transport route	Observation and community consultation	Weekly or when community's complaint is raised	Local residents, Community Monitoring Board	Without marginal cost
				Weekly or receiving feedback from local communities	Construction Supervision Consultant (CSC)	Included in separated contract with Binh Thuan PPMU
				Once every 6 months during construction or in case of at any time if necessary	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU
Sludge and discarded soil	Ordor, colour of discarded	At 2 expected dumping yards in Ham Minh and Ham Cuong	Observation and community consultation	Weekly or when community's complaint is	Local residents, Community Monitoring	Without marginal cost

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
	soil and other visible	Communes		raised	Board	
				Weekly or receiving feedback from local communities	Construction Supervision Consultant (CSC)	Included in separated contract with Binh Thuan PPMU
				Once every 6 months during construction or in case of at any time if necessary	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU
Operation stage						
Using irrigation water	Conflicts during water source access as mentioned in report	At division gate for cultivation areas of commune; Cultivation area at upstream of main canal and downstream of main canal	Observation and community consultation	Once every 6 months in first 2 years of operation	DARD of province; Binh Thuan Irrigation Management Company; irrigation official of commune, households	Included in operation cost of Binh Thuan Irrigation Management Company
Surface water quality	Sedimentation, rubbish, lubricating oil and solid waste	Location: Total 4 points 1 point at reservoir & 1 point at downstream of dam 2 points : starting & ending points of upgraded main canals	Observation and community consultation Or sampling methods following Vietnamese standard when receiving feedback from communities	Twice a year in two first years of operation (1 time in rainy season and 1 time in dry season)	DARD, Binh Thuan Irrigation Management Company	Included in operation cost of Binh Thuan Irrigation Management Company
Waste management	Conditions on environmental sanitation within project area; temporary waste storage yard	Throughout subproject area	Observation and community consultation	Once every 6 months in first 2 years of operation	Binh Thuan Irrigation Management Company	Budget provided following regulations at Decree No.115
Periodical dam & canal	Level of canal sedimentatio	At Du Du dam & Along the main canal	Field survey, community consultation	Once every 6 months in first 2 years	DARD/ Binh Thuan Irrigation	Local budget

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
maintenance	n and conditions of sluices, equipment and works on the main canal			of operation	Management Company	
Re-occupation of canal corridor	Occupation area, type of occupation (for planting trees or other purposes)	Along the main canal	Field survey, community consultation	Once every 6 months in first 2 years of operation	DARD/ Binh Thuan Irrigation Management Company	Local budget

5.2.2 Environmental Compliance Monitoring

Environmental compliance monitoring is carried out to test compliance with operating procedures, technical standards and/or contractor specifications in the EMP.

Table 6. Environmental Compliance Monitoring

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
Pre - construction Stage						
Environmentally Responsible procurement and SEMP preparation	Inclusion in bid docs	All canal alignment	Checking documents	Bid preparation, before start of civil works	PPMU	Project preparation
Plan construction materials management	Meting minutes and agreement with local authorities	All canal alignment	Checking documents	Prior to start of site works and throughout construction phase	PPMU	Project preparation
Plan Spoil and Waste Disposal	Meting minutes and agreement with local authorities	All canal alignment	Checking documents	Prior to start of site works and throughout construction phase	PPMU	Project preparation
Construction Stage						
Control of soil erosion and sedimentation	Ensure that soil erosion and sedimentation will not occur in construction site	Throughout the construction site	Observation and community consultation	Weekly and after heavy rain events	Construction Management-and-Environmental Management Consultant Local Community Monitoring Boards	Without marginal cost Local budget
				Once every 6 months during construction or in case of at any time if necessary	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
Storage of materials	Condition of materials storage areas	Throughtout the construction site	Observation and community consultation	Weekly	Construction Management-and-Environmental Management Consultant Local Community Monitoring Boards	Without marginal cost Local budget
				Once every 6 months during construction or in case of at any time if necessary	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU
Construction equipment and vehicles	Noise and exhaust generation; covering of trucks; oil/fuel leakage	Throughout construction site	Observation and community consultation	Weekly	Construction Management and Environmental Management Consultant Local Community Monitoring Boards	Without marginal cost Local budget
				Once every 6 months during construction or in case of at any time if necessary	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU
Construction camp conditions	Cleaning waste treatment; general conditions	At all camps	Observation and community consultation	Weekly	Construction Management-and-Environmental Management Consultant	Without marginal cost
				Once every 6 months during construction or in case of at any time if necessary	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
Property access	Rehabilitate the possibility of temporary and fixed access	Affected assets: roads in commune and affected assets during construction	Observation and community consultation	Once during construction works and once after finishing construction	Construction Management-and-Environmental Management Consultant Local Community Monitoring Boards	Included in the Contract Local budget
				Once every 6 months during construction or in case of at any time if necessary	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU
Risks to health and safety of local people and construction workers	Check implementation of all items Check compliance to Labour Code of Vietnam, Decree 06/1995/ND-CP 20/1/1995, Decree 110/2002/ ND-CP 27/12/2002 and Circular 19/2011/TT-BYT 6/6/2011	Throughout construction site	Checking document, observation and community consultation	Weekly	Construction Management-and-Environmental Management Consultant Local Community Monitoring Boards	Without marginal cost Local budget
				Once every 6 months during construction or in case of at any time if necessary	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU
Waste disposal	Environmental sanitation at construction site and temporary waste storage area	Throughout construction site	Waste disposal	Weekly	Construction Supervision Consultant	Included in the contract signed with CSC and LIC
				Every six months	Environmental Specialist of LIC Team	
Impacts on irrigation activities	Check implementation of all items	Throughout construction site	Checking documents, observation	Weekly	Construction Supervision Consultant	Included in the contract signed with

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
			and community consultation	Every six months	Environmental Specialist of LIC Team	the CSC and LIC
Areas of standing water	Ponded or undrained water	Throughout construction site	Observation and community consultation	Weekly during rainy season	Construction Management and Environmental Management Consultant Local Community Monitoring Boards	Without marginal cost Local budget
				Once every 6 months during construction or in case of at any time if necessary	Monitoring consultant on environmental safeguard policies/LIC	Included in separated contract with CPMU
Environmental recovery	Check implementation of items	Throughout construction site	Checking documents, observation and community consultation	Every six months and after completing each item	Construction Supervision Consultant/ Environmental Specialist of LIC Team	Included in the contract signed with the CSC and LIC
Operation stage						
Using irrigation water	Using matter	Households near canals	Observation and community consultation	Once every 6 months in first 5 years of operation	PPMU/Binh Thuan Irrigation Management Company	Budget provided following regulations at Decree No.115
Soil erosion or land slide in canal	Conditions of canal; level of sludge in water	At sections which have not be rehabilitated	Observation	Once every 6 months in first 2 years of operation	PPMU/Binh Thuan Irrigation Management Company	Budget provided following regulations at Decree No.115
Prevention of soil erosion and land slide in canal	Conditions of canal bank	At some representative locations in subproject area	Observation and community consultation	Once every 6 months in first 2 years of operation	PPMU/Binh Thuan Irrigation Management Company	Budget provided following regulations at Decree No.115
Waste management	Conditions on environmental sanitation	Throughout subproject area	Observation and community	Once every 6 months in first 2 years	PPMU/Binh Thuan	Budget provided following

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility	Cost
	within project area; temporary waste storage yard		consultation	of operation	Irrigation Management Company	regulations at Decree No.115

5.3 EMP Implementation Arrangements

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 Binh Thuan PPMU Safeguards Officer on EMP implementation during construction Monitor progress during construction Consolidate Binh Thuan 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
Binh Thuan 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
Binh Thuan DONRE	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
Binh Thuan 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 bid 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
District 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

Organization	Roles and Responsibilities		
	Subproject Preparation	**Subproject Implementation**	**Subproject Operation**
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 Supervision Boards (CSBs) and local community members[4]	Involvement in consultation and participation activities to identify and develop subprojects Ability to comment on environmental assessment documentation upon disclosure	Involvement in environmental monitoring activities under the direction of SSTs	Involvement in 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

[4] CSBs have been established under Decree 80 Regulation for Participatory Investment Supervision. Article 8 of Decree 80 provides the community with opportunities to inspect compliance, monitor implementation and evaluate the results of investments in the commune, including environmental impacts.

5.4 Monitoring and Reporting System

Table 8. Monitoring and Reporting System

Project Phase	Type Of Report	Frequency	Responsibility	Submitted To Whom
Construction	**EMP of subproject**	Once/ (first month since construction beginning	Construction contractor	PPMU/CPMU
	EMP implementation report of province (syntheses of construction package) according to report sample approved by ADB	Quarterly	Binh Thuan PPMU	CPMU
	EMP Compliance Report indicating compliance with subproject EMP and monitoring results	Once/ 6 month	Binh Thuan PPMU/LIC	ADB/AFD/DONRE
	EMP implementation report of each package/ subproject according to report sample approved by ADB	At completion of subproject	CSC (to hold Environmental Supervision Consultant)	CPMU
	Subproject Environmental Report indicating overall subproject environmental performance and EMP compliance	At completion of subproject	Binh Thuan PPMU	CPMU
Operation	**EMP Compliance Report: Operation** indicating compliance with subproject EMP commitments during operation	6 monthly for first two years of operation. Ongoing frequency to be determined based on review after 2 years.	Project owner	ADB, DONRE, MONRE

5.5 EMP Budget

Table 9. EMP Budget

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 (CMC To hold Environmental Monitoring)/	Included in management cost of Binh Thuan PPMU	Included in the Contract with Contractor and CMC 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
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)*				

6 PUBLIC CONSULTATION AND DISCLOSURE ACTIVITIES

6.1 Description of Activities to Date

Table 10. Public consultation and public disclosure activities

CONSULTATION METHOD	DETAILS OF ACTIVITIES	
Correspondence and meetings with local authorities (District and Commune PCs, Commune Fatherland Front, Women's Union, Youth Union and others)	Date of correspondence	02 /04/ 2024
	Dates of meetings (if requested)	5/08/2014
	Minutes of meeting attached (Yes / No)	Yes
Public meetings	Date(s) held	5/08/2014
	Location(s) held	PC's meeting hall and cultural house of Ham Cuong and Ham Minh communes
	Invitees	Commune PCs, stakeholders, village heads, Young Communist League, Fatherland front, Farmer Association, Women Union of the communes.
	Methods of invitation	Radio announcement and letter, coordinate with Women Union to mobilize women's participation in meetings
	Agenda attached (Yes / No)	Yes
	Minutes of meeting attached (Yes / No)	Yes
	Number of participants	Total were 61 people Man: 32 people Women: 29 people (The list of participants will be closed in the minutes of consultation)

6.2 Outcomes of Public Consultation to Date

Table 11. Results of public consultation

Description of Issue Raised	By Whom?	Required Follow-up Actions?
Road damage	Local people	Make sure contractor use trip trucks with a capacity of under 10 tons.
Traffic disturb when transporting material and constructing & raising Du Du Dam, main canal, especially in route of commune road through residential area in Ham Cuong and Ham Minh	Local people & The Women's Union	Do not transport materials at rush hours (6 am to 7 am; 11 am -12 pm; 5 pm- 6pm) Material transportation trucks run with allowed speed; set up fully signboards on the site.
Disturb of water supply for	Farmer Association	▪ To built temporary diverted canal & temporary culvert to irrigate for

Description of Issue Raised	By Whom?	Required Follow-up Actions?
irrigation		downstream of Du Du Dam ▪ The Contractor should coordinate with irrigation authority (irrigation exploitation management enterprise, commune's irrigation staff and cultivation households in water supply area of the main canal to reach agreement on water supply duration (construction suspension), construction time (should be implemented at the time when irrigation activities are not done);
Construction workers cause social disruption and sanitation problems	Vice chair man of Ham Cuong CPC & The Women's Union	▪ Register temporary residence card for workers; ▪ Request workers to collect waste as regulation and ensure that their construction camps are maintained in clean and hygienic conditions. ▪ Associate closely with local government during construction

6.3 Future Public Consultation Activities

Table 12. Proposed community consultation activities

Activity	Participants	Expected Outcomes	Schedule	Cost Estimate
Kick-off meeting prior to construction commencement	PMU, the Contractor, CMC, community representatives at project area	- Publicize construction contents and plan - Reach agreement on detailed mitigation alternatives (especially the time of water supply stop for construction)	1 week prior to construction commencement	3,000,000
Periodical meetings	The Contractor, CMC and representatives of local authority, organizations and community at project area	- Periodically check mitigation activities and arising problems - Propose treatment alternatives and reach agreement on implementation	Once every 3 months from construction commencement	3,000,000

7 CONCLUSION AND RECOMMENDATIONS

1. Du Du Reservoir upgrading Subproject will be implemented by PMU of IRDPCP additional financing, which is located in Ham Cuong and Ham Minh Communes of Ham Thuan Nam District Binh Thuan province.

2. **Project environmental assessment implemented and main potential environmental impacts of subproject in construction stage**

(i) Dust and exhaust emission from construction equipment and machinery, material transport and material mixing. Pollution mainly occurred along transport route and at the construction site; it is necessary to have mitigation measures for negative impacts;

(ii) Noise pollution due to construction motorbikes and material transport means;

(iii) Surface water quality could be affected as results from excavation and leveling activities.

(iv) Solid waste and liquid waste pollution from excavation, material mixing, residue of gasoline and lubricating oil from tents;

(v) Conflicts between agriculture water supply for irrigation area and water supply stop.

(vi) Traffic disturb when transporting material and constructing the management /production road/canal embankment

3. Main potential environmental impacts in operation stage

(i) Agriculture wastes (residue of vegetables, pesticide cover, straw of cultivation area) from the boundaries of the main canal have been focus at the canal bed, obstructing and polluting the flow;

(ii) Affecting water quality due to the increased quantity of fertilizer or pesticide or chemical substances

4. Mitigation measures and construction monitoring for subproject, including the following main activities

Mitigation measures for negative impacts caused by project could be includes as the following:

(i) Reduce soil erosion, sediment, land slide due to excavation, it is necessary to restore the vegetation covers, implement site clearance like planting grass, trees for shadow,

(ii) Minimize soil/water pollution, exhaust pollution, rubbish, and chemical substances during construction by methods like using equipment and vehicles in good conditions; erecting tents and latrines for workers in conformity with standard; implement cleaning and dredging at polluted areas, excavate to create holes for burying rubbish. If necessary, community at downstream should be informed about water quality changes,

(iii) Dust, smoke and noise from construction equipment and vehicles: reduce the time and construction area/ transport vehicles, construction materials must be covered by canvas; limit the noise from construction equipment at rush hours, at nights/labour safety devices for workers,

(iv) During exploitation process, management authority should disseminate and consult the local authority/water users to limit the excessive use of water; establish regulated procedures and detailed water supply plan; update information year by year to inform users, implement dissemination and training on scientific irrigation to the community for understanding and implementation,

(v) The Contractors do not transport materials at rush hours (6 am to 7 am; 11 am - 12 pm; 5 pm- 6pm) and to be supposed to slow down when transporting materials by the residential area and to plan construction signposts and speed limit signs

(vi) Avoid deteriorating soil/water quality by fertilizer and pesticide through coordination and involving in agricultural encouraging programs, water management with participation of residents, etc.

Monitoring measures

(i) Contractor shall have methods and commitment on implementation of mitigation measures in aspects of both implementation location/mitigation measures/and frequency of implementation. Concurrently, the Contractor shall prepare detailed plan on environmental monitoring and mobilize enough manpower to meet general requirements and compulsory regulations on EMP.

(ii) During operation stage, Irrigation Management Unit of work operation should implement periodical monitoring on water quality following current standards of Vietnam.

(iii) PPMU should enhance monitoring the conformity of environmental regulations of the Contractor and coordinate with local authorities in preparing and implementing environmental management plans.

5. Conclusion and recommendations

Investment and construction of Du Du Reservoir upgrading subproject is to promote the irrigation effectiveness of Du Du reservoir, improve living standard and eliminate poverty for 2 communes: Ham Cuong and Ham Minh in beneficiary areas with population of 17,854 peoples. Reducing natural calamity is an essential and urgent matter which helps bring significant economic effect and contribute to state-oriented agricultural and rural development.

It is shown from environment study of this project that environmental problems are mainly generated from construction process and considered to be temporary impacts and locally;

After the work is put into operation, environmental problems, which have been encountered such as soil erosion in canal and long-term flooding due to poor drainage capacity, will be overcome, then, living conditions and environment sustainability will be improved.

Based on IEE, Consultants in FS stage, PPMU will suggest the functional authority to give approval of IEE for Upgrading of Du Du Reservoir subproject to create basis for next implementation steps, ensuring the implementation progress, effectiveness and benefits of the project./.

IEE/ CEP prepared by			
Signature:		***Signature:***	
Date:		***Date:***	

6. ANNEXES

- Current status of irrigation system and ambient environment
- Public consultation activities
- Data sources
- Environmental Monitoring Form
- Environmental Mitigation measures to include in bidding documents

Annex 1: Current status of irrigation system and ambient environment

Photo 1: Existing situation of Du Du Earth Dam

Photo 2: Eroded holes in downstream of Du Du Dam with depth >1m

Photo 3: Spillway still good working

Photo 4: Existing main canal to be upgraded

Some proposed environmental monitoring locations (Air /Noise monitoring and traffic disturb monitoring points)

Photo 5: Air quality monitoring & traffic monitoring point at Interchange point between main canal to be upgraded and NH 1A at Ham Cuong Commune

Photo 6: The main canal & management road need to upgrated

Annex 2. Public consultation activities

Public consultation contents

1. Participants: Safeguard policies consultants, local leaders (communal and district levels), affected households and other local people living near project area;

2. Objectives: Project disclosure and public consultation on potential environmental impacts and proper mitigation measures during project's implementation;

3. Meeting content

3.1. Safeguard policies consultants introduced on basic information on project, construction items and their parameters;

3.2. Main environmental impacts and their mitigation measures were defined as by safeguard policies consultants, including:

+ Environmental impacts, social impacts before construction, consist of popular impacts such as land occupy, plants and tree removal, UXO area determination and their mitigation measures;

+ Environmental impacts during construction implementation such as dust, noise, safety for transportation as well as safety for local people on traffic roads, other impacts on agricultural activities; water, soil pollution, etc. and their mitigation measures;

3.3. Collecting contribution from local people on other potential environmental impacts before construction implementation, during construction stage and on operation, maintenance stages;

3.4. Safeguard policies consultants introduced in general on Environmental System Management in Viet Nam that my be applied in this subproject such as responsibilities of DONRE, DARD, DPC, CPC, Construction Management Consultants, Contractors and especially local Community Environmental Management Board;

The details will be described in meeting minutes as written following. People's contribution on environmental impacts and mitigation measures were presented in detail at "Table 11. Public consultation results".

Meeting minutes at public consultation and lists of attendance in the public consultation meeting at Ham Cuong commune

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập – Tự do – Hạnh phúc

Hàm Thuận Nam, ngày 5 tháng 8 năm 2014

DỰ ÁN PHÁT TRIỂN NÔNG THÔN TỔNG HỢP

CÁC TỈNH MIỀN TRUNG - KHOẢN VAY BỔ SUNG

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG

Về các chính sách an toàn: Môi trường, Tái định cư, Giới và Dân tộc thiểu số

Tên tiểu dự án: Nâng cấp hồ chứa nước Du Dủ

Xã Hàm Cường huyện Hàm Thuận Nam tỉnh Bình Thuận

I. Thành phần tham dự:

- Ông/Bà Đỗ Thị Nhàm Chức vụ Chuyên gia Môi trường
- Ông/Bà Đoàn Văn Anh Chức vụ Chuyên gia Tái định cư
- Ông/Bà Ngô Thanh Liêm Chức vụ Chuyên gia DTTS
- Ông/Bà Lê Thị Hồng Phương Chức vụ Chuyên gia Giới
- Ông/Bà Ngô Hồng Phong Chức vụ CBĐ Ban QLDA tỉnh
- Ông/Bà Hồ Hữu Lợi Chức vụ PCT UBND xã
- Ông/Bà Võ Đình Chung Chức vụ PCT Hội Nông dân

- Đại diện những hộ bị ảnh hưởng ..... người, trong đó .....nữ, chiếm....(%) , Dân tộc thiểu số.....người, chiếm....%

II. Nội dung

2.1 Các nội dung phổ biến:

- Cung cấp các thông tin về dự án như địa điểm, quy mô, các thông số kỹ thuật cơ bản ....

- Chính sách an toàn của dự án bao gồm: Chính sách về giới và sự tham gia của cộng đồng; Kế hoạch hành động giới; Chính sách môi trường, Chính sách Tái định cư và kế hoạch phát triển người dân tộc thiểu số.

2.2 Tham vấn cộng đồng:

- Tham vấn các vấn đề giám sát và tham gia của cộng đồng trong các giai đoạn chuẩn bị, thực hiện, vận hành tiểu dự án, các vấn đề về giới và lồng ghép giới, nhóm dễ tổn thương, hộ bị ảnh hưởng nặng...

- Tham vấn các vấn đề về môi trường, tác động môi trường tiềm năng của dự án bao gồm tác động lên môi trường tự nhiên và xã hội của khu vực dự án và những biện pháp giảm thiểu các tác động tiêu cực;

- Tham vấn các vấn đề về tái định cư, các tác động dự kiến, quyền lợi của người bị ảnh hưởng, các biện pháp giảm thiểu tối đa nhằm có ít tác động nhất đến người bị ảnh hưởng.

- Tham vấn nhu cầu đào tạo của các hộ bị ảnh hưởng.

III. Ý kiến thảo luận

III.1.Các vấn đề về giới, tham gia cộng đồng

1) Tỷ lệ phụ nữ tham gia vào bộ máy chính quyền xã còn rất thấp so với nam giới. Các vị trí quan trọng đều do nam giới đảm nhận. Quản lý thủy lợi do HTX đảm nhận và đội 10 là nam giới.

2) Trong sản xuất phụ nữ có vai trò như nam giới, phụ nữ sản xuất thanh long, chăn nuôi và buôn bán kinh doanh. Tuy nhiên trong các lớp tập huấn nam giới được tham gia nhiều hơn phụ nữ và chính quyền và các ban liên quan làm việc với chủ hộ.

3) Phụ nữ đảm nhận đến 90% công việc gia đình và cộng đồng vẫn xem đó là công việc của đàn bà.

4) Vấn đề bạo lực gia đình, đôi lúc gia đình có xảy ra 40% mà nguyên nhân là nam giới hay nhậu nhẹt, lười lao động. Phụ nữ là nạn nhân.

III. 2. Các vấn đề về môi trường

- Các hộ dân mong muốn có được nước sạch cho sinh hoạt vì hiện tại phải mua nước để nấu ăn (20 - 50.000/m³ tùy xe - thôn Kiên).

- Nhà thầu cần chấp hành nghiêm chỉnh các biện pháp giảm thiểu bụi, ô nhiễm nguồn nước trong giai đoạn thi công.

- Cần thông báo KH thi công được biết lịch gđ thông cho quản lý, phục vụ sản xuất và ả/h đến đi lại của bà con trong xã.

III.3. Các vấn đề về tái định cư và dân tộc thiểu số

Qua tìm hiểu thực địa cho thấy, việc thực hiện dự án chỉ ảnh hưởng tạm thời đến một số diện tích nhỏ đất nông nghiệp của người dân.

Các hộ dân liên quan, qua tìm hiểu thực hiện dự án cần thiết, theo nguyện vọng của người BAH. Ngoài ra, các bên liên quan cũng thống nhất chủ trương thực hiện dự án.

Tại xã chỉ có một số hộ DTTS là người Hoa, là những hộ không BAH mà chỉ ảnh hưởng bởi thi công XD chỉ ấn.

IV. Kết luận

Các bên liên quan thống nhất chủ trương thực hiện dự án. Yêu cầu nhà thầu thi công sớm triển khai thi công công trình để người dân sớm được hưởng lợi.

Qua tìm thi công cần chú ý trong quá trình tập kết vật liệu, thi công để hạn chế mức độ ảnh hưởng đến việc canh tác của người dân.

Cuộc họp các bên thống nhất và kết thúc vào lúc .....ngày.....tháng.....năm 2014

Đại diện cộng đồng

Đại diện UBND xã

PHÓ CHỦ TỊCH

ĐỖ HỮU TRÍ

Đại diện Ban QLDA tỉnh

Đại diện tư vấn

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập – Tự do – Hạnh phúc

Hàm Thuận Nam, ngày 5 tháng 8 năm 2014

DỰ ÁN PHÁT TRIỂN NÔNG THÔN TỔNG HỢP CÁC TỈNH MIỀN TRUNG – KHOẢN VAY BỔ SUNG

DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP

(Tham vấn cộng đồng về chính sách an toàn: Môi trường, Tái định cư, Giới và Dân tộc thiểu số

Tên tiểu dự án: Nâng cấp hồ chứa nước Du Dủ.

Xã Hàm Cường, huyện Hàm Thuận Nam tỉnh .....

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên	Ghi chú
1.	Hồ Văn Thiệt	Nam	xã Hàm Cường		
2.	Đỗ Quốc Thuần	Nam	xã Hàm Cường		
3.	Phan Sỹ Lâm	Nam	xã Hàm Cường		
4.	Lê Văn Nhi	Nam	xã Hàm Cường	Nhi	
5.	Ng Văn Cải	Nam	" "		
6	Hoàng Hiệp Long	Nam	" "		
7	Đỗ Hữu Đài	Nam	" "		
8.	Ng Long	Nam	"		
9.	Võ Đình Chung	Nam	"		
10.	Trần Văn Biên	Nam	"		
11.	Dương Ngọc Hòa	Nam	"	Hòa	
12.	Ng Thanh Hùng	Nam	"		
13.	Trần Minh Tín	Nam	"	Tín	
14.	Ng Văn Phú	Nam	"		
15.	Trần Duy Phúc	Nam			
16.	Lê Hồng Sơn	Nam	"		

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên	Ghi chú
17	Võ T. Kim Phương	Nữ	xã Hàm Cường		
18	Ng T. Hoàng	Nữ	xã Hàm Cường		
19	Lê Thị Kim Phương	Nữ	" "		
20	Lê Thị Minh Châu	Nữ	"		
21	Huỳnh Thị Mỹ Phúc	Nữ	"		
22	Ng Vũ Kim Xoài	Nữ	"		
23	Huỳnh Thị Ngọc Hiền	Nữ	"		
24	Hoàng T. Diệu Linh	Nữ	"		
25	Lê T. Minh Thanh	Nữ	"		
26	Bùi Thị Anh	Nữ			
27	Phạm T. Kim Thuê	Nữ	"		
28	Ng Thị Xuân	Nữ	"		
29	Ng T. Kim Hậu	Nữ			
30	Ng Thị Nhỏ	Nữ			

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên	Ghi chú

Đại diện cộng đồng

Đại diện UBND xã

PHÓ CHỦ TỊCH

ĐỖ HỮU TRÍ

Đại diện Ban QLDA tỉnh

Đại diện tư vấn

Meeting minutes at public consultation and lists of attendance in the public consultation meeting at Ham Minh commune

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập – Tự do – Hạnh phúc

Hàm Minh, ngày 5 tháng 8 năm 2014

DỰ ÁN PHÁT TRIỂN NÔNG THÔN TỔNG HỢP CÁC TỈNH MIỀN TRUNG (Loan 2357-VIE)

BIÊN BẢN LÀM VIỆC

Hôm nay, ngày 5 tháng 8 năm 2014, tại xã Hàm Minh chúng tôi gồm:

I. Đại diện nhóm tư vấn của dự án Phát triển nông thôn tổng hợp miền Trung:

- Ông/Bà: Đỗ Thị Nhàn Chức vụ: Tư vấn - Môi trường
- Ông/Bà: Đoàn Văn Định Chức vụ: Tư vấn Tái định cư
- Ông/Bà: Lê Thị Hồng Phương Chức vụ: Tư vấn Giới.

II. Đại diện Ban QLDA tỉnh

- Ông/Bà: Nguyễn Hồng Thường Chức vụ: Cán bộ Ban QLDA tỉnh
- Ông/Bà: ..... Chức vụ: .....
- Ông/Bà: ..... Chức vụ: .....

III. Đại diện địa phương

- Ông/Bà: Lê Văn Chí Chức vụ: CT UBND xã
- Ông/Bà: Ngô Thanh Liêm Chức vụ: CB Địa chính
- Ông/Bà: Ngô Thị Thanh Thúy Chức vụ: CT Hội phụ nữ

Nội dung làm việc:

Đại diện ban QLDA tỉnh giới thiệu chương trình làm việc.

Tư vấn thiết kế giới thiệu nội dung cơ bản của dự án thành phần hồ chứa nước Du Du.

Tư vấn Môi trường trình bày giới thiệu nội dung liên quan đến vấn đề môi trường, Giới, phát triển cộng đồng và Tái định cư.

Đại diện lãnh đạo xã và người dân tham gia góp ý và trả lời tham vấn.

Sau khi đọc lại biên bản, những người có mặt đồng ý về nội dung biên bản, không có ý kiến gì khác.

Đại diện Ban QLDA tỉnh

Ng Ngọc Hồng Thắng

Đại diện UBND xã

CHỦ TỊCH

LÊ VINH CHÍ

Đại diện tư vấn

Đoàn Văn Đức

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập – Tự do – Hạnh phúc

Hàm Minh, ngày 5 tháng 8 năm 2014

DỰ ÁN PHÁT TRIỂN NÔNG THÔN TỔNG HỢP

CÁC TỈNH MIỀN TRUNG - KHOẢN VAY BỔ SUNG

BIÊN BẢN HỌP THAM VẤN CỘNG ĐỒNG

Về các chính sách an toàn: Môi trường, Tái định cư, Giới và Dân tộc thiểu số

Tên tiểu dự án: Nâng cấp hồ chứa nước Du Dủ

Xã Hàm Minh, huyện Hàm Thuận Nam tỉnh Bình Thuận

I. Thành phần tham dự:

- Ông/Bà Đỗ Thị Nhâm, Chức vụ Chuyên gia Môi trường
- Ông/Bà Lê Thị Mộng Phương. Chức vụ Chuyên gia Giới.
- Ông/Bà Đoàn Văn Định Chức vụ Chuyên Gia Tái định cư
- Ông/Bà Ng Hồng Trường Chức vụ Chuyên viên Ban QLDA thủ
- Ông/Bà Lê Minh Chí, Chức vụ CT UBND xã
- Ông/Bà Nguyễn Thanh Hằng Chức vụ CB Địa chính
- Ông/Bà Ng Thị Thanh Thủy. Chức vụ CT Hội phụ nữ

- Đại diện những hộ bị ảnh hưởng ..... người, trong đó .....nữ, chiếm....(%) , Dân tộc thiểu số.....người, chiếm....%

II. Nội dung

2.1 Các nội dung phổ biến:

- Cung cấp các thông tin về dự án như địa điểm, quy mô, các thông số kỹ thuật cơ bản ....

- Chính sách an toàn của dự án bao gồm: Chính sách về giới và sự tham gia của cộng đồng; Kế hoạch hành động giới; Chính sách môi trường, Chính sách Tái đinh cư và kế hoạch phát triển người dân tộc thiểu số.

2.2 Tham vấn cộng đồng:

- Tham vấn các vấn đề giám sát và tham gia của cộng đồng trong các giai đoạn chuẩn bị, thực hiện, vận hành tiểu dự án, các vấn đề về giới và lồng ghép giới, nhóm dễ tổn thương, hộ bị ảnh hưởng nặng...

- Tham vấn các vấn đề về môi trường, tác động môi trường tiềm năng của dự án bao gồm tác động lên môi trường tự nhiên và xã hội của khu vực dự án và những biện pháp giảm thiểu các tác động tiêu cực;

- Tham vấn các vấn đề về tái định cư, các tác động dự kiến, quyền lợi của người bị ảnh hưởng, các biện pháp giảm thiểu tối đa nhằm có ít tác động nhất đến người bị ảnh hưởng.

- Tham vấn nhu cầu đào tạo của các hộ bị ảnh hưởng.

III. Ý kiến thảo luận

III.1.Các vấn đề về giới, tham gia cộng đồng : 1) Tỷ lệ phụ nữ tham gia vào bộ máy chính quyền cấp xã thấp hơn nam giới, các vị trí lãnh đạo do nam giới đảm nhiệm vì thế tiếng nói của phụ nữ trong gia đình ra quyết định còn hạn chế. 2) Phụ nữ và nam giới có vai trò như nhau trong sản xuất, do thiếu nước tưới, do đường giao thông nội đồng sản xuất chủ yếu là đường đất cho nên phụ nữ còn phải gặp khó khăn trong việc vận chuyển vật liệu, thanh long và vì thế chi phí vận chuyển cao. 3) Phụ nữ có thời gian làm việc nhiều hơn nam giới vì phụ nữ đảm nhiệm gồm cả công việc gia đình. Phụ nữ là lao động phụ khó và cũng có nước sạch.

Vấn đề: Yêu cầu nhà thầu hợp đồng để lập kế hoạch thi công làm sao cho không ảnh hưởng đến việc đi lại, vận chuyển hàng hoá và cung cấp nước cho các hộ

III. 2. Các vấn đề về môi trường

— Nhất trí với đề xuất của TDA & mong dự án sớm thực hiện.

— Cần thực hiện biện pháp giảm thiểu bụi & tiếng ồn khi nâng cấp tuyến đường quản lý & phục vụ sản xuất, đặc biệt lưu ý khi đào đắp, gây ảnh hưởng đến đời sống người dân và bụi ảnh hưởng đến cây thanh long.

— Cần đảm bảo giao thông đi lại, tránh ảnh hưởng đến việc vận chuyển thanh long, phải hoàn chỉnh sửa chữa đường (ngay sau giai đoạn thi công) để tránh ảnh hưởng đến các xe tải thu mua vận chuyển thanh long.

— Nhà thầu cần tuân thủ các biện pháp bảo vệ môi trường như đã cam kết trong báo cáo ~~IEE~~ ĐTM hoặc cam

III.3. Các vấn đề về tái định cư và dân tộc thiểu số

Các bên tham gia thống nhất chủ trương thực hiện dự án.

Việc tiến hành thực hiện dự án chỉ tác động tạm thời đến đất nông nghiệp hoặc một số hàng nhỏ cây cối của người dân.

Lãnh đạo xã và các hộ dân yêu cầu các bên liên quan thực hiện theo đúng những quy định liên quan, nhằm đảm bảo quyền lợi cho các hộ bị ảnh hưởng.

Các hộ dân yêu cầu nhà thầu cần thông báo với người dân về thời gian thi công công trình nhằm tác động ở mức thấp nhất.

IV. Kết luận

Người dân đều mong muốn dự án thực hiện, và đang giá cao hiệu quả của dự án.

Người dân cũng mong muốn được tham gia vào dự án, được nhà thầu mời làm việc để có thêm việc làm và thu nhập.

Trong quá trình thực hiện mong muốn nhà thầu chấp hành tất cả quy định về môi trường nhằm hạn chế ô nhiễm về bụi, tiếng ồn.

Nhà thầu thực hiện dự án đúng tiến độ, cùng người dân bàn bạc để có được kế hoạch thi công được, cũng nhưng nâng tiến làm sao cho không ảnh hưởng đến việc vận chuyển hàng hóa, vật liệu và cung cấp nước cho các hộ

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập – Tự do – Hạnh phúc

Hàm Minh, ngày 5 tháng 8 năm 2014

DỰ ÁN PHÁT TRIỂN NÔNG THÔN TỔNG HỢP CÁC TỈNH MIỀN TRUNG – KHOẢN VAY BỔ SUNG

DANH SÁCH ĐẠI BIỂU THAM DỰ CUỘC HỌP

(Tham vấn cộng đồng về chính sách an toàn: Môi trường, Tái định cư, Giới và Dân tộc thiểu số

Tên tiểu dự án: Nâng cấp hồ Du Du

Xã. Hàm Minh, huyện Hàm Thuận Nam, tỉnh Bình Thuận

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên	Ghi chú
1	Nguyễn Quốc Thanh	Nam	Hàm Minh		
2	Nguyễn Bá Lợi	"	"		
3	Đào Văn Tới	"	"		
4	Cao Đình Phước	"	"		
5	Trần Văn Hòa	"	"		
6	Trần Văn Huy	"	"		
7	Hồ Gia Bình	"	"		
8	Nguyễn Văn Em	"	"		
9	Nguyễn Thanh Phong	"	"		
10	Đào Văn Viễn	"	"		
11	Nguyễn Thanh Tùng	"	"		
12	Bùi Thanh Mang	"	"		
13	Nguyễn Ngọc Sáu	"	"		
14	Cao Khải Minh	"	"		
15	Ngô Văn Ca	"	"		
16	Ngô Thanh Dương	"	"		

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên	Ghi chú
1	Vũ Thị Hằng Thư	Nữ	Hàm Mỹ		
2	Huỳnh T. Lệ Cúc	"	"		
3	Châu Thị Kim Huệ	"	"		
4	Lê Thị Tín	"	"		
5	Vũ Thị Xuân Mỹ	"	"		
6	Ng Thị Thanh Thúy	"	"		
7	Mai Thị Hường	"	"		
8	Huỳnh Thị Các	"	"		
9	Trần Thị Phương	"	"		
10	Lê Thị Thuận	"	"		
11	Hồ Mỹ Lợi	"	"		
12	Vũ Thị Thanh Vân	"	"		
13	Ng Thị Hoà	"	"		
14	Huỳnh Thị Hoa	"	"		
15	Lê Thị Trâm	"	"		

STT	Họ và tên	Giới tính	Địa chỉ	Ký tên	Ghi chú

Đại diện cộng đồng

Đại diện UBND xã

CHỦ TỊCH

LÊ VINH CHI

Đại diện Ban QLDA tỉnh

Đại diện tư vấn

Đoàn Văn Anh

Photos of public consultation meetings

Photo 7: Public consultation in Ham Cuong commune – Ham Thuan Nam District , Morning 5 Aug 2014

Photo 8: Public consultation in Ham Minh commune-Ham Thuan Nam District , 5 Aug 2014

Annex 3. Data source

1- SIR – Upgrading of Du Du reservoir subproject, Binh Thuan province

2- Annual statistic data, Ham Thuan Nam district; 2013;

3- Environmental Monitoring data for Air quality, water quality in the subproject area 2013, Binh Thuan Province's Center of Observation and Environmental Analysis, Data collection from beneficiary communities in the years of 2013.

Annex 4: Environmental monitoring forms

Environmental Compliance Monitoring Form for Construction Package

Part A: General Project Information

Subproject Name:_____

SIR Code:_____ Subproject Package #:_____ Activity Sector:_____

Province:_____ Districts: _____

Design and Supervision Consultant Firm:_____

Construction Company Name:_____ Contract Date: _____

Contract Amount:_____ Contract Duration (days)_____

Person Responsible: _____ Phone _____

PPMU EMO:_____ Phone _____

Part B: Monitoring checklist

Performance Indicator 1. Design and Preparations

The PPMU to complete 1-4 in conjunction with the subproject design consultant at the time the project is tendered. Date of Monitoring:_____

	Yes	No	Remarks
1. Have all UXO been cleared prior to commencement of construction?			
2. Does the subproject design meet applicable engineering safety and public health standards?			
3. Have the resettlement provisions been disclosed to the affected communities and compensation made to affected persons or households?			
4. For the applicable subproject type:			
a. Roads, embankments, irrigation works and coastal protection: does the design provide cross drainage to prevent flooding?			
b. Markets: does the design provide washing facilities and toilets in the market area?			

The construction Supervision consultant (CSC) to complete 5-10 with the PPMU and construction contractor at the time of start-up. Date of Monitoring:_____

5. Has the contractor prepared a Site EMP?			
6. Has the contractor posted a public notice regarding the nature, extent and cost of the project?			
7. Are locations for mixing plants sufficiently distant from houses, schools and hospitals?			
8. Are agreements in place with owners for temporary use of land for worker camps and construction yards?			
9. Have spoil disposal sites been selected in consultation with local authorities?			
10. Are official permits on record for quarry sites and borrow pits?			
Score (1-10; 10 total)			(%)

Performance Indicator 2. Worker Provisions

The CSC to complete 11-16 in conjunction with the PPMU and construction contractor following commencement of construction. Date of Monitoring:_____

	Yes	No	Remarks
11. Were local authorities consulted in the planning for the location of construction worker housing?			
12. Are supervisors or other site personnel trained in basic first aid emergency response measures?			
13. Are first aid kits readily available to workers at the job site along with instructions for use?			
14. Has the contractor or Inspector from the Department of Health undertaken an awareness program for communicable diseases/HIV-AIDS?			
15. Has the contractor provided safety equipment (hard hats, ear plugs, dust masks, safety boots and glasses) to workers and training in use?			
16. Are construction camps equipped with adequate water supply, sanitary toilets, washing facilities and facilities for waste collection and storage?			
Score (11-16; 6 total)			(%)

Performance Indicator 3. Biodiversity

The CSC should complete 17-21 in conjunction with the PPMU and construction contractor following commencement of construction. Date of Monitoring:_____

	Yes	No	Remarks
17. Does the project avoid encroaching on natural forests or wetlands?			
18. Does the project avoid adverse effects on flow of natural streams and water quality?			
19. Are worker camps located outside of forested areas and has the contractor restricted access of workers to forests, fishing and hunting?			
20. Does the contractor obtain fill materials only from pre-existing quarries, or from borrow pits within the strict limits of the construction zone?			
21. For irrigation sector projects, are effects on agricultural biodiversity limited through use of integrated pest management?			
Score (17-21; 5 total)			(%)

Performance Indicator 4. Community Based Monitoring

The CSC to complete 22 and 23 in conjunction with the PPMU and construction contractor following commencement of construction. Date of Monitoring:_____

	Yes	No	Remarks
22. Has the contractor posted a public notice regarding complaints from the community?			
23. Has there been a public consultation regarding construction, environmental impact, and the community complaints system?			
Score (22-23; 2 total)			(%)

Outcome of Public Consultation:

Date: _____ Location: _____

Topics covered in presentation: _____
_____

Comments from Attendees:

Performance Indicator 5. Community Values and Safety

Items 24 – 35 should be inspected quarterly. Date of Monitoring:_____

	Yes	No	Remarks
24. Is temporary access provided to adjacent properties as needed?			
25. Is permanent access to adjacent properties reinstated on completion of a segment of work?			
26. Are construction hours adjusted around houses, hospitals and schools to minimize disturbance?			
27. Does the contractor limit the scope of construction in progress to minimize community impacts?			
28. Are physical impacts on public infrastructure and service disruption minimized?			
29. Are materials transported on approved haul routes?			
30. Are construction equipments maintained in good condition?			
31. Do vehicles operate within legal speed limits?			
32. Are material loads traveling on public routes covered?			
33. Is dust suppressed by watering exposed surfaces?			
34. Has the contractor installed signs and lighting in vicinity of works on public roads?			
35. Is access to the construction site restricted to the public?			
Score (24-35; 12 total)			(%)

Performance Indicator 6. Hydrology/Water Pollution

Items 36 – 43 should be inspected quarterly. Date of Monitoring:_____

	Yes	No	Remarks
36. Are construction camps maintained in a clean and hygienic condition?			
37. Are oil, fuel and chemicals stored in enclosed areas (dyked or covered)?			
38. Is discharge of wastewater into water bodies used for water supply avoided?			
39. Is clearing activity suspended during rains?			
40. Does the contractor prevent discharge of concrete trucks to waterways?			
41. Have existing drainage patterns been maintained during construction?			
42. Are areas of standing water in the construction area drained and backfilled?			
43. Are sediment controls installed upslope of waterways?			
Score (36-43; 8 total)			(%)

Performance Indicator 7. Project Completion

Items 44 – 50 should be inspected prior to finalizing the construction works. Date of Monitoring:_____

	Yes	No	Remarks
44. Have drainage fixtures, curbs, road shoulders and ditch slopes been finished out to prevent hazard to the public during use?			
45. Are ground surfaces in the project area graded to prevent water from collecting?			
46. Have all construction debris, tree cuttings, excess dirt, rubble and scrap been removed from the construction zone?			
47. Have all pits been filled in and graded to drain, underground tanks (including septic tanks) removed and holes backfilled?			
48. Are all waste products removed from the construction site, equipment yards and worker camps, including oil waste, scrap materials and equipment, building materials and domestic waste?			
49. Have all points of access (drives, walks) and utilities (water supply, power, communications) to public and private property been restored to original condition?			
50. Have all complaints by the local community and individuals been resolved by the Contractor?			
Score (44-50; 7 total)			(%)

Performance Tracking

Performance Tracking consists of three sections:

a. Performance Follow-up, where performance shortfalls noted in prior monitoring are listed and checked against current monitoring results.

b. Community Complaints, where issues raised by the affected community are registered, tracked and outcomes recorded.

c. Performance Indicator Results, where environmental performance against indicators are recorded.

Section 1: Performance Follow-up

Column 1	Column 2	Column 3	Column 4	Column 5
Performance variable (#) / Date Observed	Reason for negative rating	Was agency responsible notified? / Date	Was problem corrected before next monitoring?	Was performance indicator adjusted?

Section 2: Community Complaints

Column 1	Column 2	Column 3	Column 4	Column 5
Person Registering Complaint / Date	Summary of Complaint	Was agency responsible notified? / Date	Was problem corrected before next monitoring?	Was Person satisfied with Action?

Section 3: Performance Indicator Results

Project Name:_____ SIR No.:_____ Package #:_____Province:_____

Project Start Date:_____

	Startup	Rev.	Q1	Q2	Q3	Q4	Average	Completion	Rev.	Final
Recording Date:										
1. Design and Preparations										
2. Worker Provisions										
3. Biodiversity										
4. Community Based Monitoring										
5. Community Values / Safety										
6. Hydrology/Water Pollution										
7. Project Completion										

Submittal Date:_____ For Calendar Quarter: _____

Inspector:_____

(Signature)

Annex 5:

Environmental mitigation measure to include into bid documents Du Du Subproject

Sub-project Activity	Potential impacts	Proposed Mitigation Measure
Earthworks Concrete embankment Waste and material transportation	Noise and vibration generation	▪ Use modern and new construction machines and equipment to meet standards of exhaust, noise, and vibration as regulated by the Government. The Contractor needs to submit the Engineer documents proving that all construction vehicles, equipment, and machines are checked and meet requirements concerning noise and vibration generation of the current Vietnam standards as QCVN 26: 2010 for noise level and QCVN 27:2010 for vibration emitted by construction works; ▪ All noise and vibration generation activities shall be restricted to the hours of 22h – 6h and not to be undertaken on Sundays or public holidays at the location nearby residential area such as: ▪ Residential areas in Ham Minh, Ham Cuong Communes- Ham Thuan Nam District ▪ Regularly maintenance of construction machines. ▪ Provision noise protection equipment for worker; ▪ In case that, noise generation equipment need to run during night time and holiday time nearby the above sensitive objects, the detail schedule will be considered and approved by SC before could be applied. ▪ Local communities must be informed about construction schedules and time through informal public consultation or any local people meetings and notice board; ▪ Strictly implementing noise control measures as noted above through sampling and taking adequate corrective actions if needed
	Dust and exhaust generation	▪ All excavated soil should be reused for levelling low areas where applicable such as excavated soil could be used for levelling existing sites for construction of access road surface. ▪ Excavation at site will be watered to maintain certain moisture levels, and to prevent or minimize dust dispersion. The watering activities have been proposed at least one per day during dry season in the residential areas, such as residential area in Ham Minh and Ham Cuong Communes ▪ The construction machineries and equipment have to comply with Decision No. 249/2005/QĐ-TTg dated 10/10/2005 of Prime minister, Regulation on Emission roadmap for road transportation vehicles ▪ Cover the material storage, setting up appropriate of mobilize material to the site to ensure that material will not obstruct at the site and release dust; ▪ All material/waste storage shall be located at least 50 meters from any households and sensitive areas as mentioned above. ▪ Trucks carrying construction waste are covered. All trucks used should have well fitted bodies and not be overtopped in loading to avoid soil scattering. Excavated sludge will be transported by specialized vehicles. ▪ Speeds shall be limited when the trucks pass residential areas to constrain dust flying in the wind which affect health and daily activities of the people living along the roads. The certain section

Sub-project Activity	Potential impacts	Proposed Mitigation Measure
		route will be identified by SPC. Speed limitation signs shall be adequately installed within construction site and its regulation shall be remind to each driver by contractor. ▪ Soil scattered on the paved road and public road shall be removed immediately.
Sludge excavation, Worker camp establishment, Waste generation	Odour generation and in-sanitation condition	▪ Excavation activities must be carefully scheduled to avoid the rainy season in order to ensure drainage of runoff water as well as sanitation for both local residents and workers; ▪ It is strong recommended that any intervention actions on the channels, it should be dewatered and dried before implementing excavation activities to reduce odour generation and in-sanitation condition and avoid polluting surface water quality. ▪ Construction waste need to be transported by adequate manners to use for levelling purpose at low area in Ham Minh and Ham Cuong Commune ▪ Domestic waste and garbage from construction site will be collected by hygienic manner. ▪ Disposal of solid wastes into canals, stream, other watercourses, agricultural field and public areas shall be prohibited. ▪ Burning of construction and domestic wastes shall be prohibited. ▪ Toxic waste, if any, need to be collected, transported and treated according to the Circular No. 12/2011-BTNMT dated on 14/04/2011 of MONRE. ▪ Excavated sludge will be transported by specialized vehicles to avoid the leaking out of sludge on the transport routes. ▪ Before the construction activities completed, contractors have to carry out site clearance and environmental recovery, such as: + Transport of all unused materials from the site; + Remove all construction machine and equipment, temporary facilities, worksites; + Environmental recovery at the site such as provision of green trees, grass in both construction sites and disposal location in Ham Minh and Ham Cuong Commune
Excavate activities and worker camp establish on sites…	Water quality impacts	▪ Worksite, camps, material storage areas and load/unload construction material/waste activities must be located far from watercourse to ensure that materials will not be disposed into water, ▪ Excavation activities of drain items must be scheduled to avoid rainy to reduce suspended maters in runoff water entering the surrounding water bodies and existing canals; ▪ Provide adequate facilities in the site including latrines, holding areas and garbage cans. Waste from latrines will be collected and treated properly through an economic contract with local environmental co-operatives/companies. ▪ Cover material storage areas when raining is needed. Temporary storage of construction and domestic waste on the sites will be no longer than 24 hours. ▪ The placement of washing instruments/vehicles next to the water bodies, existing canals (identified in Water quality impact section) will not allowed avoiding the leaching of waste, sludge, soil and oil contaminated water and maintenance activities will be banned on the sites in all construction drains; ▪ Equipping the dustbins and mobility septic tanks to work sites ((it is proposed that there will be 1 dustbin and 1 mobility septic

Sub-project Activity	Potential impacts	Proposed Mitigation Measure
		tank for each site)
Inappropriate soil pit practices and concrete station operation	Soil erosion, vegetation clearance and run off water at soil pit	- Prioritize the use of existing soil pit sites with suitable materials and update the list of soil pit monthly and report to PPMU and minimize impacts on other local resources; - Procure materials only from DONRE authorized soil pit and borrow sites; - Extraction of sand and gravel in river beds shall be prohibited except: (i) where this is no technically and economically feasible alternatives and (ii) provided specific mitigation measures are implemented to minimize impact on river morphology, water quality (e.g., turbidity) and aquatic ecosystems (e.g., reduced extraction during fish spawning period); - Checking the environmental protection commitment documents of soil pit, asphalt concrete stations since the Project will purchased construction material and hot concrete from these areas; - Monitoring the implementation of environmental protection measures at the soil pit and concrete stations; - Supervision the responsibility of environmental recovery activities at the soil pit areas and concrete stations.
Inappropriate construction waste management	Sludge and waste water spreading to surrounding cultivation area as well as air pollution to ambient environment	▪ All solid waste should be reused for levelling low areas where applicable; ▪ Construction waste shall to be transported by adequate manners to places under permission from Commune authorities in Ham Minh and Ham Cuong Communes and dumped at local peoples gardens ▪ Equip dustbins to work sites (it is proposed that there will be 1 dustbins provided at each construction site) ; ▪ Domestic waste and garbage from worker camps need to be collected by hygienic manner through survive provision of Ham Cuong and Ham Minh environmental co-operative; ▪ Disposal of solid wastes into canals, stream, other watercourses, agricultural field and public areas shall be prohibited; ▪ Burning of construction and domestic wastes shall be prohibited; ▪ Toxic waste, if any, need to be collected, transported and treated according to Circular No. 12/2011-BTNMT dated on 14/04/2011 of MONRE ▪ Before construction is completed, the contractor will move all construction wastes and unused materials from the site; ▪ Providing environmental protection measures at the soil disposal location include levelling, temporary drainage during rainy time, boundary edge provision, plantation and environmental recovery.
Use of hazardous substances and hazardous waste disposal	Air, soil and water contamination	▪ The storage area for all hazardous substances are located away from any water bodies in the project area such as irrigation canals, ponds… to avoid the leakage to water bodies ▪ Ensure that safe storage of fuel, other hazardous substances are agreed by PMU and have necessary approval/permit from DONRE and local authorities; ▪ Equipment/vehicle maintenance and refuelling areas will be confined to areas in construction sites designed to contain spilled lubricants and fuels; ▪ Fuel and other hazardous substances shall be stored in areas

Sub-project Activity	Potential impacts	Proposed Mitigation Measure
		provided with roof as stated in TCVN 5507:2002- *Hazardous chemicals − Code of practice for safety in production, commerce, use, handling and transportation*; ▪ Segregate hazardous wastes (oily wastes, fuel drums) and ensure that storage, transport and disposal shall not cause pollution; ▪ Ensure all storage containers are in good condition with proper labelling; ▪ Collected, transported and treated by contract with company which has a work permit for treating hazardous waste disposal according to the Circular No. 12/2011/TT-BTNMT on 14 April, 2011 of MONRE.
Transport vehicle activities Construction machinery operation Worker concentration	Community Disturbance and Traffic safety	▪ Place sign boards near construction sites to direct traffic means to slow down at the section close to Work site : ▪ Regulating the transport vehicle speed will not be over 20km /hour when passing above areas; ▪ Construction materials shall be stored tidily at the required locations. ▪ Inform the community about construction schedule through informal public consultation or any local people meetings and notice board;
.Poor management at worksites	Health and safety for the construction workers and the nearby community	▪ Constructor need to work with CS, PMU to establish labour safe regulations on the sites required by law and by good engineering practice, which include: electric safety, operating equipment - general safety requirements, general safety requirements. ▪ Workers shall be provided with appropriate personal protective equipment (PPE) such as safety shoes, hard hats, safety glasses, ear plugs, gloves, etc. at no cost to the employee.. ▪ 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 ▪ It is mandatory for workers to attend training courses on labour safety before they are recruited to work for the project; ▪ Supervise period on compliance to labour safe measures of workers at project sites. ▪ Contractors ensure to provide safe drinking water to workers for daily uses. ▪ Construction site shall be provided with toilet/sanitation facilities ▪ Contractor shall readily provide and maintain lights, protection fences, signboards and wardens where necessary as requested by the Engineer or local authorities.
Excavation, transport activities	Impacts to public facilities	▪ Obtain the agreement with local authorities in using the transport routes, intervening the canals and if any downgraded observations due to project activities have been found, the contractors have to fully compensate; ▪ Providing the temporary irrigation canals or drainage canals during construction phases if any interventions will be made on these canals; ▪ Consultation and obtain the agreement from local authorities and local peoples on replacement of all affected canals on the fields; ▪ Record the status of the existing roads and canals before construction and make proper compensation for the damages if

Sub-project Activity	Potential impacts	Proposed Mitigation Measure
		any. ▪ All public facilities should be fully compensated as its origin after completion of construction works;
Earthworks and excavation activities	Impacts on surrounding agricultural land and infrastructure	▪ No construction materials and/or wastes fall into agricultural land; ▪ Providing the temporary irrigation canals or drainage canals during construction phases if any interventions will be made on these canals to ensure the water flows on all cultivation areas; ▪ Appropriate management of water pollution sources from construction activities to ensure that the construction will not pollute water and soil on all cultivation areas; ▪ Reinstate road surface and fix up damages caused to irrigation canals, water supply/drainage canals; ▪ All activities of contractor only allow within the acquired land areas.
Construction activities Concentration of workers and equipment	Social disturbance	▪ Excavated pond will be dewatered and fenced to reduce high risk for local peoples; ▪ Construction materials shall be stored tidily at the required locations. ▪ Install barriers (temporary fence) at construction areas to deter people access to the site. ▪ The local people shall not be allowed in high-risk areas (excavation sites and areas where heavy equipment is in operation) . ▪ Remain the light during the nigh time on all construction sites. ▪ Construction workers who are not local people must register temporary residents and obtain temporary residential certificate from local authority. ▪ Educate workers on appropriate behaviour for interactions with local community and risks of communicable diseases
Obstructed drainage water flow	Localized flooding and insanitation condition	▪ Setting up appropriate construction schedule at the site to avoid rainy season, especially for excavation activities; ▪ Provision supplemental temporary drainage plans in the construction site to ensure the quickly respond in case of heavy rain, other unforeseen drainage issues and avoid obstructing water in surrounding areas and construction sites; ▪ Providing the temporary irrigation canals or drainage canals during construction phases if any interventions will be made on these canals to ensure the water flows; ▪ Supplemental temporary drainage plans must be revised and approved by PMU, and Construction Supervision before construction works started.
All construction activities	Cultural heritage impacts	▪ Where grave is found during construction, coordinate with local authorities to arrange for relocation and mapping the location of the graves before and after relocation; ▪ Halt construction activities, protect the site and inform construction supervision for guidance if artifacts are found at construction site.
Environmental recovery	Odour generation, unsafety and sanitation condition to	Before construction is completed, the contractor will move all construction wastes and unused materials from the sites to approved sites Monitoring environmental recovery at:

Sub-project Activity	Potential impacts	Proposed Mitigation Measure
	local people	▪ Construction waste disposal location ▪ Material soil pit and borrow areas ▪ Working sites Reinstate and ensure good condition for any effected public facilitates .